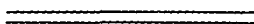


The Journal

of the

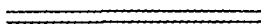
American Pharmaceutical Association



INDEX TO VOLUME XXIV

INDEX TO AUTHORS

INDEX TO SUBJECTS



JANUARY TO DECEMBER, 1935

THE ADMINISTRATION BUILDING OF THE PUBLIC HEALTH SERVICE *

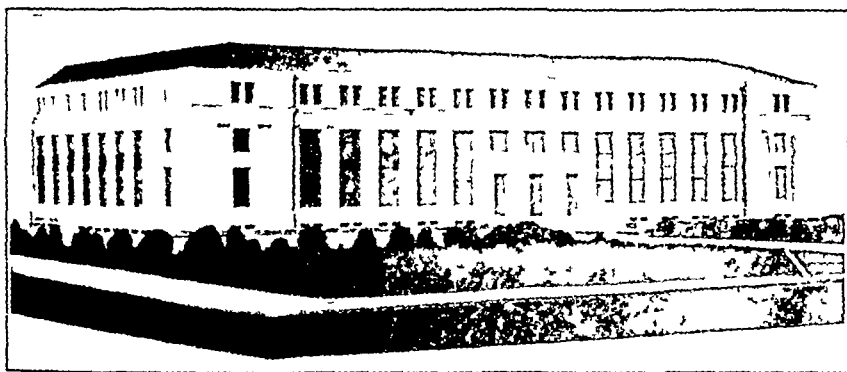
"The United States Public Health Service dates almost from the very beginning of our national history. It had its origin in a law enacted by the Federal Congress in 1798, which established the marine hospitals to provide relief and maintenance for sick and disabled American seamen. This was an important step in furthering the development of a great merchant fleet and the expansion of American commerce. Some of these hospitals cared for officers, sailors and prisoners wounded in naval engagements of the War of 1812."

The following is a very brief, general outline of the activities of the Public Health Service in fulfilling its important duties and responsibilities in protecting the health of the people:

Control of maritime quarantine, examination of immigrants, and inspection of passengers and crews of vessels and airplanes arriving from foreign ports, to protect the country from the importation of dangerous communicable diseases.

Control of interstate quarantine and health matters involved in interstate traffic to prevent the spread of communicable diseases between the States.

Study of the cause and means of propagation and spread of diseases of mankind, and the development of methods of prevention and control. In this work the Public Health Service maintains



Bureau of the Public Health Service—Administration Building

several research laboratories, the most important of which is the widely known National Institute of Health in Washington, D. C.

Supervisory control and licensing of the manufacture of biological and analogous products used in the prevention and treatment of diseases, to insure safe and standard products. These include the various vaccines, serums, antitoxins, arsenicals and similar preparations.

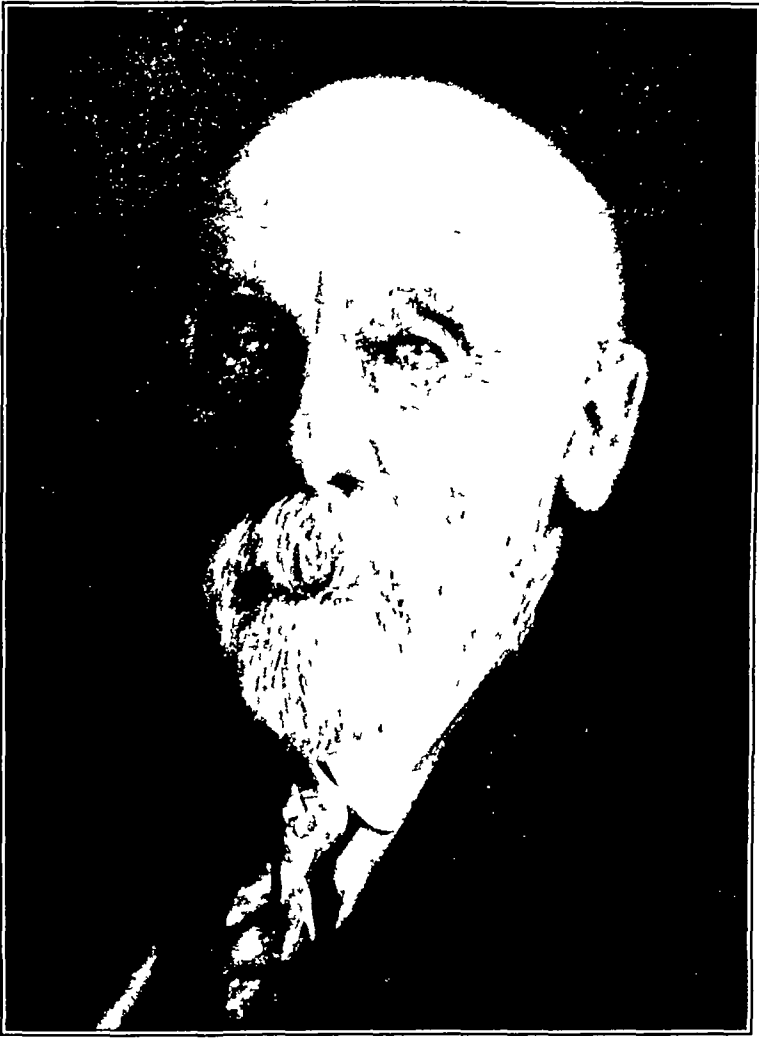
Study of mental diseases and drug addiction and the investigation of legitimate needs for narcotics.

Coöperation with State and local health departments, upon request, in all matters pertaining to public health.

Collection and publication of reports of disease prevalence in the United States and foreign countries, and compilation and publication of State laws and regulations and of court decisions relating to public health. Public health education and the dissemination of public health information.

"The affairs of the Public Health Service are administered by the Surgeon General and assistant surgeons general in charge of administrative divisions located in the Administration Building in Washington, D. C. On July 1, 1933, the personnel consisted of a total of 4911 persons. These include physicians, dentists, pharmacists, nurses, dietitians, laboratory technicians and other employees—a small army of trained personnel whose work is protecting the health and lives of the people of the United States. The career officers of the Public Health Service are commissioned by the President and they constitute a mobile sanitary corps whose members are available for service anywhere in the United States or foreign countries. Such a mobile corps is indispensable for the control of epidemics, quarantine duty and the prosecution of investigative studies."

* Third building east of the American Institute of Pharmacy on Constitution Ave., Washington, D. C.



DR FRED B KILMER

JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

VOL XXIV

JANUARY, 1935

No 1

F B KILMER WILL SETS UP PRIZES FOR PHARMACY

The will of Frederick Barnett Kilmer, filed for probate January 12th, includes bequests to the American and New Jersey Pharmaceutical Associations for prizes for meritorious work. Provision for the prize to be awarded by the AMERICAN PHARMACEUTICAL ASSOCIATION was made in a \$3000 trust fund, the income of which is to be applied by the ASSOCIATION to the rewarding of meritorious work in pharmacognosy. A fund of \$1000 was set aside for the New Jersey Pharmaceutical Association, the income to be awarded annually to the author of the best paper submitted to the association by a graduate pharmacist.

Mr Kilmer also left a \$5000 fund to St Peter's General Hospital, in New Brunswick, to perpetuate the nurses' library founded there in honor of Joyce Kilmer. Christ Episcopal Church in New Brunswick will receive \$1000 to be applied with other funds to the erection of a memorial to the Rev E B Joyce, former rector of the Church, and the income from a \$2000 fund for the preservation of historical data connected with Christ Church. Books and manuscripts in Mr Kilmer's library, which were written by his son, were left to Rutgers University, and other books, mostly scientific in nature, were left to the Philadelphia College of Pharmacy and Science, to St Peter's General Hospital, New Brunswick, and to the residuary legatees, all of whom are members of the family.

EDITOR'S NOTE Mr Kilmer became a member of the AMERICAN PHARMACEUTICAL ASSOCIATION in 1886. He was deeply interested in the Section on Historical Pharmacy, and in recent years the articles he contributed to the ASSOCIATION dealt with historical subjects.

Mrs Kilmer died December 31, 1931, a brief sketch may be found in the January JOURNAL, 1932, page 93, and a notice of Dr Kilmer's death appears in this issue of the JOURNAL.

EDITORIAL

E G EBERLE, EDITOR

2215 Constitution Ave , WASHINGTON, D C

THE NEW YEAR

LIFE is kaleidoscopic, it is ever changing—that is true under all conditions and situations and more so when affairs have been shaped so that some radical changes and directions seem necessary. The call is for master minds, seriously directed, not only to correct but watchful that the direction may be toward a betterment of a greater number. One of the evidences of life is that man is not ready to apply the Golden Rule in civic, social, financial, commercial and industrial problems, he seems to prefer business depressions and fosters social and ethical complexities. There is a willingness on the part of some to have others follow the right course or remain inactive and quiet until there is ponderous evidence of misdirection or until their own activities are affected. This is true not only in financial and commercial affairs, but in professional life, thereby the public suffers. We cannot hope for perfection, nor can we expect that there will be decided improvement unless fear and selfishness which retard progress will be overcome to a greater extent and make it possible to adjust matters.

We invariably enter a new year with hopes as well as uncertainties, realizing that efforts rightfully applied will make for progress, but that disappointments will be encountered. It is necessary that we have confidence in our fellow men and co-workers and it is with the determination to do our part that we venture upon new experiences. The best way to do business and advance professional service is to join with others in well-directed efforts.

SIGNS OF PROGRESS IN PHARMACY

ASIDE from the papers of the Scientific Section, every other division of the program of the AMERICAN PHARMACEUTICAL ASSOCIATION has shown a purpose to improve the practice of pharmacy. Reference is made to the researches relative to drug extraction, how and why there is variation in dosage of prescriptions. It has emphasized that the individual needs not only experience but a knowledge which enables him to understand what he sees and does. Series of articles dealing with the subjects have appeared in the JOURNAL and will, no doubt, stimulate the studies and result in a better understanding and realization of the importance of prescription practice, which in turn enables physicians to comprehend why the results of their prescribing may lack the uniformity which they expect, and gives them greater assurance that by closer cooperation, studies and conferences their practice will be improved, thereby better service is rendered the public. It should impress the fact that medicine, including dentistry and pharmacy, has other problems which concern members of these professions and it is gratifying to note that this spirit of cooperation is being strengthened.

There are promotions which apply especially to pharmacy in which the other divisions of medicine should take an active part and pharmacists should be helpful

in activities that enable the related professions to improve their service. Reference is here made to legislation, regulation of practice, revision of the standards, and changes that may come about through plans of President Roosevelt's Committee on Economic Security. In all of these the professions have an interest and to make them more effective and serve their purposes mutual studies by the professions are essential and helpful factors.

A NEW U S P X INTERIM REVISION OF THE ERGOT ASSAY

F FULLERTON COOK, CHAIRMAN, U S P COMMITTEE OF REVISION

THE first interim Revision of the Tenth Revision of the Pharmacopœia became official on January 1, 1934, and made certain changes in the assay of ergot and its fluidextract, also a modification of the manufacturing method for the fluidextract of ergot. In the first revision, the standard for ergot remained as in the original text, namely, a fluid preparation of ergot.

Since then, however, as a result of further investigation, it has been found desirable to adopt the alkaloidal salt, ergotamine ethanesulfonate, as the official ergot standard.

For the purpose of insuring uniformity in the ergotamine ethanesulfonate to be used as the official ergot standard, the U S P Board of Trustees has arranged for the packaging in ampuls, under nitrogen, of a carefully standardized lot of this alkaloidal salt. This ergot standard may be obtained through the office of the Chairman of the U S P Committee of Revision, 43rd Street and Woodland Avenue, Philadelphia, Pa.

By this new revision (No. 3) ergot will be required to possess a potency, per gram, equivalent to not less than that of 0.5 mg. of the official standard and the fluidextract must be adjusted to possess a potency, per cubic centimeter, equivalent to that of not less than 0.4 mg. and not more than 0.65 mg. of the standard ergotamine ethanesulfonate.

The new monographs for ergot and fluidextract of ergot released in Interim Revision No. 3 on January 1, 1935, will become official and enforceable on May 1, 1935. Anyone desiring a copy of the "Interim Revision Announcement No. 3" may obtain it by addressing the Chairman, E. Fullerton Cook, 43rd Street and Woodland Avenue, Philadelphia, accompanying their request with *ten cents in stamps* to cover printing and distribution.

TERCENTENARY OF CHEMICAL INDUSTRIES

The year 1935 will mark the three hundredth anniversary of the establishment of the chemical industries in America. This anniversary will be celebrated by the American Chemical Society at its annual spring meeting during the last week of April of that year. Elaborate plans of the Society's New York Section, now well under way, indicate that this celebration will be a memorable one in the annals of American industry. Leaders in industry, finance and government will unite with the 17,000 members of the American Chemical Society to celebrate three hundred years of achievement of the American chemical industries—*Industrial and Engineering Chemistry*.

SCIENTIFIC SECTION

BOARD OF REVIEW OF PAPERS—*Chairman*, F E Bibbins, George D Beal, L W Rising, H M Burlage, L W Rowe, John C Krantz, Jr, Heber W Youngken

CONTINUOUS-READING TITRATION APPARATUS *

BY LAWRENCE H BALDINGER ¹

As an aid in presenting the subject of electrometric titration to a class in Analytical Pharmacy, a simple, inexpensive apparatus was constructed which was rugged enough to withstand frequent use by students, sufficiently accurate to emphasize continuous-reading electrometric titration methods. The apparatus as described can be assembled and wired in about three hours. All of the parts of the apparatus except the galvanometer and the milliammeter can be purchased from a radio dealer. The total cost should not exceed twenty-five dollars.

Discussion—The ordinary potentiometric titrations involve the reading and plotting of E M F values of the titration cell *versus* the milliliters of reagent used.

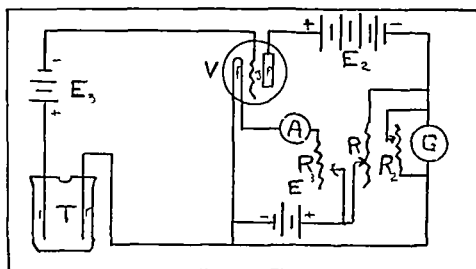


Fig 1—Continuous reading titration apparatus—V, electron tube, f, filament, p, plate, g, grid, T, titration cell, i, platinum indicator electrode, r, reference electrode, G, galvanometer, A, milliammeter, R₁, 25 000 ohm rheostat, R₂, 25 ohm rheostat, R₃, 85 ohm rheostat, E₁, 3-volt battery, E₂, 22.5-volt battery, E₃, 1.5-4.5 volt battery

Using the vacuum-tube apparatus no plotting is necessary unless desired for laboratory records. Instead of using a "balanced" circuit, *i e.*, a circuit in which the E M F of the titration cell is balanced against a known E M F, the vacuum-tube apparatus employs an "unbalanced" circuit in which the course of the reaction is followed by observing galvanometer deflections. The theory upon which this apparatus is based, as well as a description of the newer wiring diagrams and uses, has been discussed in the literature (1). Inasmuch as some difficulty was experienced in duplicating results using some previously reported wiring diagrams,

the apparatus used in this work was finally assembled according to the method of Goode (*loc cit*). See Fig 1.

In addition to the ease with which the course of a reaction can be followed by observing the galvanometer deflections, this type of apparatus offers the advantage over the potentiometric method of titration in that the vacuum tube operates as a voltmeter which draws practically no current from the titration cell.

The heated filament (f) emits a stream of electrons which impinge upon the plate (p) setting up a current which activates the galvanometer (G). The current in the galvanometer circuit is made up of two parts: (a) the residual plate current and (b) that current which is a function of the grid bias developed by the electrodes of the titration cell. As the grid bias is changed the plate current is altered correspondingly depending upon the amplification factor of the vacuum tube. The residual plate current is so large in comparison with the current which is a function of the

* Scientific Section, A. P. H. A.

¹ Instructor in Pharmacy, University of Notre Dame, Notre Dame, Indiana

grid bias that it must be balanced by an equal and opposite current before a titration can be performed. An RCA Radiotron tube, type UX-199, drawing 0.04–0.05 ampere current at optimum operation, was used in this apparatus. A plate voltage of 22.5 volts was found to be sufficient for our work. Although additional grid bias was not needed in our experiments, C-battery terminals were provided on the panel. A 25-ohm variable resistance (R_2) acts as a galvanometer shunt. The current of the filament battery acting through a 25000 ohm variable resistance (R_1) serves to balance out the residual plate current and thereby to increase the sensitivity of the galvanometer. The D'Arsonval galvanometer¹ (G) is an inexpensive model having a resistance of 150 ohms and a sensitivity of 1.7 megohms at 12.5 cm. The milliammeter (A) may be either a portable or panel type. See Figs 1 and 2.

In order to simplify still further the apparatus used, graphite and platinum, tungsten and platinum, and silicon carbide-platinum electrode pairs were used in place of the calomel half-cell-platinum assembly as proposed by previous workers. Inasmuch as only E. M. F. changes, not actual values, are observed with this apparatus, nothing is to be gained by the use of the calomel half-cell, provided that other electrodes will give consistent results.

Brunnich (2) has employed the graphite and platinum electrode pair in neutralization reactions, connecting the electrodes directly to a galvanometer through a tapping key. Depolarization of the electrodes, an obvious result of prolonged key contact in Brunnich's assembly, is eliminated by the use of the vacuum-tube voltmeter. Furman and Wilson (3) have extended the use of the tungsten-platinum electrodes to oxidation-reduction titrations in a system analogous to that of Brunnich. Kamienski (4) showed that silicon carbide is an ideal substance to use as a constant reference

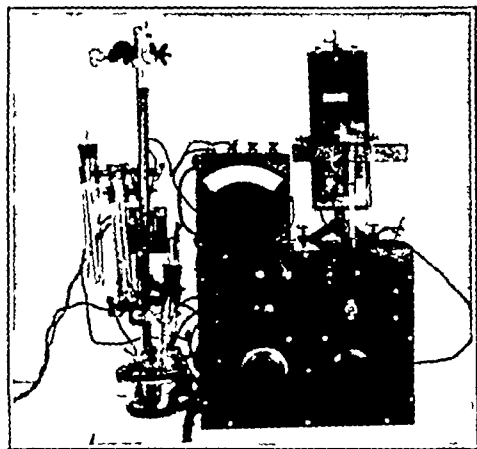


Fig 2—Titration apparatus

electrode since its potential is almost independent of the chemical properties of the solution in which it may be immersed. The electrode systems were constructed in compact units in order to minimize breakage. See Figs 2 and 3.

For the titration of strong acid with strong base, weak acid with strong base, and iodine with sodium thiosulphate, it was found that the graphite and platinum electrode pair gave satisfactory results. Both the tungsten-platinum assembly and the silicon carbide-platinum electrodes gave good results in the titration of ferrous ammonium sulphate with potassium dichromate solution. In all experiments the electrometric titrations were checked using standard methods of analysis. The galvanometer deflections were plotted *versus* milliliters of reagent and curves were drawn through the points to show the course of the reaction. See Fig 4. In order to show the practicability of this apparatus in a course in Analytical Pharmacy, a number of ferrous iron preparations of the U. S. P. were analyzed, using the tungsten-platinum and the silicon carbide-platinum assemblies. Simultaneously with the use of the vacuum-tube apparatus, the titrations were checked, using diphenylamine

¹ Central Scientific Co., Chicago, Ill. Catalog No. F-4451

SCIENTIFIC SECTION

BOARD OF REVIEW OF PAPERS—*Chairman*, F E Bibbins, George D Beal, L W Rising, H M Burlage, L W Rowe, John C Krantz, Jr, Heber W Youngken

CONTINUOUS-READING TITRATION APPARATUS *

BY LAWRENCE H BALDINGER ¹

As an aid in presenting the subject of electrometric titration to a class in Analytical Pharmacy, a simple, inexpensive apparatus was constructed which was rugged enough to withstand frequent use by students, sufficiently accurate to emphasize continuous-reading electrometric titration methods. The apparatus as described can be assembled and wired in about three hours. All of the parts of the apparatus except the galvanometer and the milliammeter can be purchased from a radio dealer. The total cost should not exceed twenty-five dollars.

Discussion—The ordinary potentiometric titrations involve the reading and plotting of E M F values of the titration cell *versus* the milliliters of reagent used.

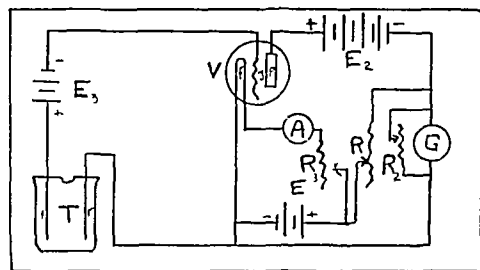


Fig 1—Continuous reading titration apparatus—V, electron tube, f, filament, p, plate, g, grid, T, titration cell, i, platinum indicator electrode, r, reference electrode, G, galvanometer, A, milliammeter, R₁, 25 000 ohm rheostat, R₂, 25 ohm rheostat, R₃, 85 ohm rheostat, E₁, 3-volt battery, E₂, 22.5 volt battery, E₃, 1.5-4.5 volt battery

Using the vacuum-tube apparatus no plotting is necessary unless desired for laboratory records. Instead of using a "balanced" circuit, *i e.*, a circuit in which the E M F of the titration cell is balanced against a known E M F, the vacuum-tube apparatus employs an "unbalanced" circuit in which the course of the reaction is followed by observing galvanometer deflections. The theory upon which this apparatus is based, as well as a description of the newer wiring diagrams and uses, has been discussed in the literature (1). Inasmuch as some difficulty was experienced in duplicating results using some previously reported wiring dia-

grams, the apparatus used in this work was finally assembled according to the method of Goode (*loc cit*). See Fig 1.

In addition to the ease with which the course of a reaction can be followed by observing the galvanometer deflections, this type of apparatus offers the advantage over the potentiometric method of titration in that the vacuum tube operates as a voltmeter which draws practically no current from the titration cell.

The heated filament (f) emits a stream of electrons which impinge upon the plate (p) setting up a current which activates the galvanometer (G). The current in the galvanometer circuit is made up of two parts: (a) the residual plate current, and (b) that current which is a function of the grid bias developed by the electrodes of the titration cell. As the grid bias is changed the plate current is altered correspondingly depending upon the amplification factor of the vacuum tube. The residual plate current is so large in comparison with the current which is a function of the

* Scientific Section, A. P. H. A.

¹ Instructor in Pharmacy, University of Notre Dame, Notre Dame, Indiana.

grid bias that it must be balanced by an equal and opposite current before a titration can be performed. An RCA Radiotron tube, type UX-199, drawing 0.04–0.05 ampere current at optimum operation, was used in this apparatus. A plate voltage of 22.5 volts was found to be sufficient for our work. Although additional grid bias was not needed in our experiments, C-battery terminals were provided on the panel. A 25 ohm variable resistance (R_2) acts as a galvanometer shunt. The current of the filament battery acting through a 25000 ohm variable resistance (R_1) serves to balance out the residual plate current and thereby to increase the sensitivity of the galvanometer. The D'Arsonval galvanometer¹ (G) is an inexpensive model having a resistance of 150 ohms and a sensitivity of 1.7 megohms at 12.5 cm. The milliammeter (A) may be either a portable or panel type. See Figs 1 and 2.

In order to simplify still further the apparatus used, graphite and platinum, tungsten and platinum, and silicon carbide-platinum electrode pairs were used in place of the calomel half-cell-platinum assembly as proposed by previous workers. Inasmuch as only E. M. F. changes, not actual values, are observed with this apparatus, nothing is to be gained by the use of the calomel half-cell, provided that

other electrodes will give consistent results. Brunnich (2) has employed the graphite and platinum electrode pair in neutralization reactions, connecting the electrodes directly to a galvanometer through a tapping key. Depolarization of the electrodes, an obvious result of prolonged key contact in Brunnich's assembly, is eliminated by the use of the vacuum-tube voltmeter. Furman and Wilson (3) have extended the use of the tungsten-platinum electrodes to oxidation-reduction titrations in a system analogous to that of Brunnich. Kamienski (4) showed that silicon carbide is an ideal substance to use as a constant reference

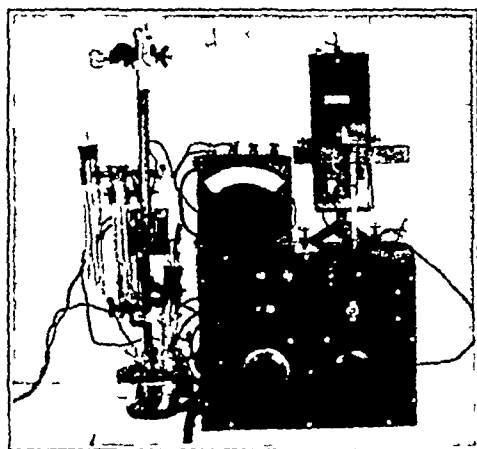


Fig 2—Titration apparatus

electrode since its potential is almost independent of the chemical properties of the solution in which it may be immersed. The electrode systems were constructed in compact units in order to minimize breakage. See Figs 2 and 3.

For the titration of strong acid with strong base, weak acid with strong base, and iodine with sodium thiosulphate, it was found that the graphite and platinum electrode pair gave satisfactory results. Both the tungsten-platinum assembly and the silicon carbide-platinum electrodes gave good results in the titration of ferrous ammonium sulphate with potassium dichromate solution. In all experiments the electrometric titrations were checked using standard methods of analysis. The galvanometer deflections were plotted *versus* milliliters of reagent and curves were drawn through the points to show the course of the reaction. See Fig 4. In order to show the practicability of this apparatus in a course in Analytical Pharmacy, a number of ferrous iron preparations of the U. S. P. were analyzed, using the tungsten-platinum and the silicon carbide-platinum assemblies. Simultaneously with the use of the vacuum-tube apparatus, the titrations were checked, using diphenylamine

¹ Central Scientific Co., Chicago, Ill. Catalog No. F-4451

as an indicator In practically all of the titrations of these compounds, it was found that about 0.15 ml more of potassium dichromate solution was necessary to reach a diphenylamine end-point after the end-point had been indicated by the apparatus This is in agreement with the findings of Knop (5) and of Kolthoff and Sarver (6) who have suggested a correction factor for the oxidation of diphenylamine

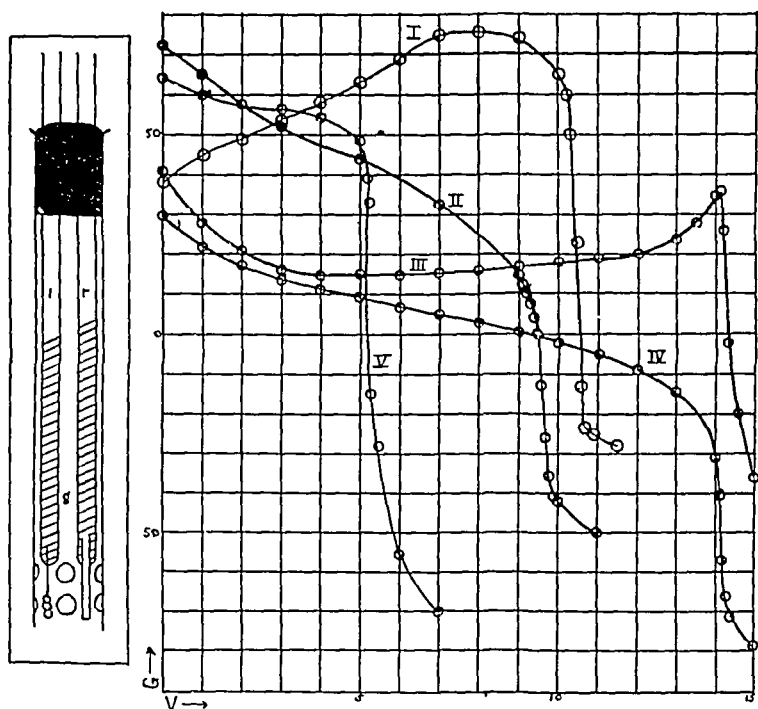


Fig 3 —
Electrode
assembly i,
platinum
electrode, r,
reference
electrode, g,
glass tubing

Fig 4—Titration Curves—G, galvanometer readings, V, millimeters of reagent, I, hydrochloric acid with sodium hydroxide Graphite platinum electrodes II, acetic acid with sodium hydroxide Graphite platinum electrodes III, Mohr's salt with potassium dichromate Tungsten platinum electrodes IV, Mohr's salt with potassium dichromate Silicon carbide platinum electrodes V, Iodine with sodium thiosulphate Graphite platinum electrodes

Procedure—A weighed sample is treated according to quantitative methods up to the titration stage In the case of the ferrous compounds the sample is treated with 20 ml of diluted sulphuric acid (1 volume sulphuric acid with 4 volumes of water) and 15 ml of a sulphuric phosphoric acid mixture (75 ml sulphuric acid and 75 ml phosphoric acid diluted with water to 500 ml) Following this treatment the iron solution is diluted to 200 ml with water After immersing the electrodes in the solution the filament current is increased to 0.05 amperes and the galvanometer adjusted to obtain a deflection of 50 or 60 mm For best results the galvanometer shunt should be completely eliminated before beginning the titration Resistance R_2 should be used only to protect the galvanometer from sudden current changes while adjusting resistance R_1 After some practice the experimenter will have little trouble in obtaining the proper galvanometer reading prior to titration The reagent is run into the titration cell, at first, several milliliters at a time, and then more slowly, as the equivalence point is reached when galvanometer readings are taken

more frequently. During some titrations it may be necessary to readjust the galvanometer by means of resistance R_1 , especially if an instrument with a small scale is used. Vigorous stirring of the reaction mixture is necessary and is best accomplished by a small motor stirrer. It is well to wait thirty seconds after each addition of reagent to allow the galvanometer reading to become constant. The end point is characterized by a sudden large deflection, $\pm e$, dE/dV , the rate of change of the $E-M-F$ of the titration cell with a small change in concentration of the reagent approaches a maximum. It was observed that concordant results could be obtained when using the graphite or silicon carbide electrodes if, after each titration, the electrodes were immersed in cleaning solution, followed by thorough washing with distilled water. This apparatus is being used at the present time in these laboratories for the titration of alkaloids. A report of the work will appear shortly.

SUMMARY

1 The use of graphite-platinum, tungsten-platinum and silicon carbide platinum electrode pairs with a vacuum-tube titration apparatus has been suggested and illustrated.

2 The apparatus has been applied to the titration of some ferrous iron compounds of the U S P.

REFERENCES

- (1) Goode *J Am Chem Soc*, 44 (1922), 26, Calhane and Cushing, *Ind Eng Chem* 15 (1923), 1118, Treidwell, *Helv Chim Acta* 8 (1925), 89, Williams and Whitenack, *J Phys Chem*, 31 (1927) 519, Müller *Trans Electrochem Soc*, 62 (1932), 335, Furman, *Ind Eng Chem, Anal Ed*, 2 (1930) 213, Kolthoff and Furman "Potentiometric Titrations," John Wiley & Sons, Inc., New York (1931) Taylor *Treatise on Physical Chemistry* "Van Nostrand Co., New York, 2nd Edition (1931)
- (2) Brännich *Ind Eng Chem*, 17 (1925), 631
- (3) Furman and Wilson, *J Am Chem Soc*, 50 (1928), 277
- (4) Kamiński *Z physik Chem*, 145 (1929), 48, 138 (1928), 345
- (5) Knop, *J Am Chem Soc*, 46 (1924), 263
- (6) Kolthoff and Server *J Am Chem Soc*, 32 (1910), 539, 52 (1930), 4179, 53 (1931)

2906

NOTE The author takes this opportunity to thank the Global Corporation and the Acheson Graphite Co. of Niagara Falls, N Y., for the silicon carbide and graphite electrodes used in this work.

A NOTE ON THE ASSAY OF REDUCED IRON *¹

BY MARGARETHE OAKLEY AND JOHN C. KRANTZ, JR.

INTRODUCTION

Reduced iron has found a place in practically all of the pharmacopœias of the world. In some, the evaluation is expressed in terms of metallic iron and in others, the total iron content is employed. Winter (1) reviewed these various standards in 1913. The eighth revision of the United States Pharmacopœia employed the iodimetric process of assay. The ninth and tenth revisions employed the well-known mercuric chloride method. The British Pharmacopœia specifies the copper sulphate procedure, this method depends upon the displacement of the copper by the iron. In all of these methods, the ferrous or ferric oxide present in reduced iron remains unattacked by the reagents employed. In 1909 Frerichs (2) reviewed

* Scientific Section, A. Ph. A., Washington meeting, 1934

¹ From the Bureau of Chemistry, Maryland State Department of Health

the various assays and recommended the copper sulphate method on the basis of its being capable of a greater degree of precision

Owing to the fact that this method has been continued in the British Pharmacopœia of 1932, in which only 80 per cent of metallic iron is required, the authors decided to investigate the method and compare it with that of the U S P

EXPERIMENTAL

Three commercial grades of reduced iron were mixed and sifted through a number 100 sieve Assays were conducted by the method recommended for the U S P XI and by the following modification of the method of the British Pharmacopœia The difference between the U S P X and U S P XI methods lies in the fact that in the latter the mercuric chloride solution and reduced iron are heated together on a water-bath for ten minutes instead of boiling for five minutes

The modified British Pharmacopœia method is as follows

Transfer to a 100-cc volumetric flask about 0.6 Gm of reduced iron accurately weighed Add 30 cc of copper sulphate T S heated to its boiling point Shake the mixture frequently and vigorously during ten minutes Cool to 25° C and add sufficient distilled water to make 100 cc Mix thoroughly and filter To exactly 25 cc of the filtrate, add 20 cc of diluted sulphuric acid and titrate with tenth normal potassium permanganate Each cc of tenth-normal potassium permanganate corresponds to 0.005584 Gm of Fe "

The results obtained on the same sample of reduced iron by each of the two methods are shown in Table I

No	Modified B P Method	U S P XI Method
1	98.30	93.85
2	99.02	95.58
3	99.01	94.55
4	98.62	95.90
5	98.38	95.43
6	98.31	95.38
7	98.85	94.78
8	98.30	96.30
9	98.18	95.50
10	98.32	
11	98.90	
12	98.48	
13	98.00	
14	98.30	
Mean	98.49	95.25

The probable error of a single determination of the modified British process calculated by the formula $P.E. = \pm 0.6745 \sqrt{\frac{\sum v^2}{(n-1)}} = 0.23$ per cent By the U S P XI process the probable error is ± 0.48 per cent

Obviously the modified British process is less cumbersome than the mercuric chloride method and according to the analysis of the data set forth has advantage of a higher degree of precision The difference between the mean of the two determinations is approximately 3 per cent Since the purity of the substance is based upon the elementary iron content, it is manifestly important to determine which of the two procedures more closely approximates the theoretical value

In order to determine the absolute accuracy of the two methods a sample of powdered electrolytic iron was obtained through the courtesy of Dr George D Beal. This iron assayed between 99 and 100 per cent by direct titration with potassium permanganate after acid solution.

With the sample of pure iron both the U S P and the modified British methods gave results between 99 and 100 per cent.

A sample of iron was prepared by thoroughly mixing 95 parts of powdered electrolytic iron with 4 parts of ferric oxide, 0.5 part of ferrous sulphide and 0.5 part of ferrous phosphide. This mixture containing 95 per cent of metallic iron was submitted to analysis by both methods.

The results obtained on this adulterated sample are set forth in Table II.

TABLE II		
No	Modified B P Method	U S P XI Method
1	98.11	95.10
2	97.57	94.71
3	96.85	96.56
4	98.09	95.17
5	97.28	94.60
6	94.75	94.20
7	97.95	
8	94.18	
9	98.00	
10	98.40	
11	98.20	
12	98.20	
13	98.72	
14	98.42	
Mean	97.48	95.06

It is obvious that in the presence of these impurities the modified method of the British Pharmacopœia fails to give results which correspond closely to the absolute content of elementary iron.

CONCLUSION

1. The presence of ferric oxide, ferrous sulphide and ferrous phosphide in a sample of reduced iron vitiates the results obtained by the copper sulphate method. The mercuric chloride method gives absolute values in the presence of these impurities.

BIBLIOGRAPHY

- (1) Winter, P. E., *Jour. A. Ph. A.* 2 (1913), 296.
- (2) French, G., *Merck's Report*, July (1909), 165.

ASSAY METHODS FOR SALTS OF ORGANIC ACIDS *

BY RICHARD M. HITCHENS

The assay methods for alkali salts of organic acids have been for many years the subject of much discussion. A survey of the problems involved is given by Clark.¹

* Scientific Section, A. Ph. A., Washington meeting, 1934.

¹ Clark, *Jour. A. Ph. A.*, 15 (1926), 6.

The customary method of assay has been to ignite the salt to sodium carbonate which is determined by titration with standard acid. This method is subject to many sources of error, it is tedious and time-consuming. Ignition to sodium sulphate or to sodium chloride, which are determined gravimetrically, has been used by some investigators. Still others have isolated the acid by extraction and determined the acid gravimetrically or volumetrically. All of these methods require considerable time and are subject to many sources of error.

In 1927, Henville¹ described a new method of determining the cation in sodium salicylate and sodium benzoate. His method consists of direct titration of the aqueous solution of the salt with standard acid to a methyl orange end-point in the presence of diethyl ether to extract the organic acid as it is liberated. At a methyl orange end-point the solution is extracted with a fresh portion of ether and the titration continued to a second methyl orange end-point which is not affected by further extraction with ether.

Such a method is simple, direct, rapid and accurate. It furnishes the same information as does the conversion to sodium carbonate, sulphate or chloride but with a higher degree of accuracy and in a much shorter time.

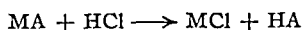
The method was adopted by the 1932 British Pharmacopœia as an assay method for sodium benzoate and sodium salicylate except that bromphenol blue indicator was substituted for methyl orange.

In an attempt to simplify the method still further, Krantz and Schmidt,² working on the official monograph for United States Pharmacopœia XI, decreased the volume of the aqueous layer, increased the volume of diethyl ether and discarded the second extraction. As stated by Henville,¹ this procedure is valid for sodium benzoate, the end-point after the first extraction agreeing closely with that after the second. With sodium salicylate, however, the first end-point is somewhat indistinct and gives low results. Different analysts in this laboratory disagree as much as 0.5% on the first end-point, their results ranging from 99.0-99.5% on pure sodium salicylate. After the second ether extract the analysts agree well, obtaining values of from 99.8-100.0%.

By the proposed U. S. P. XI method, even pure sodium salicylate would assay only 99.5% as a maximum. It would seem advisable for the method of the U. S. Pharmacopœia to be revised, whereby two extractions are made, thus giving quantitative results. This should present no difficulties since the extra step is simple and rapid and requires no special equipment. The whole analysis may be completed in ten minutes.

The simplicity and accuracy attained by the Henville method for the assay of sodium benzoate and sodium salicylate suggests its adoption for other salts.

Although the method has been suggested only for these two salts it is in reality a general method of assay. Consider a salt MA. The reaction



can be carried to completion provided the following conditions are fulfilled

- (1) HA is sparingly soluble in water and readily soluble in some solvent immiscible with water

¹ Henville, *Analyst* 52 (1927) 149

Krantz and Schmidt *Jour. A. Ph. A.*, 52 (1933), 953

(2) HA is not too strong an acid, K_a less than about 2.5×10^{-3} . If much stronger than this complete liberation of the acid at a p_H value of 4, the methyl orange end point, can scarcely be effected without an excessive number of extractions.

(3) MOH is a base, the dissociation constant of which is greater than 10^{-6} . If lower, the end point, where MCl alone is present in the aqueous layer, will occur in too acid a solution for accurate determination of the end point.

(4) The salts MCl and MA are water soluble and insoluble in the immiscible solvent.

Any such salt MA, therefore, can be assayed by this method if a suitable solvent can be found for the acid HA, if HA is fairly water-insoluble and not too strong, and if the base MOH is not too weak. The choice of solvent, the indicator and the number of extractions necessary will depend upon the salt in question.

Sodium benzoate conforms well with these specifications. With $K_a = 7 \times 10^{-5}$, at a p_H value of 4, about 30% of the benzoate remaining in the aqueous layer will be present as sodium benzoate, the rest as benzoic acid. Benzoic acid is readily ether-soluble and only slightly water-soluble. From solubility data one would expect about 500 parts of benzoic acid in the 75 cc ether layer present in the U. S. P. XI analysis to one part in the 20-cc aqueous layer, or that the first end-point would be about 0.2% low. Thus one ether extraction should be sufficient. This is verified by experiment.

Sodium salicylate is slightly different. The dissociation constant of salicylic acid is about 1×10^{-3} . Thus at a p_H value of 4, only 20% of the salicylate in the aqueous layer is present as salicylic acid, the remainder is sodium salicylate. From solubility data there should be about 600 parts of salicylic acid in the ether layer per one part in the aqueous layer. But there are four parts of sodium salicylate per one of salicylic acid so that the combined salicylates in the aqueous layer may amount to 0.8% of the original sample. The first end-point will be low by this amount. A second extraction is necessary to remove the last traces of salicylates. This is borne out by experiment.

Ammonium benzoate and salicylate may be assayed by this method, the same arguments hold as for the sodium salts. The correct indicator would be methyl red. Unfortunately this dissolves in the ether layer. Methyl orange, however, gives results only 0.05% high, well within the limits of accuracy of the method.

The method is applicable to other salicylates such as magnesium, zinc, strontium.

It is applicable also to sodium barbital. Barbital has an acid dissociation constant of about 10^{-7} . Thus at a p_H value of 4, practically complete liberation of barbital has occurred, only 0.1% of the barbital remaining in the aqueous layer being present as sodium barbital. Even though fairly water-soluble and only moderately ether-soluble, one ether extract should be ample to give quantitative results.

It is applicable also to sodium phenobarbital. Phenobarbital has an acid dissociation constant of about 4×10^{-7} . Thus at a p_H value of 4, 0.4% of the phenobarbital in the aqueous layer is present as the sodium salt. Since phenobarbital is only slightly water-soluble and readily ether-soluble, one extraction should give quantitative results.

The method was tested experimentally on the above salts.

Materials—Sodium benzoate and salicylate, U S P products dried to constant weight at 100° C Ammonium benzoate and salicylate U S P dried to constant weight over solid sodium hydroxide Strontium salicylate U S P, magnesium salicylate, zinc salicylate, all hydrates and not dried before use Sodium barbital U S P dried to constant weight at 100° C Sodium phenobarbital N N R dried to constant weight at 140° C, according to the instructions of N N R¹ and A D M A²

Reagents—Diethyl ether U S P was found to be sufficiently neutral without further treatment N/2 hydrochloric acid was standardized gravimetrically by precipitation as silver chloride

The procedure was essentially that of Krantz and Schmidt³ except that after the first end-point had been reached the aqueous layer was drawn off through a separator into a second flask, 20 cc of ether added and the titration continued until a second methyl orange end-point was reached

The results are tabulated below The first column states the salt titrated, the second the assay after one extraction, the third the assay after two extractions Each analysis refers to a different sample of the salt

Salt	Assay after One Extraction	Assay after Two Extractions
Sodium benzoate	99 5%	99 7%
	99 6	99 8
	99 7	99 8
Sodium salicylate	99 5	100 0
	99 2	99 8
	99 2	99 9
Ammonium benzoate	99 0	99 2
	99 2	99 4
(by ammonia evolution)		99 1
		99 3
Ammonium salicylate	98 6	99 4
(by ammonia evolution)		99 4
Strontium salicylate	98 9	99 5
dihydrate	99 3	99 9
Magnesium salicylate	99 1	99 8
tetrahydrate	99 0	99 6
Zinc salicylate, trihydrate	101 0	102 2
Sodium barbital	99 9	99 9
	99 8	99 8
Sodium phenobarbital	98 5	98 5
	98 5	98 5

It is evident that sodium and ammonium benzoate give almost quantitative results with one extraction

All of the salicylates show the same type of results, the first end-point being at least 0 5% low, the second quantitative

The magnesium, strontium and zinc salicylates are all hydrates No attempt was made to dry them to the proper water content since the object in view was to determine the difference between the end-point after one and after two ether extractions The magnesium and strontium salts apparently contain the correct amount of water of hydration The zinc salt is slightly over-dried

¹ New & Nonofficial Remedies " American Medical Association

² American Drug Manufacturers' Association, 'Proceedings' 1933

³ Refers to footnote 2 page 12

Sodium barbital gives quantitative results even with only one extraction. This would be expected on account of the weakly acidic nature of barbital.

The sodium phenobarbital gives low results even when dried at 140°C . This is in accord with the results of the A. D. M. A.² who found the salt to form a stable hydrate from which it was impossible to remove all the water even at 140°C . That this method does titrate quantitatively the cation in this salt is demonstrated in the following series of experiments.

As a further check on the method the following experiment was carried out on pure salicylic acid, benzoic acid, phenobarbital and barbital. A suitable weight was titrated directly with standard alkali to a phenolphthalein end-point. The water was removed by evaporating under reduced pressure. The resulting salt was titrated as above and the titration compared directly to that obtained by neutralizing exactly the same volume of sodium hydroxide with standard acid to a methyl orange end-point in the presence of ether. In this manner the effect of possible impurities in the commercial salts was eliminated, the problem being the quantitative recovery of the standard alkali added. Entirely analogous results to those in the above table were obtained. With phenobarbital and barbital quantitative recovery was obtained with one ether extraction, with benzoic acid within 0.2% on the first extraction and quantitative recovery on the second, with salicylic acid at least 0.5% low on the first extraction but quantitative recovery on the second. These experiments act as an independent check on the accuracy of the method.

CONCLUSION

Henville's method for assay of sodium benzoate and sodium salicylate whereby the salt is titrated directly with standard acid in the presence of diethyl ether to a methyl orange end-point is a general method. It is applicable to water-soluble salts of the type MA where HA is an acid fairly insoluble in water and appreciably soluble in some solvent immiscible with water, where HA is not too strong an acid, apparent dissociation constant less than 2.5×10^{-3} , where MOH is not too weak, apparent dissociation constant greater than 10^{-6} .

The simplified assay method for sodium salicylate suggested by U. S. P. XI in which the end-point is taken after only one ether extraction, gives at least 0.5% low results, two extractions being necessary to give the correct assay.

LABORATORIES MONSANTO CHEMICAL COMPANY,
ST. LOUIS, MO.

DIGITALIS ASSAY ON NORMAL AND EXSANGUINATED CATS *

BY DAVID I. MACHT

(WITH THE TECHNICAL ASSISTANCE OF M. B. MACHT)

Pharmacologists in general recognize the cat method as the most useful means of assaying digitalis preparations. Variations crop up, however, even when this method is employed. To insure the most accurate and reliable data concerning

* From the Pharmacological Research Laboratory, Hynson Westcott & Dunning, Inc., Baltimore, Md.

assay of digitalis, a knowledge of the different factors affecting or producing such variations is very desirable. A number of these have already been discussed by various authors. Van Wijngaarden has suggested a mathematical formula for calculating the most reliable figures obtained from a given series of cat experiments (1). Macht and Colson have found that there is a marked difference in the killing doses of digitalis for vagotomized and non-vagotomized cats, respectively (2). Furthermore, the present writer has discovered that meteorological conditions, and particularly sudden changes in the barometric pressure, must be taken into account when assaying digitalis on cats (3). In the present communication, another factor markedly influencing the toxicity of digitalis for cats is described.

In this laboratory, fresh arterial blood is often obtained from cats for assaying or determining the activity of heparin, which is manufactured on the premises. Healthy cats are anesthetized with ether for this purpose. One cannula is inserted into the carotid artery and another into the femoral vein. From 30 to 60 cc of blood are drawn from the artery, and a corresponding volume of physiological saline is then injected into the animal through the vein. After this operation the animal is kept under anesthesia and used for some other physiological or pharmacological experiment. The author and his assistants found that when digitalis preparations were assayed on a cat in which blood (drawn off in the manner described above) had been replaced by physiological saline, the lethal dosage was much smaller than that required to kill a normal cat. The subjoined table exhibits the results obtained with five different lots of digitalis tincture assayed on normal cats, on the one hand, and on cats bled from one-half hour to one hour previously, on the other. In every case the animals were kept under light ether anesthesia,

TABLE INDICATING RESULTS OF ASSAY OF VARIOUS LOTS OF TINCTURE OF DIGITALIS

Normal Cats			Exsanguinated Cats		
Lot	Weight of Cat in Kg.	M L D —Cc. per Kilo of 1 10 Dilution	Lot	Weight of Cat in Kg.	Cc. of Blood Drawn
A	3 0	10 1	A	3 0	60
	3 9	9 2		2 4	50
	3 0	10 8		2 4	45
	2 8	10 0		3 2	45
	3 4	10 0		3 2	60
B	2 9	14 2	B	2 5	25
	3 0	14 4		2 7	35
C	3 0	14 0	C	2 8	40
	2 7	14 0		3 0	55
	3 2	13 8		2 9	45
D	2 0	13 2	D	3 0	50
	1 9	12 0		3 2	55
E	3 3	14 9	E	3 1	65
	3 0	13 4		3 2	65
	2 9	14 4		3 2	60
Grand average		12 6 cc			9 5 cc

and the tincture, diluted 1 10 with physiological saline, was injected through the femoral or saphenous veins according to standard methods at regular intervals. The minimal lethal dose required to kill an animal is expressed in cubic centimeters of the 1 10 dilution. It will be noted that, even when the amount of blood removed

was as little as 25 cc, the killing dose of the digitalis was smaller in the exsanguinated cats than it was in the normal animals. What the explanation of this phenomenon is the writer is not prepared to say. It is certainly not due to any irritation or injury to the vagus and sympathetic nerves in the neck because control experiments were made on animals in which these nerves and the carotid arteries were removed without subsequent bleeding of the animal. The difference in toxicity would seem to indicate that the active principles of digitalis may enter into some loose combination with the proteins of the blood and render them less potent, but this has not been definitely established. The writer has always found that the most reliable figures are obtained when the tests for digitalis are performed on cats weighing not less than 2 Kg and not more than 3.5 Kg. The difference in the killing doses for exsanguinated and normal cats, respectively, is worthy of notice because the greater our knowledge of the factors responsible for variations in digitalis assay, the more reliable will be the figures obtained by investigators who take these factors into consideration.

REFERENCES

- (1) Van Wijngaarden, *Arch expil Path Pharmacol*, 113 (1926), 40
- (2) Macht and Colson, *J Pharmacol & Exper Therap*, 9 (1916), 343
- (3) Macht, *Am J Pharm*, 106 (1934), 135

BALTIMORE MD

METHODS OF IDENTIFICATION OF THE RHIZOMES OF IRIS VERSICOLOR L AND IRIS VIRGINICA L *

BY GEORGE M HOCKING ¹

Most of the Blue Flag Root in commerce appears to come from the north- and central-eastern counties of Florida. The whole drug appears on the market in two forms, viz, "with fibre" (i.e., with the roots still attached to the rhizome) and "free of fibre" or "stripped". The species, *Iris versicolor* L., has always been named as the official source of the drug, *Iris versicolor*. Another species, *I. caroliniana* Watson, was recognized for the first time in the N F V, presumably on the basis of Farwell's statement (1) that in his twenty-five years' experience with crude drugs, Blue Flag Root had come almost entirely from this species. By the rule of priority, the name *I. virginica* L. takes preference over the name *I. caroliniana* Watson, and this revised nomenclature is used in this paper.

The statement is sometimes made (2), (3), (4) that Blue Flag Root is adulterated. Thus, Rusby (5), (6) says that this is probably the case to a large extent with *Iris versicolor* from the south-eastern states. In 1911, he (7) stated that much of the article appeared to come from *I. missouriensis* Nuttall, which is provided with a larger rhizome and was more readily and cheaply collected. The possibility of adulteration from this source now is remote since no Blue Flag seems to be collected in the areas where this species grows. In the south, collectors of and dealers in Blue Flag accept as genuine only the "red root," i.e., the rhizome reddish. ¶

* Scientific Section A Ph A, Washington meeting, 1934

¹ Instructor in Pharmacology, School of Pharmacy, The George Washington Uni

broken across as opposed to "White Flag Root" which is whitish in section Farwell¹ states that in forty years of crude drug handling he had never observed adulteration of *Iris versicolor*

Small (8) groups *Iris versicolor* and *I. virginica* together with *I. Shrevei* Small² into the subgenus *Versicolores*. This closely related group of species is incorporated by Dykes (9) into the subgenus *Længata* of section *Apogon* of the genus, and this indicates a close kinship with the European *I. pseudacorus* L. so long known to materia medica. Members of subgenus *Versicolores* are distributed over eastern and central North America. Contrary to the statement which appears in many floras, e. g., Small (8), *I. versicolor* does not occur throughout all of eastern North America, but is restricted to the area, roughly, north and east of a line between Washington, D. C., and northern Wisconsin (10). *I. Shrevei*, if it is to be regarded as a true species and not identical with *I. virginica*, occurs in the Mississippi Valley region, while in the broad strip of territory between, reaching from the Great Lakes in the north to Florida in the south, occurs *I. virginica*.

METHODS

Because of the importance of Florida as a source of Blue Flag, methods were developed to distinguish rhizomes of the two most abundant Florida species, viz., *Iris hexagona* Walter and *I. savannarum* Small from the somewhat less common species *I. virginica* and from *I. versicolor*, which latter does not grow naturally in the state. In addition, distinctions between the two official species were developed. According to Hume (11), the seven species of *Iris* native to Florida may be classified into three distinct groups comprising (a) *I. tripetala* Walter, (b) *I. virginica* L., (c) *I. savannarum* Small, *I. Kimballii* Small, *I. hexagona* Walt., *I. Albispirtus* Small, *I. rivularis* Small.

I. tripetala was the only type not studied, but this species is not one likely to provide adulteration since its rhizome is said (12) to be small and cordlike.

Fresh rhizomes of *I. hexagona*, *I. savannarum*, *I. versicolor* and *I. virginica* were obtained from plants identified by botanists specializing in the genus. The rhizomes were thoroughly examined macroscopically and microscopically, first fresh, then in the dried state. To facilitate sectioning and study, the dried rhizomes were immersed in 15% chloral solution for a few days. It was found possible to distinguish the rhizomes of official species and also to distinguish between them on the basis of three or more of the following points: (1) Dimensions, (2) Color (a) external, (b) internal, (c) extract in chloral solution, (d) with vanillin-hydrochloric acid, (3) Fracture, (4) Comparison of cortical and stelar radii, (5) Count of vascular bundles in cross section, (6) Breadth of vascular bundles, (7) Diameter of intra-endodermal parenchyma cells, (8) Odor.

In determining rhizome diameter, cortical and stelar radii, and vascular bundle numbers, pieces of average to maximum thickness rather than those of smaller size (which may be immature) must be selected, whereas for the remaining data, this precaution is unnecessary.

The eight characteristics enumerated above will now be taken up singly

¹ Personal communication to author

² Anderson (personal communication) regards *I. Shrevei* Small as at most no more than a variety of *I. virginica* L.

1 *Dimensions*—Considerable variation exists in the length of pieces of the rhizome in commercial samples of the drug. Likewise, segmental and internodal dimensions are of little value since they vary greatly within the species and even for the individual plant because of varying environmental conditions.

Diametric values are of considerably more value in identification, although these again are affected by external conditions of growth. Of the group studied, *I. virginica* possesses by far the largest rhizome, only *I. savannarum* can compare with it in this respect, and the rhizomes of the two may be distinguished by other means.

AVERAGE MAXIMUM DIAMETERS OF FRESH* RHIZOME (IN MM)

	<i>I. versicolor</i>	<i>I. virginica</i>	<i>I. hexagona</i>	<i>I. savannarum</i>
Vertical	16	24	11	12
Lateral	21	32	13	19

* Immersion of dried rhizomes in 15% chloral solution gives comparable values

2 *Color*—(a) A casual inspection of a sample of the drug from *I. virginica* gives the impression that the rhizome is distinctly reddish. A more careful examination, however, will show that *I. virginica* and *I. versicolor* are quite similar externally, but that in the former the rhizome has been sliced longitudinally (probably because of its large size), thereby exposing the bright red dish brown of the interior. The rhizome of *I. hexagona* is externally a rich reddish to dark purplish brown, that of *I. savannarum* similar but distinctly grayer.

(b) The rhizome of *I. versicolor* sectioned is dirty yellow to yellowish white to pale pinkish, that of *I. virginica* may be in places yellowish pink, but characteristically sections are dark red to purplish brown. In the other two species examined, sections are light yellowish almost creamy white, and this is said to be true of the four remaining species of Florida iris (12).

(c) When macerated for several days in 15% chloral solution, the liquid takes on a dark reddish brown coloration with *I. virginica* but becomes no more than greenish yellow with *I. versicolor*.

(d) As discovered for *I. pseudacorus* by von Lingelsheim (13), the rhizome of *I. virginica* is colored a brilliant red when treated with vanillin and strong hydrochloric acid, while that of *I. versicolor* is stained a pale pink. The rhizome of *I. savannarum* is only slightly stained by the same reagent. This test might perhaps be extended to other non official *Iris* species if satisfactory, it would be particularly useful for the examination of the powdered drug.

3 *Fracture*—With the exception of *I. virginica* the fresh rhizome of Florida *Iris* species break with a snap leaving a clean fracture (12). The fracture of *I. virginica* and *I. versicolor* rhizomes is tough.

4 *Comparison of Stelar and Cortical Radial Values*—In the table following, the cortical radius is expressed as a percentage of the total radius. minimum and maximum values were found and recorded.

(CORTICAL RADIUS/TOTAL RADIUS) × 100%

	<i>I. versicolor</i>	<i>I. virginica</i>	<i>I. hexagona</i>	<i>I. savannarum</i>
Minimum	16%	21%	30%	29%
Maximum	26%	38%	45%	56%
Average	21%	29½%	37½%	42½%

It will be noted that the maximum value for *I. versicolor* is less than the minimum value for the non-official species, whereas for *I. virginica*, although the variation is greater and the higher values tend to overlap values for non-official species, nevertheless the average value is quite distinctly lower. There is sufficient difference in the values for the official species to be of service in distinguishing between them.

5 *Count of Vascular Bundles in Cross Section*—The material, softened in 15% chloral solution, was cross sectioned in thin slices and stained with basic fuchsin. Counting bundles was rendered easier and more accurate by mounting on a slide, cutting into several strips, and using a lens magnifying ten diameters.

AVERAGE TOTAL COUNTS OF VASCULAR BUNDLES

<i>I versicolor</i>	263	<i>I hexagona</i>	181
<i>I virginica</i>	240	<i>I savannarum</i>	195

I versicolor and *I virginica* again show a relationship in the numbers of their vascular bundles, and have a distinctly higher count than in the other species examined

6 *Dimensions of Vascular Bundles and Parenchyma Cells*—The vascular bundles of *I versicolor* and *I virginica* are similar, both in size and composition, and are materially different from those of the non-official *Iris* species examined. The bundles in all were concentric, with the xylem forming a more or less complete ring around the phloem. In both official species, the individual elements making up the bundles, particularly the tracheae, are considerably smaller in cross section and more numerous than those of the other species. Only the smallest diameter of a bundle here called the breadth was determined.

AVERAGE VASCULAR BUNDLE BREADTHS (IN MICRONS)

<i>I versicolor</i>	340	<i>I hexagona</i>	154
<i>I virginica</i>	336	<i>I savannarum</i>	152

This again graphically illustrates the resemblance of the official species, and indicates, by a more than 100% increase in vascular bundle diameter, how markedly they differ from the non-official species studied.

7 *Odor*—The rhizome of *I virginica* has a very distinctive and aromatic odor, somewhat resembling that of slippery elm, this distinguishes it from *I versicolor*, in which the odor is slight and not distinctive.

APPLICATION OF METHODS

The methods just outlined were utilized in the examination of six commercial samples of the dried Blue Flag Root purchased on the open market and of four specimens of the green plants obtained from field collectors who took care to select specimens of the form identical with that which they collected commercially. Three of the latter were identified from the flower as well as from the rhizome (numbers 7, 8, 10).

No. of Sample	1	2	3	4	5	6	7	8	9	10
							Fresh			
Rhizome (mm) { aver lgth		76	115	76	75	56				
{ max diam	26	21	22	22	20	19	25	27	28	19
(Cort rad /tot rad) × 100%										
Horiz	32	20	17	30	21	16	21	22	30	34
Vert	37	36	32	38	34	27	31	27	34	41
Aver	34	26	23	34	28	20	26	25	32	38
Vasc Bdle Count	250	308	221	216	244	296	246	289	365	160
Vasc Bdle Brdth (in μ)	238	330	194	295	285	389	305	227	250	190
Diam intraendoder parench										
cells (in μ)	105	100	83	90	80	65	85	70	95	80
Color with vanillin-HCl	Deep red	Deep red	Deep red	Deep red	Deep red	Slight red	Deep red	Deep red	Deep red	None

The foregoing data afford proof of the value of the methods used in determining identity in commercial samples of Blue Flag. The prime source of each crude drug sample was traced. It was found that four came from Florida (Nos 1, 2, 3, 4), and one each from the Carolinas (No 5) and from the middle west, possibly Indiana (No 6). No 6 was identified as from *I versicolor*, the samples from the south as

from *I. virginica*, except in one instance (No 3), where the article from a northern dealer was found admixed with some *I. versicolor*.

The green plants were obtained from four areas in northeastern Florida, three (Nos 7, 8, 9) represented *I. virginica*, the fourth (No 10) was probably *I. savannarum*. The dealer handling this probably did not supply any large firms.

DIFFERENTIATION OF IRIS VERSICOLOR AND IRIS VIRGINICA

The monograph on *Iris Versicolor*, N F V, has been criticized because in it a single description is employed to describe the drugs from two species. Since they differ so markedly in some ways, it is preferable to describe them separately. The following description of the article as it occurs in commerce is suggested as sufficiently distinguishing.

Unground Iris Versicolor—Rhizome frequently branched, often provided with remnants of flower stalk, segments markedly constricted and thickly developed at intervals, elliptical in cross section at the enlarged portions, cylindrical at the constrictions. Up to 10 cm in length and 2 cm in thickness, with an average length of 5 to 6 cm and an average diameter of a little over 1 cm, not ordinarily sliced longitudinally, outer surface grayish brown, obscurely annulated with darker colored markings of leaf bases alternating light and dark, the lower with numerous circular root scars 1 to 2 mm across, and sometimes root remnants, particularly at the enlarged portions of the rhizome, coarsely wrinkled longitudinally especially upon the upper surface, fracture short, somewhat spongy, the broken surface with yellowish white to pale pinkish brown central cylinder and pale purplish cortex, the central cylinder exhibiting whitish vascular bundles distributed throughout and surrounded by a distinct endodermis, radius of cortex approximately one fifth of total radius. Odor slight, somewhat unpleasant, taste acrid and nauseous.

Structure—A more or less exfoliating epidermal layer of suberized cells with brownish walls, a hypodermis of one to three rows of cells with uniformly thickened strongly lignified walls some of which contain a reddish brown amorphous substance, a relatively narrow cortex of characteristic structure with ovoid or spherical parenchyma cells, large intercellular spaces some of the parenchyma containing starch, others a reddish brown amorphous substance, an endodermis of a single layer of cells with walls lignified and thickened on the inner and radial surfaces, a central cylinder made up of numerous nearly spherical parenchyma cells, between which are intercellular spaces not as large as those in the cortex, concentric vascular bundles occasional in the cortex, more numerous in the parenchyma of the central cylinder, mostly grouped toward its periphery, between 250 and 300 vascular bundles in cross section of rhizome, individual breadths averaging 340 microns.

Tests for Identity—In contact with chloral solution, this is colored no more than a greenish yellow, when the powdered drug is treated with vanillin and strong hydrochloric acid, it is colored a faint pink.

Unground Iris Virginica—Mostly simple branching much less common than in *I. versicolor*, up to 20 cm, on an average about 8 cm, in length and averaging 1 cm in thickness, segments separated by enlargements not as pronounced as in *I. versicolor*, cut into longitudinal pieces by halving or quartering, many broken pieces, outer surface grayish brown to purplish brown, but sectioned surfaces pinkish brown to dull red to purplish brown, giving entire drug a reddish appearance, more deeply annulated than in *I. versicolor*, the upper surface with prominent markings of leaf bases and often showing their fibrous remains, the lower with numerous root scars, fracture short and brittle, the broken surface light to dark reddish brown to dark purplish brown, outer portion of cortex sometimes yellowish, radius of cortex approximately three-tenths of radius of rhizome. Otherwise similar to *I. versicolor*. Odor pronounced, aromatic, reminiscent of slippery elm, taste acrid, astringent, disagreeable leaving hot sensation in throat.

Structure—Similar to that of *I. versicolor*. Vascular bundles of similar size, but somewhat less abundant, with an average count of 240 in cross section.

Tests for Identity—In contact with chloral solution, this is colored a dark reddish brown, when treated with vanillin and strong hydrochloric acid, the powdered drug is colored a brilliant red.

CONCLUSIONS

1 In revising them onograph for *Iris Versicolor*, N F V, the name *Iris caroliniana* Watson should be replaced by that of *Iris virginica* Linné which is more acceptable by the rule of priority

2 It is suggested that the section describing *Iris Versicolor*, N F V, be revised so as to distinguish between the drug from the species *Iris versicolor* L and *I virginica* L

3 In order to distinguish the official from spurious species of *Iris*, it is necessary to include in the monograph more specific histological data, in particular, vascular bundle counts and dimensions, and stelar and cortical ratios, and in addition, color of the drug and color reaction with vanillin and hydrochloric acid

4 *Iris Versicolor* from the southeastern United States does not seem to be generally adulterated at the present time

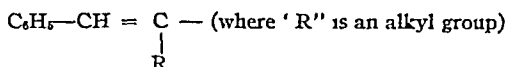
REFERENCES

- (1) Farwell, Oliver A, *Bull Pharm*, 33 (1919), 475
- (2) Ricketts, Helen E, *Bull Amer Iris Soc*, No 3 (1921), 27, 28
- (3) *Idem*, *Les Iris Cultives*, I (1923) 175-183
- (4) Lloyd, J U, *Pharm Rev*, 23 (1905), 330
- (5) Rusby, H H, Bliss, A R, and Ballard, C W, "The Properties and Uses of Drugs" (1930), page 310
- (6) *Idem*, *The Messenger*, 6 (1929), 238
- (7) *Idem*, *Pharm Era* 44 (1911), 94
- (8) Small, J K, 'Manual of the Flora of the Southeastern United States' (3rd Edition, 1933), page 337 Excerpt
- (9) Dyles, W R, through Diels, L, in A Englers "Die natürlichen Pflanzenfamilien" Band 15a (1930), S 501
- (10) Anderson, Edgar, *Ann Mo Bot Gard*, 15 (1925), 241-332
- (11) Hume, H Harold, *Bull Amer Iris Soc* (April 1933) Reprint
- (12) *Idem*, Native Iris Rhizomes (MS in edit) (ca 1933)
- (13) von Lingelsheim, A, *Apoth Ztg*, 44 (1929), 1314 1315

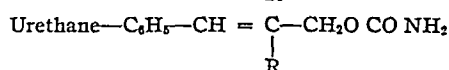
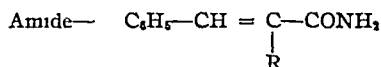
A STUDY OF A NEW SERIES OF URETHANES *

BY W A LOTT AND W G CHRISTIANSEN

As reported in another article, the authors have studied the hypnotic potency of amides and ureides whose acyl residues contain the characteristic grouping



In order to completely evaluate the grouping in this respect, it was decided to introduce it also into carbinol residues of urethanes, the carboxy group of acids from which the amides (and ureides) are derived being replaced by the carbinol $\text{—CH}_2\text{OH}$ group. The general formulas for the amides and the corresponding urethanes are as follows



* Scientific Section A PH A Washington meeting, 1934

Two such urethanes (carbamates) were prepared and tested for hypnotic activity against rats, they were found to be inactive

EXPERIMENTAL

1 *2-Methyl Cinnamyl Urethane*—14.8 Gm (0.1 mol) of 2-methyl cinnamyl alcohol was dissolved in dry benzene and treated with a 24% benzene solution of phosgene containing 9.9 Gm of phosgene, the latter was added dropwise with mechanical agitation, and external cooling. The initial temperature was 15° C, it rose about 5° C during this addition. After the temperature had fallen to 15° C, 12.1 Gm of dry, freshly distilled dimethyl aniline dissolved in 50 cc of dry benzene was added. This caused another moderate rise in temperature. After agitating for one half hour to complete the reaction, the reaction mixture was washed several times with water to remove the dimethylaniline hydrochloride. The benzene solution of the chloroformate was partially dried by shaking with anhydrous Na_2SO_4 , filtered, returned to the flask equipped with the agitator and treated for one hour with a large excess of 28% aqueous ammonia. The benzene solution of the urethane was washed successively with water, dilute hydrochloric acid, 10% sodium carbonate and finally again with water. By this time a white crystalline product had already appeared in the benzene layer. It was collected by filtration. When the benzene filtrate was dried and concentrated, an additional quantity of the urethane crystallized.

About 12 Gm of the crude material was obtained as snow-white crystals of melting point 130–131° C. After several recrystallizations from alcohol the product melted at 132–133°.

Assay % Nitrogen found—7.46, calculated for $\text{C}_{11}\text{H}_{13}\text{O}_2\text{N}$ 7.33%

2 *2-Amyl Cinnamyl Urethane*—In an exactly analogous manner 2-amyl cinnamyl alcohol was converted to the corresponding urethane. In this case no product crystallized from the benzene solution until after it was dried, concentrated and chilled. From 19 Gm of the alcohol about 11 Gm of almost white crystalline product was obtained. After several recrystallizations from alcohol the product was snow white and melted at 77.5–78° C.

Assay % Nitrogen found—5.60, calculated for $\text{C}_{14}\text{H}_{21}\text{O}_2\text{N}$ 5.66%. 7 Gm of an oily by-product was obtained but not examined.

The alcohols from which these urethanes were prepared were obtained by reduction of the corresponding aldehydes using ethoxy magnesium chloride and the method described by Bogert and Powell (1). These authors also described convenient methods for the preparation of α -alkyl cinnamaldehydes (2).

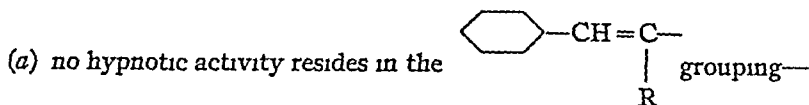
Biological tests with albino rats indicated that these two urethanes had no hypnotic action in doses up to 2 Gm per kilo.

The biological tests on compounds reported herein were made in the Biological Research Laboratories of E. R. Squibb and Sons and we gratefully acknowledge their assistance.

SUMMARY

1 Two examples of 2-alkyl cinnamyl urethanes were prepared and found to be lacking in hypnotic activity.

2 Since the urethanes in general are not rapidly hydrolyzed in the animal organism, it is to be concluded that either



or

(b) the above urethanes are not readily resorbed.

Since in rats, the corresponding amides are active, the latter seems more probable.

REFERENCES

- (1) *J A C S*, 53 (1931), 1609
- (2) *Am Perfumer and Essential Oil Rev*, 25 (1930), 617

RESEARCH DEPARTMENT OF THE CHEMICAL AND PHARMACEUTICAL LABORATORIES,
E R SQUIBB AND SONS, BROOKLYN, N Y

THE ACTIVE CONSTITUENTS OF ERGOT A PHARMACOLOGICAL AND CHEMICAL STUDY *¹

BY MARVIN R THOMPSON²

During 1929-1930, the writer published a series of ten reports embracing a review of the literature on Ergot and also the results obtained in certain pharmacological and chemical studies on Ergot and its more important pharmaceutical preparations. These reports presented evidence, in confirmation of a rather wide-spread unanimity of opinion, showing, among other things, that

1 The amino bases of Ergot (histamine, tyramine, choline, etc.) could contribute little or nothing to the valuable therapeutic activity of the drug or any of its preparations

2 The valuable therapeutic activity resided wholly in the "total specific alkaloidal fraction"

3 Of the four then known alkaloids, ergotamine and ergotaminine were comparatively inert while both ergotoxine and ergotamine were indistinguishable in exhibiting intense activity by pharmacologic methods. Because of this great pharmacological activity, it was concluded that practically the full therapeutic activity of Ergot must reside in ergotoxine and/or ergotamine

4 Aqueous Extracts of Ergot were practically worthless because they were invariably deficient in ergotoxine or ergotamine and in addition were improperly standardized or not standardized at all

5 Fluid extract of Ergot, U S P, or similar alcoholic or hydroalcoholic preparations, contained alkaloidal activity in satisfactory amounts and hence such extracts were concluded to be superior to aqueous types of extracts

6 Either ergotoxine or ergotamine was completely representative of the valuable pharmacological activity of Ergot, and, therefore, either of these alkaloids should be complete therapeutic substitutes for Ergot or its crude extracts

Since publishing the above-mentioned reports, the author has continued to experimentally investigate certain phases of the ergot problem, largely because some of the most important conclusions regarding the activity and active principles of ergot have been based, by all workers in the field, upon experimental evidence of a much too indirect type, as for example, results obtained from experiments upon isolated uteri taken from non-pregnant and virgin animals. Such matters as absorption, changes in the uterus caused by pregnancy and the different stages of the oestrus cycle, and inherent differences in susceptibility between different animals, had been neglected by all pharmacologists up to 1930

* Abstracted from a dissertation submitted to the Board of University Studies of the Johns Hopkins University, in conformity with the requirements for the degree of Doctor of Philosophy reported in part before the Scientific Section of the annual convention of the AMERICAN PHARMACEUTICAL ASSOCIATION in Toronto August 25 1932, and in part at the annual meeting of the same body on May 10 1934, at Washington D C

¹ From the Department of Chemical Hygiene, School of Hygiene and Public Health, The Johns Hopkins University

² Emerson Professor of Pharmacology, School of Pharmacy, University of Maryland, Consultant Pharmacologist, Food and Drug Administration U S Department of Agriculture

Of the conclusions drawn up to this time, the most important one requiring further confirmation in the way of more direct experimental evidence had to do with the active principles. Ergotoxine and ergotamine salts were being offered to the medical profession as full and complete substitutes for ergot or its crude pharmacopoeial extracts. If these pure alkaloids were completely representative of ergot activity, there would be little justification for the continued use of the officially recognized crude extracts.

Earlier unpublished observations caused the writer to conduct a series of comparative experiments, using available salts of ergotoxine and ergotamine, and various crude extracts, for the purpose of determining whether or not the oxytocic effects of the purified alkaloids were actually the same as the effects produced by the crude extracts when administered to intact pregnant cats.

THE METHOD

The afore mentioned observations resulted in the selection of a method involving the use of pregnant cats because it was believed that of all experimental animals available for a large number of comparative experiments, the cat was the nearest possible approach to human conditions. For the adopted technique, anesthesia was necessary. Various barbituric acid derivatives such as nembutal, dial, amytal, phanodorm and phenobarbital, as well as ether, chloroform, chlorotone and avertin have been used, but since all of these anesthetics were observed to depress uterine activity if the anesthesia became deep, and since pregnant cats vary considerably in their individual susceptibility to anesthetics, it was found distinctly advantageous to employ anesthetics which permit of intravenous administration so that the very cautious injection of divided doses could be carried out in such a manner that a relatively light anesthesia could be insured. The sodium salts of the shorter acting members of the barbituric acid derivatives were, therefore, used for most of the experiments. The use of inhalation anesthetics was abandoned in the beginning because they required an objectionable amount of constant attention, and also because respiratory irritation often caused decidedly objectionable coughing or sneezing during the maintenance of light anesthesia. A tracheal cannula was used to further avoid such disturbances. A somewhat heavier anesthesia, effected with ether, was usually employed during the operative procedure, but thereafter a lighter level of hypnosis was maintained.

Following anesthesia, the pregnant uterus was exposed, and the movements recorded upon the kymograph by the use of the movable arms of a myocardiograph, tying the arms into opposite ends of one of the more longitudinally contractile segments of one horn of the uterus. The animal was not immersed in a constant temperature bath, but a large electric warming pad was employed, and the small area of exposed uterus was constantly irrigated with Locke Ringer solution at 37.5° C, the liquid dropping upon cotton partially covering the exposed part of the uterus. The entire procedure involves no hemorrhage.

A normal tracing was taken for approximately one half hour or more in all instances before administering the ergot preparations. In the interpretation of the tracings reproduced in the illustrations of results obtained by this method, the relative magnitude of the recorded uterine responses cannot serve to show the actual relative intensity of the uterine activity produced by the different ergot preparations. The comparisons must be made with reference to presence or absence of response and *the rapidity of the onset of the response only*. The *magnitude* of the contractions in the different tracings is dependent, not alone upon the *intensity* of response induced by the ergot, but upon the contractility of the particular area of the uterus included between the two attached arms of the recording apparatus. Different uteri and different parts of the same pregnant uterus vary greatly in contractile power, and it was quite impossible to accurately judge the contractility at the time of attaching the recording apparatus. Some of the uteri showing the lowest magnitude of recorded response were observed to show a much greater actual response than other uteri which responded feebly but recorded enormous excursions of the writing lever on the kymograph. This could readily be noted simply by visual observations of the exposed uterus.

Using this technique, it is fully realized that the anesthesia and operative procedure results

in an "abnormal animal" The studies involved were, however, of a purely comparative nature with the surgical procedure and anesthesia operating as a more or less cancellable constant Nevertheless, to make this study as critical as possible, the effects of the various types of ergot preparations and chemical fractions or principles upon the strictly normal animal would obviously add to the significance of the results

Accordingly, use was made of an observation that representative extracts of ergot cause abortion in pregnant cats with phenomenal regularity, regardless of the stage of pregnancy The young are invariably born dead, not during the violent uterine activity caused by ergot, but following this activity by 6 to 24 hours In the very terminal stages of pregnancy the young are occasionally born alive This test is obviously not of an accurately quantitative nature but considerable importance has been attached to it as indicating ergot "activity" or "inactivity" in the fundamental studies which follow

COMPARISON OF THE ACTIVITY OF HYDRO-ALCOHOLIC EXTRACTS, AQUEOUS EXTRACTS AND AVAILABLE SALTS OF ERGOTOXINE AND ERGOTAMINE

1 *Pharmaceutical*—Suitable portions of 24 different lots of crude ergot, all assayed and found to be of U S P potency or higher, were mixed together to yield a total of approximately 5 Kg This material was ground and de-fatted by the U S P method An acid hydro-alcoholic fluidextract was prepared from 1 Kg by the fractional percolation method described elsewhere by the writer (1), a method involving the use of no heat whatever Percolation was continued until the combined percolates, when assayed by the modified (2) Broom-Clark method, exhibited an alkaloidal potency equivalent to 0.5 mg of ergotoxine ethanesulphonate per cc The volume of product was 3.790 liters This product, designated as Fluidextract No. 360, was stored in the refrigerator at 0° to 5° C, small portions being removed for use as needed

Another 1-Kg portion of the same powder was converted into an Aqueous Extract exactly as above, except that water alone constituted the menstruum Percolation was carried to the same volume as for the Fluidextract No. 360, i. e., 3.790 liters This product was designated as Aqueous Extract No. 361, and was stored in the same refrigerator as the Fluidextract No. 360 When assayed by the same method as the fluidextract, a potency equivalent to 0.19 mg of ergotoxine ethanesulphonate per cc was revealed It will be noted that this was considerably less than half of the alkaloidal potency contained in the hydro-alcoholic fluidextract *But it should also be noted that one cannot simply assume that aqueous extracts are alkaloid-free, even though they invariably contain less alkaloid than the hydro-alcoholic extracts*

Both of the above extracts were also assayed by the U S P Cockscomb method and by the colorimetric method of Smith (3) The writer, after several years of experience, holds little faith in the routine accuracy of the Cockscomb method unless an impossible number of birds are used It may be stated, however, that both extracts gave satisfactory cockscomb reactions in agreement with the potency revealed by the more accurate Rabbit Uterus method As to the colorimetric method, increased experience causes the writer to doubt the accuracy of the values originally obtained for the above extracts Both extracts gave the color reactions, however, and the fluidextract, as by the other methods, proved to possess a higher alkaloid content than the aqueous extract The colorimetric values were higher than the physiological values for both extracts Studies relating to the color reaction and its quantitative value will be reported later It is important

to point out that all three of these methods, which are believed to measure only alkaloidal activity, showed the presence of significant amounts of ergot alkaloids, even in the aqueous extract

2 *Pharmacological*—A number of experiments, recording the effects of oral doses of various ergot extracts as well as salts of ergotoxine and ergotamine upon the uterus of lightly anesthetized pregnant cats, showed beyond doubt that both aqueous and hydro-alcoholic extracts, as well as the commercially available salts of ergotoxine and ergotamine, were decidedly active in increasing the tonus and rhythmicity of the uterus. It was equally apparent that, viewing the results of four or more experiments upon each type of preparation, that the crude extracts, both aqueous and hydro-alcoholic, produced a uterine response which differed from that produced by either of the commercial alkaloidal salts. The chief difference was in the rapidity of the onset of response. Both of the above-described crude extracts acted much more promptly, usually well within ten minutes, and apparently more intensely than calculated equivalents of the ergotoxine and ergotamine salts. The effects of the alkaloidal salts developed only after 30 to 60 minutes. In these earlier experiments, the extracts were administered undiluted, the alkaloidal salts in 1:1000 dilution, all in 1- to 2-cc. oral doses by stomach tube.

Viewing all experiments, however, disturbing discrepancies were occasionally observed, particularly with respect to the promptness of action. The effects of the crude extracts usually developed within ten minutes, while the effects of the ethanesulphonate and phosphate of ergotoxine and the methanesulphonate and tartrate of ergotamine usually developed only after 30 to 60 minutes. But occasionally the effects of the crude extracts would be delayed until within the range of the time of action of the alkaloidal salts.

ABSORPTION FROM STOMACH AND INTESTINE

Realizing that anesthesia has a depressant effect upon gastro-intestinal function, it was thought possible that the active principles of ergot might not be absorbed from the stomach, and that the passage of the small dose volume into the intestine was delayed, thus accounting for these discrepancies in the rapidity of onset of action. This possibility was then investigated.

In a series of 9 experiments upon pregnant cats, following the usual technique, pyloric ligations were performed before oral administration of the ergot preparation by stomach tube. In not one instance did the characteristic effects upon the uterus develop, even though ridiculously enormous doses of crude extracts were given (up to 10 cc. of the extracts) within two hours. Upon the removal of the ligature, after approximately two hours, an effect would manifest itself promptly, especially if a dose of 10 or 20 cc. of water were administered. A representative experiment is illustrated by the tracing in Fig. 1.

It appears quite obvious, therefore, that none of the active principles of ergot, whether alkaloids or unknown substances, are absorbed to any significant extent from the stomach of the cat. Since the uterine activity could be made to manifest itself in no uncertain manner after removal of the pyloric ligature, it follows that absorption takes place from the small intestine. This was further confirmed in one experiment by leaving the pyloric ligature in place while a dose of 1 cc. of Fluidextract No. 360 was injected into the lumen of the small intestine by means



Fig 1—Cat late pregnancy uterus *in situ* Time in minutes Illustrating the lack of absorption of Ergot from the stomach and promptness of response of crude extracts following intestinal absorption Pylorus ligated prior to administration of first oral dose of an Aqueous Extract known to be active Note absence of oxytocic activity during two hours until ligature was removed, after which activity promptly developed Hydro alcoholic extracts in the same or even larger doses, likewise failed to show activity until the ligature was removed

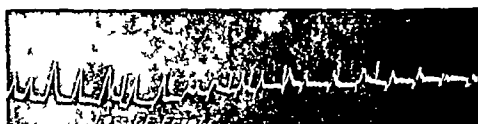


Fig 2—Cat late pregnancy uterus *in situ* Time Same as Fig 5 The prompt (within ten minutes) response following the oral administration of 10 cc of F E Ergot No 360 plus water The influence of respiratory movement is evident in this tracing Magnitude of recorded contractions is low because of inclusion of only very small area of uterus between the two arms of the apparatus

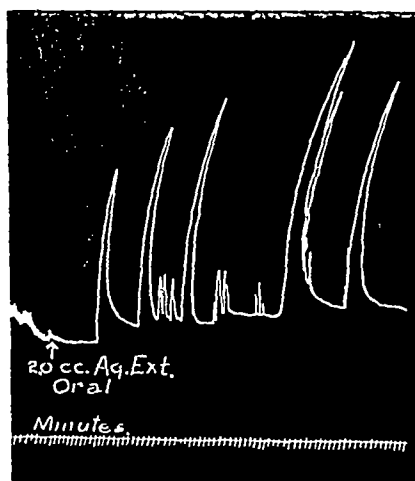


Fig 3—Cat late pregnancy uterus *in situ* Prompt response following oral administration of 20 cc of Aqueous Extract of Ergot with water

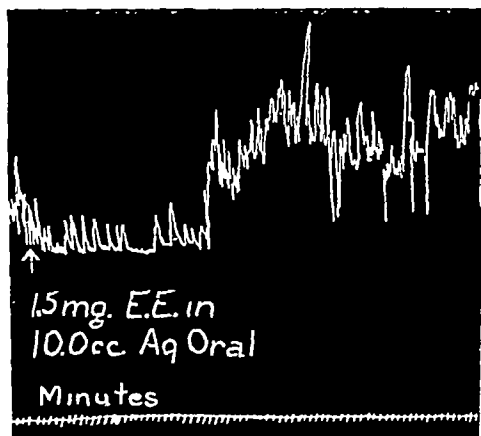


Fig 4—Cat late pregnancy uterus *in situ* Delayed response following oral administration of large dose (15 mg) of ergotoxine ethanesulphonate in 20 cc water

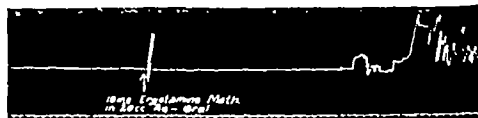


Fig 5—Cat late pregnancy uterus *in situ* Time in minutes The delayed uterine response following the oral administration of a large dose (10 mg) of ergotamine methanesulphonate After approximately one half hour, however, pronounced activity is evident

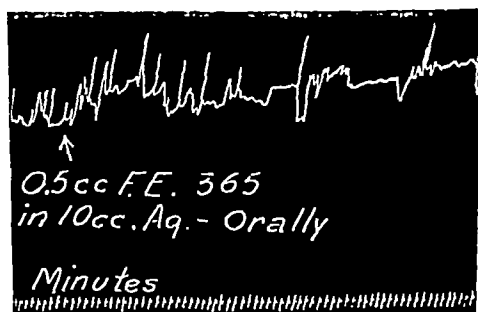


Fig 6—Cat late pregnancy uterus *in situ* Prompt response following oral administration of 0.5 cc of de alcoholized F E No 365 with water

of a hypodermic needle Uterine response resulted in $4\frac{1}{2}$ minutes, showing that intestinal absorption is quite rapid Four similar experiments were performed using ergotamine ethanesulphonate and ergotamine tartrate instead of a crude extract (two experiments upon each salt) No uterine effects were noted in any case within two hours while the pyloric ligation remained, even though the oral dose was 5 mg in each case Upon removal of the ligature, and administration of 20 cc of water, uterine response developed only after 30 to 60 minutes, again revealing a great difference between these alkaloidal salts and the crude extracts The effects produced by ergotamine and ergotamine were indistinguishable by this method of study

Because the comparative rapidity of onset of uterine action itself, following ergot administration into the gastro-intestinal tract, was the chief criterion to be used in distinguishing between the different constituents and preparations of ergot, it was necessary to use a procedure which would avoid the extremely variable delay in the passage of the dose from the stomach to the intestine It was found that this variable could be satisfactorily removed by either of two ways The drug could be injected directly into the lumen of the intestine, or the dose could be washed into the stomach with 10 to 20 cc of warm water The volume of water appeared to cause a fairly prompt opening of the pylorus in most instances, thus providing for a prompt transfer of the oral dose to the intestine for undelayed absorption The animals were fasted for at least 12 hours before use

DOSAGE

The dosage administered to the cats was purposely large in practically all experiments The method obviously has little quantitative value, but these studies were designed to simply determine presence or absence of oxytocic activity for various constituents and preparations of ergot, particularly with respect to type and promptness of action The actual doses are indicated in the tables and illustrations

DIFFERENCE BETWEEN NON-PREGNANT, PREGNANT AND POST-PARTEM UTERUS REGARDING RESPONSIVENESS TO ERGOT

The use of non-pregnant cats was abandoned in the beginning of this investigation because the uteri of such animals responded only feebly or not at all, regardless of the size of the oral dose of either aqueous or hydro-alcoholic extracts of ergot As a consequence the studies embraced in this report have involved the use of pregnant cats exclusively

The cats used were those in which pregnancy was so far advanced that it could be readily detected by simple observation of abdominal distension or by palpation While a considerable individual variation in sensitivity to ergot was observed, thus making observations rather obscure, the writer is left with the impression, after observing the uterine effects of ergot upon more than 250 cats in various stages of pregnancy and at various intervals post-partem, that the sensitivity or irritability of the uterus toward ergot increases as the pregnancy proceeds toward the termination of the gestation period Greatest sensitivity to orally administered ergot appeared to be immediately preceding, during and immediately after, labor After

TABLE I—RAPIDITY OF ONSET AND INTENSITY OF UTERINE EFFECTS FOLLOWING ORAL ADMINISTRATION OF VARIOUS ERGOT PREPARATIONS TO LIGHTLY ANESTHETIZED PREGNANT CATS

Type of Preparation	Alkaloid Content. ¹ Per cent	No of Experiments	Oral Dose ²	Average Time Required (Approx) for Onset of Definite Uterine Effect Minutes	Intensity of Uterine Effect
Fluidextract U S P	0 050	6	2 0 cc	6	Marked
Fluidextract, U S P	0 120	2	1 0 cc	6	Marked
Fluidextract, U S P ³	0 075	2	2 0 cc	8	Marked
Fluidextract U S P ³	0 03	2	2 0 cc	8	Marked
Fluidextract, U S P ³	0 015	2	2 0 cc	4	Marked
Aqueous Ext (Liq)	0 019	6	2 0 cc	4	Marked
Aqueous Ext (Liq)	0 012	2	2 0 cc	6	Marked
Aqueous Ext (Liq)	0 010	2	2 0 cc	8	Marked
Tablets Ergotin 3 grain ³	0 000	3	20 tablets dissolved in water	No effect	None
Ergotin (Bonjean) ³	0 125	2	0 5 Gm in water	6	Marked
Ergotin (Bonjean) ³	0 000	4	4 0 Gm in water	No effect	None
Ergotovine ethanesulphonate solution ⁴	0 100	12	1 0 cc	36	Doubtful to marked
Ergotamine tartrate solution ⁴	0 100	15	1 0 cc	38	Doubtful to marked
Histamine acid phosphate solution ⁴		3	10 0 mg	None	None
Tyramine hydrochloride solution ⁴		2	100 0 mg	None	None
Acetyl choline solution ⁴		2	50 0 mg	None	None

¹ Colorimetric method of Smith in terms of ergotovine ethanesulphonate² Washed in with 10 to 20 cc of warm water, by stomach tube³ Manufacturers label, age unknown⁴ Solutions freshly prepared W/V, not assayed

labor, the sensitivity appears to decline rapidly. By keeping a large number of pregnant cats on hand during the spring of 1932, it was possible to use two cats so nearly at term that true labor promptly followed the oral administration of 0.5 cc of a U S P Fluidextract of Ergot. Most powerful tonic uterine contractions started within five minutes in both cases, true labor developing in 35 minutes and 85 minutes, respectively. The uterine contents could not be expelled, of course, because of the abdominal incision. The violent abdominal muscular spasms forced uterus and contents through the incision to the exterior, throwing the recording apparatus out of adjustment and consequently running the kymograph tracings. Two other cats were used immediately after normal delivery was completed. A 0.5-cc dose of U S P Fluidextract, in two minutes for one and four minutes for the other, induced tonic contractions bordering on complete tetany. Uteri of cats used after the first day post-partem showed progressively decreasing sensitivity to ergot. After a week post-partem, the uterine response was observed to be very feeble, as in the case of the non-gravid uterus (3 experiments, 1 cat 49 hours post-partem, 1 cat 86 hours post-partem and 1 cat 196 hours post-partem). These few experiments cannot establish this important point conclusively, but if this general impression is correct even in part, there is a possibility that puerperal human patients may also gradually lose uterine sensitivity to ergot as the length

TABLE I—RAPIDITY OF ONSET AND INTENSITY OF UTERINE EFFECTS FOLLOWING ORAL ADMINISTRATION OF VARIOUS ERGOT PREPARATIONS TO LIGHTLY ANESTHETIZED PREGNANT CATS

Type of Preparation	Alkaloid Content ¹ Per cent	No of Experiments	Oral Dose ²	Average Time Required (Approx) for Onset of Definite Uterine Effect Minutes	Intensity of Uterine Effect
Fluidextract, U S P	0 050	6	2 0 cc	6	Marked
Fluidextract, U S P	0 120	2	1 0 cc	6	Marked
Fluidextract, U S P ³	0 075	2	2 0 cc	8	Marked
Fluidextract, U S P ³	0 03	2	2 0 cc	8	Marked
Fluidextract, U S P ³	0 015	2	2 0 cc	4	Marked
Aqueous Ext (Liq)	0 019	6	2 0 cc	4	Marked
Aqueous Ext (Liq)	0 012	2	2 0 cc	6	Marked
Aqueous Ext (Liq)	0 010	2	2 0 cc	8	Marked
Tablets Ergotin 3 grain ³	0 000	3	20 tablets dissolved in water	No effect	None
Ergotin (Bonjean) ³	0 125	2	0 5 Gm in water	6	Marked
Ergotin (Bonjean) ³	0 000	4	4 0 Gm in water	No effect	None
Ergotoxine ethanesulphonate solution ⁴	0 100	12	1 0 cc	36	Doubtful to marked
Ergotamine tartrate solution ⁴	0 100	15	1 0 cc	38	Doubtful to marked
Histamine acid phosphate solution ⁴		3	10 0 mg	None	None
Tyramine hydrochloride solution ⁴		2	100 0 mg	None	None
Acetyl choline solution ⁴		2	50 0 mg	None	None

¹ Colorimetric method of Smith in terms of ergotoxine ethanesulphonate² Washed in with 10 to 20 cc of warm water, by stomach tube³ Manufacturers label, age unknown⁴ Solutions freshly prepared W/V, not assayed

labor, the sensitivity appears to decline rapidly. By keeping a large number of pregnant cats on hand during the spring of 1932, it was possible to use two cats so nearly at term that true labor promptly followed the oral administration of 0.5 cc of a U S P Fluidextract of Ergot. Most powerful tonic uterine contractions started within five minutes in both cases, true labor developing in 35 minutes and 85 minutes, respectively. The uterine contents could not be expelled, of course, because of the abdominal incision. The violent abdominal muscular spasms forced uterus and contents through the incision to the exterior, throwing the recording apparatus out of adjustment and consequently running the kymograph tracings. Two other cats were used immediately after normal delivery was completed. A 0.5-cc dose of U S P Fluidextract, in two minutes for one and four minutes for the other, induced tonic contractions bordering on complete tetany. Uteri of cats used after the first day post-partem showed progressively decreasing sensitivity to ergot. After a week post-partem, the uterine response was observed to be very feeble, as in the case of the non-gravid uterus (3 experiments, 1 cat 49 hours post-partem, 1 cat 86 hours post-partem and 1 cat 196 hours post-partem). These few experiments cannot establish this important point conclusively, but if this general impression is correct even in part, there is a possibility that puerperal human patients may also gradually lose uterine sensitivity to ergot as the length

THE EFFECT OF ERGOT PREPARATIONS UPON NORMAL PREGNANT CATS

Every ergot preparation included in Table I caused abortion within 36 hours in at least one pregnant cat, when given orally by stomach tube in large but non lethal doses, *except histamine, tyramine, acetyl choline and the two preparations which proved to be alkaloid free*. The latter two preparations were without effect even in relatively enormous doses by either oral, subcutaneous or intramuscular administration, but those cats which failed to abort were subsequently (after three days or more) caused to lose their young by the administration of one of the other crude extracts or one of the salts of ergotamine or ergotoxine. Large necrotic abscesses were invariably produced by the subcutaneous administration of the larger doses of the crude extracts. By this method, therefore, it has been determined that the available salts of ergotoxine and ergotamine are decidedly active orally or parenterally. Likewise, hydro alcoholic and aqueous extracts were decidedly active orally or parenterally unless they were alkaloid-free as determined colorimetrically. This method does not permit of a critical comparison between the salts of ergotoxine and ergotamine and the active crude extracts, because all induced abortion in an apparently similar manner.

Ten mg of histamine acid phosphate, 50 mg of tyramine hydrochloride or 20 mg of acetyl choline, given individually or all in the same dose, by stomach tube, were ineffective in causing abortion (5 experiments).

The results of the investigation up to this point completely agreed with Moir's conclusion that the available salts of ergotoxine and ergotamine are not carriers of the full oxytocic activity of ergot. But inasmuch as it was possible to demonstrate the presence of alkaloids by their color reaction in every specimen which had proved active on either anesthetized or unanesthetized pregnant cats, it appeared quite probable that either the activity was completely due to the "total alkaloids" in some form or other, or else that the new unidentified non-alkaloidal "Moir principle" had disappeared with the alkaloids in the two inactive preparations.

THE DETERMINATION OF THE EXISTENCE AND CHEMICAL NATURE OF A NEW HIGHLY IMPORTANT SUBSTANCE IN ERGOT

Extracts of ergot were prepared by using alcohol, ether, chloroform, acetone and other organic solvents. All preparations, administered after removal of the solvent, were active in varying degrees upon unanesthetized and anesthetized pregnant cats. The activity invariably proved to be of the "prompt new type" rather than the "delayed ergotoxine or ergotamine type". A 50% hydro-alcoholic menstruum proved to be decidedly the more efficient extraction menstruum. This information was of little aid, however, and considerable effort was then expended in isolating various pigments and other constituents for test. These efforts were apparently in the wrong direction since none of the fairly pure pigments or other non-alkaloidal constituents carried significant activity. The details of these unfruitful experiments will not be presented, because later work in a new direction completely ruled out the numerous pigments or colored constituents of ergot as carriers of oxytocic activity.

Observations up to this point appeared to justify the conclusion that a 50% hydro-alcoholic menstruum is capable of extracting every trace of active material from ergot if percolation is carried far enough. Such an extract, of course, contains much more inactive than active material, but it perhaps would provide the best starting point for the purpose involved. Accordingly, 1 Kg of the defatted ergot powder described earlier in this report was subjected to exhaustive percolation with 50% alcohol by the fractional percolation method. Percolation was discontinued when the percolate could no longer be made to give the Smith color reaction. The

A significant difference between hydro alcoholic and aqueous extracts was not revealed by this method in spite of the fact that the colorimetric method showed a higher alkaloidal content in the hydro alcoholic extracts. It follows, therefore, that the aqueous extracts exhibited an activity entirely out of proportion to the alkaloid content, as observed by Moir in humans.

One decidedly interesting bit of information is furnished by these results. The only two preparations which proved totally inactive, even in ridiculously high doses, *were likewise the only two preparations for which a color reaction could not be obtained*, regardless of how much of each preparation was used for the color test. This point was critically investigated because the only two preparations failing to exhibit activity were those which actually proved to be completely alkaloid-free. It is very important to note that ergot preparations failing to give the color reaction, when the amount of preparation specified by Smith or by the B P Modification is used, actually need not be alkaloid-free. Good color reactions are obtained by

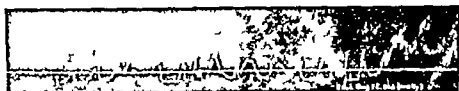


Fig 8—Cat late pregnancy uterus *in situ*. Showing lack of significant activity of "Alkaloid free" F E No 365 in very large oral dose (5.0 cc with water). Note also the prompt and intense effect following the 2.0 cc oral dose of the original F E No 365 (from which the "Alkaloid-free F E" was prepared) given over three hours later. Time in minutes.

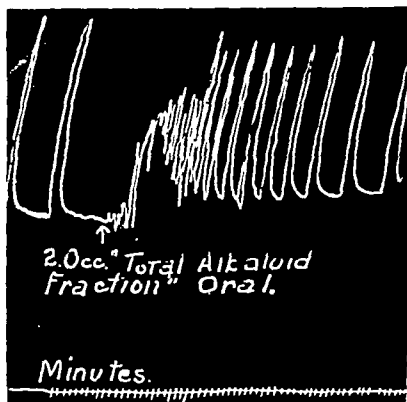


Fig 9—Cat late pregnancy uterus *in situ*. The prompt response following the oral administration of 2.0 cc of "Total Alkaloidal Fraction" in 10 cc water prepared from F E No 365.

this method only when the alkaloidal content of the preparation at least approximately approaches the level specified by the U S P or the B P. To prove actual freedom from alkaloids, approximately four or more times the usual amount should be used, the ether extract should be concentrated to less than the usual volume, and the acid aqueous extraction should likewise be reduced to about one-fourth the usual volume. Then when the reagent is added, and no color develops, one can conclude that the preparation is actually alkaloid-free for research purposes. These facts were kept in mind in obtaining the alkaloid values of Table I, the colorimetric readings being taken only when the intensity of color for standard and unknown was brought within plus or minus 20% of each other by using appropriate amounts of the preparations to be tested.

Histamine, tyramine and acetyl choline did not contribute to the valuable activity of ergot preparations, as was concluded by the writer (6) in 1930, and by Moir (5) in 1932.

THE EFFECT OF ERGOT PREPARATIONS UPON NORMAL PREGNANT CATS

Every ergot preparation included in Table I caused abortion within 36 hours in at least one pregnant cat, when given orally by stomach tube in large but non lethal doses, *except histamine, tyramine, acetyl choline and the two preparations which proved to be alkaloid free*. The latter two preparations were without effect even in relatively enormous doses by either oral, subcutaneous or intramuscular administration, but those cats which failed to abort were subsequently (after three days or more) caused to lose their young by the administration of one of the other crude extracts or one of the salts of ergotamine or ergotoxine. Large necrotic abscesses were invariably produced by the subcutaneous administration of the larger doses of the crude extracts. By this method, therefore, it has been determined that the available salts of ergotoxine and ergotamine are decidedly active orally or parenterally. Likewise, hydro alcoholic and aqueous extracts were decidedly active orally or parenterally unless they were alkaloid free as determined colorimetrically. This method does not permit of a critical comparison between the salts of ergotoxine and ergotamine and the active crude extracts, because all induced abortion in an apparently similar manner.

Ten mg of histamine acid phosphate, 50 mg of tyramine hydrochloride or 20 mg of acetyl choline, given individually or all in the same dose, by stomach tube, were ineffective in causing abortion (5 experiments).

The results of the investigation up to this point completely agreed with Moir's conclusion that the available salts of ergotoxine and ergotamine are not carriers of the full oxytocic activity of ergot. But inasmuch as it was possible to demonstrate the presence of alkaloids by their color reaction in every specimen which had proved active on either anesthetized or unanesthetized pregnant cats, it appeared quite probable that either the activity was completely due to the "total alkaloids" in some form or other, or else that the new unidentified non-alkaloidal "Moir principle" had disappeared with the alkaloids in the two inactive preparations.

THE DETERMINATION OF THE EXISTENCE AND CHEMICAL NATURE OF A NEW HIGHLY IMPORTANT SUBSTANCE IN ERGOT

Extracts of ergot were prepared by using alcohol, ether, chloroform, acetone and other organic solvents. All preparations, administered after removal of the solvent, were active in varying degrees upon unanesthetized and anesthetized pregnant cats. The activity invariably proved to be of the "prompt new type" rather than the "delayed ergotoxine or ergotamine type". A 50% hydro-alcoholic menstruum proved to be decidedly the more efficient extraction menstruum. This information was of little aid, however, and considerable effort was then expended in isolating various pigments and other constituents for test. These efforts were apparently in the wrong direction since none of the fairly pure pigments or other non-alkaloidal constituents carried significant activity. The details of these unfruitful experiments will not be presented, because later work in a new direction completely ruled out the numerous pigments or colored constituents of ergot as carriers of oxytocic activity.

Observations up to this point appeared to justify the conclusion that a 50% hydro-alcoholic menstruum is capable of extracting every trace of active material from ergot if percolation is carried far enough. Such an extract, of course, contains much more inactive than active material, but it perhaps would provide the best starting point for the purpose involved. Accordingly, 1 Kg of the defatted ergot powder described earlier in this report was subjected to exhaustive percolation with 50% alcohol by the fractional percolation method. Percolation was discontinued when the percolate could no longer be made to give the Smith color reaction. The

combined percolates were concentrated, without heat, under high vacuum to 1000 cc. The material was in contact with nothing but glass-ware at any time. The resulting deeply colored material was acid to litmus, and was essentially aqueous because all but traces of the alcohol had been removed during concentration.

This material was highly active as shown by its induction of abortion in three pregnant cats following 0.5-cc oral dosage. It possessed the characteristic "prompt" type of oral activity as shown by three experiments upon lightly anesthetized cats, an example of which is illustrated in the tracing of Fig. 6. By the epinephrine-inhibition isolated rabbit uterus method, a total alkaloidal equivalent of 2.87 mg. ergotoxine ethanesulphonate per cc. was determined. This material was designated as Fluidextract No. 365.

It was reasoned that if the belief of Moir and Dale (5) that the total alkaloidal fraction did not carry the full activity of the drug were correct, the above fluid-extract should show a great deal of activity after complete chemical removal of the alkaloidal fraction.

Complete removal of the "total alkaloids" was accomplished by slightly alkalinizing (to litmus) 500 cc. of the Fluidextract No. 365 by cautious admixture with finely powdered sodium carbonate, and exhaustively "shaking out" with many portions of ether, until the deeply colored aqueous fraction could no longer be made to yield the Smith color reaction, thus showing complete freedom from alkaloid. The deeply colored aqueous fraction was subjected to vacuum to remove residual ether. This alkaloid-free aqueous material, 500 cc. in volume, was designated as the "Alkaloid-Free Fraction."

The combined ether portions were concentrated to a volume of 500 cc., under vacuum without the aid of heat. All operations were carried out in the dark. The 500-cc. ethereal extract was then exhaustively extracted in a separatory funnel with many small portions of 1% aqueous tartaric acid solution until the Smith color reaction could no longer be obtained when final portions of the tartaric acid extract were reduced to one-fourth the volume and the aldehyde reagent added. The ethereal portion which had thus been completely exhausted of alkaloids, was placed under vacuum to remove the ether and the small amount of residue was incorporated in the "Alkaloid-Free Fraction."

The acid aqueous solution of the total alkaloids was reduced to a volume of 500 cc. by high vacuum, filtered and the small amount of precipitate (color negative) was incorporated in the "Alkaloid-Free Fraction." At this point the solution of total alkaloids still carried a pale yellow color. It was, therefore, purified by again alkalinizing with sodium carbonate and exhaustively shaking out with ether. The aqueous residue, after removal of the dissolved ether, proved completely inert on the uterus of both the anesthetized and unanesthetized pregnant cat in two divided oral doses totalling 50 cc., and was therefore discarded. The ethereal solution of the total alkaloids after reducing the volume to 500 cc. *in vacuo*, was washed several times with 0.5% sodium carbonate solution to remove most of the remaining pale yellow color. The sodium carbonate washings were unable to yield the color reaction and were completely inert, after neutralizing with HCl, upon oral administration to two pregnant cats in doses totaling 50 cc. These washings were therefore discarded. The washed ethereal solution of the total alkaloids was then again exhaustively extracted with small, divided portions of 1% aqueous tartaric

acid solution until all of the "total alkaloids" were contained in the acid aqueous solution (using the colorimetric test as the guide) The ether was again removed from the alkaloid-free ether fraction *in vacuo*, and the residue incorporated with the "Alkaloid-Free Fraction"

The purified aqueous tartaric acid solution was freed from dissolved ether and concentrated to 500 cc *in vacuo* without heat, and filtered rapidly in the dark The resulting product was absolutely clear and colorless It should have contained essentially nothing but a solution of the "total alkaloids" of ergot in the form of their tartrates This aqueous solution of the "total alkaloids" was designated as the "Total Alkaloid Fraction"

The diagram of Fig 7 illustrates precisely what was done by the above chemical procedure to obtain the "Alkaloid-Free Fraction," containing essentially all of the extractives of ergot except the 'total alkaloids,' and the 'Total Alkaloidal Fraction' which contained essentially none of the extractives of ergot except the 'total alkaloids' in the form of their corresponding tartrates

THE PHARMACOLOGIC ACTIVITY OF THE "ALKALOID-FREE FRACTION"

(a) *On the Cockscomb*—Doses as high as five times the "threshold dose," or up to 30 cc per Kg, failed to produce a cyanotic reaction in the combs of a series of ten cockerels meeting U S P X specifications (as given under "Fluidextract of Ergot") The "Alkaloid-Free Fraction" was, therefore, concluded to be inert by this method of test

(b) *On the Isolated Uterus of the Virgin Guinea Pig*—Activity equivalent to 0.15 mg of histamine per cc was determined by this procedure The quality of activity was similar to that of histamine and was of a similarly transitory nature The activity was entirely similar to that described earlier by the writer (7, 8)

(c) *On the Carotid Blood Pressure of the Anesthetized Dog*—By intravenous administration, a transitory depressor effect similar to that produced by histamine was observed The character of the tracings was essentially identical with those reproduced in an earlier publication (9) The amount of histamine like activity was found to be, within the limits of experimental error, the same as observed on the isolated guinea pig uterus

(d) *By the Epinephrine Inhibition Isolated Rabbit Uterus Method* (2)—No activity could be demonstrated by this method

(e) *On the Uterus in Situ of the Anesthetized Pregnant Cat by Oral Administration*—Using the same technique described earlier in this report, no uterine activity was observed in four experiments, even after a total of 50 cc of the 'Alkaloid-Free Fraction,' representing 50 Gm of the original ergot, was administered to each cat during two and one-half hours Each experiment was terminated after four hours or more by administering orally a dose of 10 cc of the original unfractionated fluidextract This produced significant uterine activity within ten minutes in each case, showing that failure of the "Alkaloid Free Fraction" to induce activity was not due to unresponsive uteri Illustrated by Fig 8

(f) *On Unanesthetized Normal Pregnant Cats*—Oral doses up to 30 cc failed to interrupt pregnancy in eleven cats Two of the cats littered within four days after medication, but it is believed that the delivery was not brought on by the medication, as all of the young were born alive and fully developed In abortion induced by large doses of ergot the young are born dead unless the pregnancy is in the terminal stages The cats appeared to remain free from any other symptoms following even the largest oral doses

Subcutaneous doses of ten to fifteen cc failed to interrupt pregnancy in eight pregnant cats In the course of a week or ten days, enormous necrotic abscesses invariably developed around the site of injection These abscesses healed with extreme difficulty, requiring the passage of many weeks before spontaneous healing was complete Large scars remained after the healing

It is concluded from the above pharmacologic studies on the "Alkaloid-Free Fraction" that no significant valuable uterine activity of any kind was contained

in this fraction The pharmacodynamic activity observed upon the isolated guinea-pig uterus and upon the blood pressure of dogs is of a histamine-like character, is inactive orally, and contributes nothing of a desirable nature to the characteristic action of ergot

This eliminates all of the deeply colored constituents as well as a large amount of other non-alkaloidal components of ergot as carriers of the activity of this drug The fact that this fraction is completely inert upon the uterus of the pregnant cat, while still containing constituents capable of causing severe irritation in small doses and enormous slow-healing abscesses from large doses by parenteral injection, is an important observation Complete exclusion of these constituents from ergot preparations intended for hypodermic use is very necessary It is believed that the abscess formation is probably due simply to the non-dializable or non-absorbable nature of the material, thus creating an effect similar to that caused by any irritant, unabsorbable body inserted under the skin or into the muscle tissue

THE PHARMACOLOGIC ACTIVITY OF THE 'TOTAL ALKALOIDAL FRACTION'

(a) *On the Cockscomb*—Following essentially the U S P procedure in applying this method, using ergotoxine ethanesulphonate as the standard, this fraction was intensely active in causing cyanosis of the combs of ten cockerels An activity corresponding to the equivalent of not less than 2.0 mg, and not more than 3.0 mg of ergotoxine ethanesulphonate per cc was determined

(b) *On the Isolated Uterus of the Virgin Guinea Pig*—This fraction was definitely active by this method Doses of 0.02 cc to 0.2 cc in 100-cc tissue chambers induced strong contractions It was impossible to assign any definite value in terms of a standard because repeated dosage to the same uterine strips produced progressively decreasing responses, showing that the drug gradually induced a paralysis and that this effect could not be washed out with sufficient ease to permit of any accurate estimation The action was similar to that described for ergotoxine, ergotamine and crude extracts in a previous report (7)

(c) *On the Carotid Blood Pressure of Anesthetized Dogs and Cats*—A definite and prolonged pressor response was obtained in both dogs and cats by intravenous administration of 0.01 to 0.06 cc per Kg body weight The response was indistinguishable from that illustrated in Figs X and X-a, or as described for the "specific alkaloids" in an earlier report (9) Repeated dosage invariably led to a progressively decreasing response until the well known "epinephrine reversal" effect could be produced

Oral doses of 1.0 cc, diluted to 20 cc with warm water, failed to cause a significant change in the blood pressure of a cat The pressor action, therefore, appears to be dependent upon the sudden appearance of relatively large amounts of the alkaloids in the circulation

(d) *By the Epinephrine-Inhibition Isolated Rabbit Uterus Method (2)*—The potency by this method was found to be equivalent to 2.56 mg of ergotoxine ethanesulphonate per cc It will be noted that this value agrees fairly well with the value obtained, by the same method, for the original Fluidextract No 365, from which this 'Total Alkaloidal Fraction' was prepared The difference in the two values is barely significant, and shows that the loss in alkaloidal activity sustained in the chemical fractionation procedure was not great

(e) *On the Uterus, in Situ, of the Anesthetized Pregnant Cat by Oral Administration*—After 31 experiments, following the technique already described, the writer is convinced that this "Total Alkaloidal Fraction," as well as three others prepared similarly, contained all of the significant characteristic uterine activity of ergot The uterine effects usually developed well within ten minutes differing from salts of ergotoxine or ergotamine in this respect Figure 9 illustrates the promptness of action following oral administration of the 'Total Alkaloidal Fraction' The promptness in action was indistinguishable from that observed following the administration of the original Fluidextract No 365, from which this fraction was obtained The promptness of action does, however, clearly show that the "total alkaloids" include a very important member in addition to ergotoxine or ergotamine

(f) *On Unanesthetized Normal Pregnant Cats*—The "Total Alkaloidal Fraction," in oral doses of 0.5 to 2.0 cc., interrupted pregnancy within 24 hours, in twelve cats in various stages of pregnancy. Subcutaneous or intramuscular doses of 0.25 cc. (4 cats by each injection route) likewise proved effective in terminating pregnancy. The young in all cases were born dead. Death of the cat occasionally resulted after abortion in experiments of this type, whether the preparation given was the "Total Alkaloidal Fraction," salts of ergotoxine or ergotamine, or any one of the active aqueous or hydro-alcoholic extracts. This was to be expected since most of the doses administered throughout this work were large.

The foregoing experiments upon the "Alkaloid-Free Fraction," and the "Total Alkaloidal Fraction," again demonstrate, as the writer previously concluded (7), that the isolated guinea-pig uterus method, as it is usually applied, is wholly unreliable as a means of evaluating the significant activity of ergot preparations, measuring chiefly the extremely variable and totally useless histamine type of activity rather than the alkaloidal activity.

GENERAL ANALYSIS OF RESULTS

Moir's observations upon human patients to the effect that, given orally, both aqueous and hydro-alcoholic extracts of ergot produce a much more prompt and more effective uterine action than the available salts of ergotoxine or ergotamine, have been repeatedly confirmed in this study upon pregnant cats. It follows, therefore, that the crude extracts owe their superior activity either (a) to an entirely new unidentified substance as concluded by Moir, or (b) to a naturally existing unknown ergotoxine or ergotamine compound or combination differing from the available salts or ergotoxine and ergotamine, and which is more readily absorbed from the intestinal tract than the manufactured alkaloidal salts. The writer feels that "(b)" had to be considered as a possibility in spite of the fact that Moir believed his active aqueous extracts to be practically alkaloid-free, because evidence has been presented in this as well as in an earlier report (8) showing that such extracts, although containing a deficiency of alkaloids, are usually not actually alkaloid-free and that they may contain sufficient alkaloids to account for definite activity when administered to humans in large doses as used by Moir.

A further analysis of the present results, however, rather definitely rules out "(b)" as a possibility, because of the repeatedly demonstrated fact that the "Total Alkaloidal Fraction" contained every trace of the characteristic activity of the original quantitative de-alcoholized hydro-alcoholic extract. Specifically, this "Total Alkaloidal Fraction" could consist of essentially nothing but an acid solution of the "total specific alkaloids," and these obviously in the form of their corresponding tartrates. This should preclude the possibility that the crude extracts owed their superior oral activity to a "mysterious" salt, or combination, of the two important well-known alkaloids ergotoxine or ergotamine, in spite of the fact that neither of these alkaloids have ever been proved to exist as such, or as simple salts, in crude extracts or ergot itself.

This leaves only "(a)" as a possibility. Their possibility developed into a virtual certainty when it was observed that salts of ergotoxine and ergotamine fell far short of being completely representative of the "total alkaloidal" activity of ergot, and also that the only other known important pharmacodynamically active constituents, namely, histamine, tyramine and acetyl choline, were not responsible for any of the characteristic oral activity of the drug. It may be concluded,

therefore, that Moir's and Dale's belief that a new highly important unidentified substance exists in ergot and its crude extracts (both aqueous and alcoholic), is confirmed by these studies. Quite contrary to their apparent belief, however, this new substance is shown to behave characteristically as an alkaloid, since the studies here reported show the presence of this new substance in the completely colorless "Total Alkaloidal Fraction," while the "Alkaloid-Free Fraction" proved to be devoid of any oral or subcutaneous activity of any significant type. The writer, therefore, believes that this new substance must be classified chemically as a new member of the "total specific alkaloids" of ergot, and that the activity of aqueous extracts, observed by Moir in human patients, is to be ascribed to "residual alkaloid."

(To be continued)

ANTIDOTES I GENERAL PLAN *

BY JAMES C MUNCH, AND F E GARLOUGH ¹

Men from the earliest times have endeavored to find ways of relieving pain or injury to themselves by means of spirits, charms, mysticism, and later by use of herbs and animals. In these efforts they found some herbs and later extracts that were either beneficial or deadly. It was also observed that the animals were either beneficially or injuriously affected by certain plants or animals which they ate, as is reflected in the names—cowbane, sowbane and wolfbane which are plants poisonous to cattle, swine and wolves.

The fatal effects resulting from the bites of animals brought about the first real effort to find antidotes to poisons, though some earlier knowledge had been gained of the counter-action of one drug upon another. In Homer's "Iliad" describing the Trojan War and the adventures of ancient heroes (Ca 1000 B C) many references are made to the wounds of the warriors being rubbed with a bitter, pain-assuaging root. Homer mentions 250 such cases. The earliest reference to a plant which was specifically believed to be an antidote for poison is found in Homer's "Odyssey," "Moli" or "Molu" which is apparently a species of *Allium* (*Allium moly*). In this case Circe's potion was a form-transforming drug, the effects of which moly supposedly counteracted.

Among the earlier writers on antidotes was the Greek, Nicander of Colophon (185-135 B C), the Court Physician to Attalus, King of Pergamum, who made studies of poisons on condemned criminals, a common practice at that period. His first work, "Theriaca," which was written in Greek verse, had to do with the poisons of animal bite and treatments of them. His second poem, "Alexipharmaca," tells of antidotes to poisons. In these he mentions twenty-two poisons, including aconite, cantharides, opium and conium. His chief antidotes include warm oil, mallow and linseed tea to excite vomiting.

The development of antidotes to poisons was greatly stimulated when, about the time of Mithridates (first century B C), poisons began to be extensively used

* Scientific Section. Madison meeting, 1933

¹ Bureau of Biological Survey, Glen Olden, Pa., and Denver, Colo.

by certain ambitious or revengeful people to remove enemies or persons in the way of their personal advancement. The early effort was to develop a composite mixture of plant and animal materials that would protect against all poisons, bites of venomous animals and diseases. Several were put up in small cake or tablet form. A number of famous "theriaca," as the mixtures were called, were developed, containing from 37 to 250 ingredients guaranteeing protection. Mithridatium and two modifications of it were noted ones and appeared in the London Pharmacopœia as late as 1677 A D. A red clay, "terra sigillata," which was excavated with much ceremony from a certain hill on the Island of Lemnos on August 6th of each year was given some attention. Tests in July 1580, showed that such a product saved the lives of dogs given lethal doses of mercury sublimata, aconite, apocynum or neriium! Subsequent reports of tests on condemned criminals, however, failed to show any more value for this product than for the unicorn's horn.

William Heberden (1710-1801) in his "Essay on Mithridatium and Theriaca" (1745) did much to expose the superstitions and worthlessness of these curious concoctions, and to banish them from the pharmacopœias. Antidotal studies since have been upon a more scientific basis.

A series of investigations have been made on various poisons by interested investigators. Some trials have been made on animals, some on humans. A great deal of information has been collected and has served as a basis for the preparation of various tables of antidotes. However, our search of the literature has failed to show any consistent study of several types of poisons under similar conditions. It was, therefore, deemed advisable to institute a detailed investigation along this line, with the hope of developing successful methods of treatment of men and animals.

Since the literature reveals enormous discrepancies in toxicity figures, we have repeated many determinations to establish authentic figures. Injections are given various laboratory animals, worms, fish, frogs, mice, rats, rabbits, cats and dogs by mouth, subcutaneously, intramuscularly, intraperitoneally or intravenously. We are also collecting recorded toxicological data for men.

Searches of the literature are being made to learn the suggested antidotes. Pharmacological and toxicological studies are made to serve as a rational basis for therapeutics. Based on this knowledge, the efficiency of various procedures for protecting against the fatal dose, and multiples of the fatal dose are being studied. Studies are being made of antidotal processes that may change the chemical nature of the poison, or prevent its absorption, or aid its elimination, or counteract its physiological effects, so as to save the life of a poisoned animal. In our present studies we are paying most attention to those poisons (strychnine, thallium, cyanides, arsenic and phosphorus), used in the control of noxious rodents and predatory animals.

CONCLUSIONS

(1) Detailed searches of the literature are being made to determine the lethal doses of various poisons for men and animals, also their antidotes.

(2) Laboratory studies are being made to learn the value of various procedures suggested in the literature or developed in our work.

BIBLIOGRAPHY OF PHARMACEUTICAL RESEARCH

Compiled by A G DuMez, Reporter on the Progress of Pharmacy

All articles in these lists will be presented in abstract form in the bound volumes of the Year Book, which is issued annually. Those desiring abstracts immediately can obtain them for a fee of one dollar each by communicating with A G DuMez, University of Maryland, School of Pharmacy, N W cor Lombard and Greene Sts, Baltimore, Maryland

Christie, John
Pharmacy in Soviet Russia
Chem & Drug, 121 (1934), 642

PHARMACEPŒIAS AND FORMULARIES

Anon
Practical Questions on the Swiss Pharmacopœia V
Schweiz Apoth-Ztg, 72 (1934), 732
Gardner, John H
A note on the U S P monograph on chrysarobin
Jour A Ph A, 23 (1934), 1177
Potjewijd, T
Review of the Hungarian Pharmacopœia IV
Pharm Weekblad, 71 (1934), 1322
Potjewijd, T
Review of the Jugoslavian Pharmacopœia 1933
Pharm Weekblad, 71 (1934), 1385

APPARATUS AND MANIPULATIONS

Anon
A small tube-filling apparatus
Apoth-Ztg, 49 (1934), 1607
Husa, William J, and Magid, Louis
Drug extraction I A study of various menstrua from the standpoint of swelling effects, penetration and extraction
Jour A Ph A, 23 (1934), 1187
Konrich
On the application of the autoclave to sterilization in pharmacies
Apoth-Ztg, 49 (1934), 1536
Rupp, E
Small drying oven for analysis
Pharm Ztg, 79 (1934), 1249
Zimmermann, W
Drop bottle shapes and certainty of medicinal dosage
Apoth-Ztg, 49 (1934), 1604

PHARMACEUTICAL PREPARATIONS

Alpers, H
Osterberg's Drops
Apoth-Ztg, 49 (1934), 1625

Anon
Waving and setting lotions
Pharm J, 133 (1934), 653
Ansingh, E W
Difficulties with one per cent iodinated vaseline
Pharm Weekblad, 71 (1934), 1388
Atkins, Frank
Pearliness in creams
Perf & Ess Oil Rec, 25 (1934), 332
Bartole, A
Iodotannic syrup
Science farm, 1 (1933), 29, through *Chem Abstr*, 28 (1934), 3525
Bauer, K H, and Junge, R
On the knowledge of the scammony resins
Arch Pharm, 272 (1934), 841
Bobranski, B
Some remarks on the preparation and properties of "Mentholum valerianicum"
J Pharm et Chim, 20 (1934), 437
Brandrup, W
On the application of pectins in pharmaceutical practice
Pharm Zentralh, 75 (1934), 777
Brandrup, W
Preparation of liniments with volatile oils
Pharm Ztg, 79 (1934), 1262
Casparis, P
Incompatibility of dimethylamino-antipyrine
Schweiz Apoth-Ztg, 72 (1934), 695
Clayton W, et al
Symposium on emulsions
Chem & Drug, 121 (1934), 732
Merz, K W
Spirit of ethyl nitrite
Apoth-Ztg, 49 (1934), 1553
Rothenkirchen O
On ammoniated liniment, D A B VI
Pharm Ztg, 79 (1934), 1194
Toni Giuseppe
A new method for preparing tincture of strophanthus
Arch farmacol sper, 57 (1934), 161, through *Chem Abstr*, 28 (1934), 5595

PHARMACOLOGY, TOXICOLOGY AND
THERAPEUTICS

Anon

Vitamin standardisation Report of the Second
International Conference*Pharm J*, 133 (1934), 594

Bodendorf, K

Contribution to the history of local anesthesia
in the *p*-aminobenzoic acid ester series*Apoth-Ztg*, 49 (1934) 1642

Freudweiler, R

Organotherapy in pharmaceutical practice

Pharm Acta Helv, 9 (1934), 216

Galloway, L D

Effect of oils, fats and waxes on antiseptic
action*Mfg Chemist*, 5 (1934), 233-234, through *J**Soc Chem Ind* 53 (1934), 1036B

Hurst, Arthur F

Dosage above the pharmacopoeial maximum

Pharm J, 133 (1934), 675, 703

Jurst, A E, and Christiansen, W G

Fluctuations in the resistance of rats to neo-
arsphenamine as observed in routine toxicity
tests over a period of four years*Jour A Ph A*, 23 (1934), 1171Kanter, A E, *et al*A new biologic test for hormones in pregnancy
urine*J A M A*, 103 (1934) 2026

Kindler, K

The significance of amines in chemotherapy

Arch Pharm, 272 (1934), 811

Lingle Robert M

The assay of ointment of boric acid

Am J Pharm, 106 (1934) 421

Munch, James C

Saliva tests II Heroin

Jour A Ph A, 23 (1934), 1185

Regnier M-T

Antitoxic power of glutathione in hydrogen
cyanide poisoning*J Pharm et Chim* 20 (1934) 501

Rosen, Harry

The bioassay of squill

Jour A Ph A, 23 (1934) 1180

Steghitz, Edward J, and Knight, Alva A

Sodium ferrocyanide as a clinical test of
glomerular efficiency*J A M A*, 103 (1934), 1760

Stone Charles H, and Margolis, Julius

Granulopenia following Allonal

J A M A, 103 (1934), 1933

Taylor A L

The oral administration of calcium

Pharm J, 133 (1934), 620

Underhill, S W F

Clinical applications of vitamin studies

Pharm J, 133 (1934), 591

Van Liere, Edward J, and Crisler, George

The effect of digitalis on acute cardiac dilata-
tion produced by Anoxemia*J Pharmacol & Exper Therap*, 52 (1934), 408

VEGETABLE AND ANIMAL DRUGS

Argall, C B K

Japanese pyrethrum, its history, cultivation,
uses and sales*Chem & Drug*, 121 (1934), 750

Freise, F W

Deterioration of drugs with duration of storage
and mode of packing*Chem-Ztg* 58 (1934), 853-854, through *J**Soc Chem Ind*, 53 (1934), 1083B

Jaretsky, R, and Ulbrich, H

Intracellular changes in the formation of gum
in the seeds of *Linum usitatissimum* and
*Althaea officinalis**Arch Pharm*, 272 (1934), 796Kondo, H, *et al*

Investigation of Lycoris alkaloids

J Pharm Soc, Japan, No 633 (1934), 194

Kondo, Y

Identification of drugs by means of their ash
pictures*J Pharm Soc, Japan*, No 633 (1934), 211

Kondo, Y

Supplement to the ash pictures of important
drugs of the Japanese, German and Austrian
Pharmacopœias*J Pharm Soc, Japan*, 632 (1934), 179

Kondo, Y, and Kawamura M

Ash pictures of important poisonous drugs

J Pharm Soc, Japan, No 633 (1934), 217

Lendner, A

A frequent falsification of pepper

Pharm Acta Helv, 9 (1934), 224

Lundsgaard Einar, and Schou, Aage

Hormones and hormone preparations

Arch Pharm og Chem, 41 (1934), 720, 760

Munesada T

Pharmacognostic researches of Japanese drugs
of the geranium family*J Pharm Soc Japan* No 633 (1934), 187

Noguchi Takemi

Contribution to the knowledge of the con-
stituents of "Sen Kyu"*J Pharm Soc Japan*, No 632 (1934), 171

Oester, Y Thomas

An investigation of *Gleditschia Triacanthos*
(Linné)*Jour A Ph A*, 23 (1934), 1198

- Ogata, A and Hirano, S
Study of the male hormone VI, VII
J Pharm Soc, Japan, No 633 (1934), 199, 227
- Sattler O H
On Capsicum
Pharm Zentralh, 75 (1934), 778
- Stellfeld, Carlos
Berberis laurina as a substitute for *Hydrastis canadensis*
Tribuna farm 2 (1934) 142, through *Chem Abstr*, 28 (1934) 5598
- Tatzel I
The significance of school gardens with respect to the production of inland spice and drug plants
Pharm Post, 67 (1934), 627
- ALKALOIDS AND GLUCOSIDES
- Beaune, A
Pharmacodynamic comparison of several heart-active glucosides (ouabain, *k*-strophanthun, convallamarin, cymarín)
Bull sci pharmacol, 41 (1934) 590
- Bermond A
Totaquina
Bull sci pharmacol, 41 (1934), 614
- Chessa, G
The stabilization of the active principles of digitalis
Arch farmacol sper, 57 (1934), 96, through *Chem Abstr*, 28 (1934), 4173
- Deltour P
Quantitative determination of morphine in opium
Pharm Tijdschr, 12 (1934), 169
- Frangoules, J, and Basileios, A
Investigation and determination of free acid in acid salts of quinine
Praktika, 7 (1932), 293, through *Chem Abstr*, 28 (1934), 5175
- Greifinger, S
Studies on the saponins of *Chenopodium ambrosioides* L
Wiadomosci Farm, 61 (1934) 275, through *Chem Abstr* 28 (1934), 4839
- Jatridos, D
Determination of total alkaloids in cinchona bark
Praktika, 7 (1932), 281, through *Chem Abstr*, 28 (1934), 4835
- Leoncini, G
New color reactions for the differentiation of salgenin and phloretin from their glucosides
Boll ist super agrar Pisa, 9 (1933) 530, through *Chem Abstr*, 28 (1934), 4535
- Manske, R H F
Alkaloids of fumariaceous plants IX. *Dicentra formosa*, Walp
Can J Research, 10 (1934), 521, through *Chem Abstr*, 28 (1934), 4537
- Manske, R H F
Alkaloids of fumaraceous plants X *Dicentra oregana* Eastwood
Can J Research, 10 (1934), 765, through *Chem Abstr*, 29 (1934), 5179
- Milshtein, A, Zhukhovitzka, E, and Rosenberg, H
Determination of quinine and antipyrine in a mixture
Farm Zhur (1934), 64, through *Chem Abstr*, 28 (1934), 5598
- Offerhaus, C, and Baert, C G
Anesthetics with special reference to cocaine and novocaine
Pharm Weekblad, 71 (1934), 1337, 1364
- Opienska-Blauth, J
Determination of strophanthun in the seeds and extracts of strophanthus
Arch Chem Farm, 1 (1934) 29, through *Chem Abstr*, 28 (1934), 4538
- Orelkov, A P
Study of alkaloids of the *Berberis heteropoda*
Khim Farm Prom, No 1 (1934), 19, through *Chem Abstr*, 28 (1934), 5598
- Regnier, J, and David R.
On the preservation of cocaine after sterilization
Bull sci pharmacol, 41 (1934) 595
- Sanchez, J A
New test for procaine and a new procedure for determining procaine and stovaine
Ann chim & anal chim appl, 16 (1934) 249 through *Chem Abstr*, 28 (1934), 4836
- v Klobusitzky, D
A micro method for the determination of different strychnine salts
Biochem Z 270 (1934), 120, through *Chem Abstr*, 28 (1934) 4837
- Van Esveld L W
Chloretone as a preservative for epinephrine solutions
Pharm Weekblad, 71 (1934), 131d
- Vita, G, and Bracaloni, L
Composition and different amorphous iodobismuthates of quinine prepared according to the method of Francois and Seguin
J Pharm et Chim 20 (1934), 512
- Wenusch A, and Bilowitzki, G
Determination of anabesine
Biochem Z, 270 (1934) 15 through *Chem Abstr*, 28 (1934) 4837

Willstaedt, H

Detection and determination of procaine

Biochem Z, 269 (1934), 182, through *Chem Abstr*, 28 (1934), 4176

OILS, FATS AND WAXES

Vanin, I I, and Chernoyarova, A A

Fatty and essential oils from *Coriandrum sativum* grown in the Northern Caucasus
J Applied Chem, 6 (1933), 922, through
Chem Abstr, 28 (1934), 3833

ESSENTIAL OILS

Brodskii, B

Camphor from *Ocimum basilicum*

Khim Farm Prom, No 1 (1934), 42, through
Chem Abstr, 28 (1934), 5599

Muller, A

Surface tension of essential oils

Helv Chim Acta, 17 (1934), 1135-1142, cf
C A (1932), 803, through *J Soc Chem Ind*, 53 (1934), 1117B

Scholz, G

The determination of volatile oils in drugs

Apoth-Ztg, 40 (1934), 1690

Schwarz, M A

Determination of aldehydes in essential oils

Ann chim applicata, 24 (1934) 352-355,
through *J Soc Chem Ind*, 53 (1934),
1036B

Wasicky, R, and Gmach, E

Macro- and micro-toxicological detection of cineol

Monatsbeilage Pharm Presse, 5 (1934), 113

ANALYTICAL METHODS AND RESULTS

Csiple, Z

Evaluation of lead-containing plasters and liniments

Magyar Gyóg Társ Ért 10 (1934) 292,
through *Chem Abstr*, 28 (1934), 5177

Källström, K

Copper determinations in iron-copper medicinal

Scensk Farm Tid, 38 (1934), 185, through
Chem Abstr, 28 (1934), 4177

Leymarie, J

A practical procedure for the determination of moisture in pharmaceutical and food products II Applications

J Pharm et Chim, 20 (1934), 443

Nobili, G

Activity of commercial pepsins of standard 1 100 Testing of albumin and control of peptonizing power

Boll chim-farm, 73 (1934), 677-680, 719-724,

through *J Soc Chem Ind* 53 (1934), 1117B

Oakley, Margarette, and Krantz, John C Jr
A note on the arsenic test for reduced iron

Jour A Ph A, 23 (1934), 1196

Palfrey, L, Sabetay, S, and Sontag, D

A new number applicable to aldehydes
Cannizzaro number Application to the assay of oil of bitter almonds

Chimie & industrie (April 1934) 863
through *Chem Abstr*, 28 (1934), 5927

Piper, C S

The volumetric determination of potassium by the cobaltinitrite method

J Soc Chem Ind, 53 (1934), 392T

Renaudin, J, and Renaudin, J

On the microdeterminations by iodimetry

J Pharm et Chim, 20 (1934) 516

Schulck, E, and Floderer, I

Determination of mercury in medicinal preparations

Magyar Gyóg Társ Ért, 10 (1934) 147-159,
Chem Zentr 1 (1934), 2459, through *J Soc Chem Ind* 53 (1934), 1083B

Siegfried, K

Bellier's reaction of the Swiss Pharmacopœia V
Pharm Acta Helv, 9 (1934), 211

Thomann J

Determination of vioform in surgical dressings
Pharm Acta Helv, 9 (1934), 229

Thomis, G

Method for determining oxyhemoglobin contents of certain pharmaceuticals

Praktika, 7 (1932), 275, through *Chem Abstr*, 28 (1934), 4535

Weiss, L

Evaluation of ferrum reductum by the sublimate method

Z anal Chem, 98 (1934), 397-402, through
J Soc Chem Ind, 53 (1934), 1117B

INORGANIC AND PHYSICAL CHEMISTRY

Alpers, H

Volume relationship in magnesium oxide

Apoth-Ztg, 49 (1934), 1643

Anon

Determination of acidity in non-aqueous solutions

Pharm J, 133 (1934), 595

Branch, G E K, and Yabroff, David L

The anomalous strength of salicylic acid
J Am Chem Soc, 56 (1934) 2568

Gabel, L F

Free alkali in glass

Jour. A Ph A, 23 (1934), 1174

Geddes, John A and Bingham Eugene C

The fluidity of anisole

J Am Chem Soc 56 (1934) 2625

Malquori, G

Stability of aqueous dispersions of lecithin

Atti Congr naz chim ind, 4 (1933) 752-753,

Chem Zentr 1 (1934) 2004, through *J*

Soc Chem Ind 53 (1934) 1036B

Moser, H

Physical-chemical examination of surgical dressings I

Pharm Ztg, 79 (1934) 1303, 1316

Philbrick, Frederick Arthur

The association of phenol in different solvents

J Am Chem Soc 56 (1934), 2581

Remy E

New facts concerning physical and chemical studies of cresol soap preparations

Arch Pharm 272 (1934), 827

Ruemele T

On the knowledge of emulgators

Pharm Zentralh 75 (1934), 749

Savage R Maxwell

The absorbency of surgical cotton wool

J Soc Chem Ind 53 (1934), 379T

ORGANIC CHEMISTRY

Feist, K, and Schultz J

Action of phthalic anhydride and salicylic anhydride on 2-aminopyridine

Arch Pharm, 272 (1934), 785

Fischer, R

On identification reactions for *l*-ascorbic acid (vitamin C)

Pharm Ztg, 79 (1934), 1207

Gardner, John H

The preparation of chrysophanic acid from chrysarobin

JOUR A PH A, 23 (1934), 1178

Kogl, F

On auxin

Pharm Ztg, 79 (1934) 1272

Marion, L

Nonbasic constituents of the leaves and roots of *Adlumia fungosa* Greene

Can J Research, 10 (1934) 759, through

Chem Abstr, 28 (1934), 5178

Windaus, A, *et al*

Constitution of ergosterol

Ann, 510 (1934), 248, through *J pharm*

Belg, 16 (1934), 1034

CLINICAL TESTS

Chéramy, P, and Lobo, R

Rapid method for the identification of barbiturates in blood

J Pharm et Chim, 20 (1934), 461

ARGENTINE CONGRESS ON MEDICAL ECONOMICS

The first Congress on Medical Economics, organized by the Colegio Medico, a medical society of Buenos Aires, with the cooperation of similar medical societies of Argentina, was held in Buenos Aires. Important problems of collective medical practice were discussed. The members resolved to have a fixed tariff of fees, in relation to the economic conditions of patients who were classified as "poor," "justified to have a 60 per cent reduction in the schedule," and "able to pay the whole fee assigned in the schedule." They also resolved to have the City Hospital and similar institutions as centers for free medical care. There were various general motions, such as on the preparation of a national sanitary code. The existence of sanatoriums belonging to medical cooperative and medical mutual societies were approved. The members stated that the medical profession in Argentina is overcrowded and advised the limitation of the number of students to medical schools in

relation to the health demands of the country as well as the selection of candidates, according to their preparation and ethical background. The suppression of treaties of reciprocity with various countries was advised as an aim of securing practice for Argentine physicians, those graduated from Argentine schools as well as those returning home with diplomas from accredited schools in other countries.



Main entrance, Paris School of Pharmacy

THE STABILIZATION OF SYRUP OF HYDRIODIC ACID, U S P X

BY WILLIAM J HUSA² AND LYEEL J KLOTZ

The troublesome discoloration of hydriodic acid preparations due to liberation of free iodine was overcome many years ago by use of hypophosphorous acid. The darkening of Syrup of Hydriodic Acid due to decomposition of the sugar, however, has remained as a problem up to the present time (1). The sucrose in Syrup of Hydriodic Acid is rapidly hydrolyzed into dextrose and levulose (2), (3). Haussmann (4) ascribed the discoloration to the decomposition of the levulose formed in this inversion.

In syrups of hydriodic acid containing no hypophosphorous acid, the dextrose formed on hydrolysis of sucrose tends to reduce any free iodine formed. From this point of view sucrose has sometimes been considered as a preservative in the syrup. In Syrup of Hydriodic Acid, U S P X it would be erroneous to consider sucrose as a preservative because the hypophosphorous acid is fully effective in preventing the appearance of free iodine and the sucrose is the direct cause of the discoloration which occurs. Diluted Hydriodic Acid, U S P, will remain colorless indefinitely but as soon as sucrose is added to prepare the syrup an unstable preparation results.

From the above considerations it was thought that if Haussmann's views were correct, it should be possible to prepare a stable syrup of hydriodic acid by using hypophosphorous acid to prevent the appearance of free iodine and employing dextrose to give the preparation the properties of a syrup. Accordingly, syrups of hydriodic acid were prepared following the U S P directions with the exception that the sucrose was omitted and the following sweetening agents used: (a) dextrose, C P, 700 Gm per L, (b) dextrose, commercial,³ 700 Gm per L, (c) Glucose, U S P, 435 cc per L. The deterioration of these syrups was compared with that of a U S P Syrup of Hydriodic Acid in an accelerated test consisting of storage in an oven at 50° C in completely filled, tightly stoppered bottles. The results are shown in the following table.

As indicated in Table I, dextrose proved vastly superior to sucrose in the syrup stored at 50° C. Tests are in progress under various other conditions of storage. The C P dextrose gave a colorless syrup to start with while the commercial dextrose yielded a syrup of a slight yellow tint, the yellow color of the syrup prepared from U S P Glucose might be considered objectionable. By use of 700 Gm of dextrose per L, a product of excellent palatability was obtained.

According to present price quotations, a syrup prepared with the above quantity of commercial dextrose should cost about 3¢ more per liter than the present Syrup of Hydriodic Acid, a preparation containing C P dextrose should cost approximately 80¢ more per liter. Obviously, these slight price increases are negligible in comparison with the greater stability of the preparation.

About 35 years ago, Scoville (5) prepared samples of syrup of hydriodic acid using glucose in place of sucrose but the preparations clouded on standing. The clouding may have been due to impurities but was not observed in syrups made with any of the grades of dextrose used in the present study.

¹ Section on Practical Pharmacy and Dispensing, A. P. H. A., Washington meeting, 1934.

² Head Professor of Pharmacy, University of Florida.

³ For this we are indebted to the Penick and Ford Co., Cedar Rapids, Iowa.

TABLE I—DETERIORATION OF SYRUPS OF HYDRIODIC ACID CONTAINING VARIOUS SUGARS

Syrup Containing per Liter	Appearance of Syrups after Storage in Oven at 50° C.			
	0 Days	30 Days	60 Days	90 Days
450 Gm Sucrose (U S P Syrup)	Colorless	Yellow, contains ppt which re- dissolves on shaking	Dark brown liquid, copious black ppt which partially redissolves on shaking	Black solution, black ppt
700 Gm C P Dextrose	Colorless	Colorless	Colorless solu- tion, traces of ppt which re- dissolves on shaking	Pale yellow solu- tion, traces of ppt which re- dissolves on shaking
700 Gm Commercial dextrose	Slight yellow tint	Nearly colorless	Nearly colorless, traces of a black ppt which re- dissolves on shaking	Pale yellow solu- tion, traces of a black ppt which redis- solves on shak- ing
435 cc U S P glucose	Yellow	Yellow	Dark yellow	Very dark yellow

SUMMARY

It has been found that a Syrup of Hydriodic Acid of greatly increased stability can be prepared by replacing the sucrose in the official formula by dextrose. Dextrose of C P quality gives the best preparation although a satisfactory preparation results from the use of commercial dextrose.

REFERENCES

- (1) Husa, William J, *JOUR A PH A*, 20 (1931), 759-762
- (2) Woltersdorff, A H, and Richtmann, W O, *Pharm Archives*, 3 (1900), 81
- (3) Krantz John C, Jr, *JOUR A PH A*, 12 (1923), 967
- (4) Haussmann F W, *Am J Pharm*, 72 (1900), 217
- (5) Scoville, W L, *Drug Circ*, 43 (1899), 221

SCHOOL OF PHARMACY,
UNIVERSITY OF FLORIDA,
GAINESVILLE, FLORIDA

A STUDY OF VEHICLES FOR MEDICINES *

BY BERNARD FANTUS, H A DYNIEWICZ AND J M DYNIEWICZ

IX FRUIT SYRUPS

It may seem strange that fruit syrups, as delicious as they are and as extensively as they are employed in cooking and for the flavoring of beverages, are not used to a greater extent as vehicles for medicines. Syrup of Orange is the only U S P representative of fruit syrups prescribed under its own name, and Syrup of Citric Acid, which is really an artificial lemon syrup, the only other one in the National Formulary we have the Syrup of Raspberry.

* From the Laboratory of Pharmacology of the College of Medicine, University of Illinois

The Syrup of Wild Cherry has quite an extensive use and might be taken to represent a sort of cherry syrup. When, however, one notes the kind of "wild cherry syrup" that is being palmed off for the official preparation, which if not actually delicious is not offensive, one is not surprised that so many people detest the taking of medicine. Some of these "wild cherry syrups" are turbid, some of them have undergone fermentation so as to be sour in addition to being bitter and highly astringent.

We understand that a new formula for syrup of wild cherry is being contemplated and it is hoped that it will be a great improvement over the present one. Nevertheless we wonder whether anyone who would have a choice between a nice syrup of cherry and the best possible Syrup of Wild Cherry would not unhesitatingly choose the cherry syrup. Thus when it comes to flavoring fountain drinks no one would think of using *Syrupus Pruni Virginianæ* to prepare a delicious and refreshing drink. Then why treat medicines with the less delightful flavor and taste and make it more offensive than it needs to be? We would therefore like to see the syrup of cherry introduced in the United States Pharmacopœia or the National Formulary, so as to give it a chance to compete with the Syrup of Wild Cherry for medical favor.

Possibly the reason why fruit syrups have not been introduced more extensively in official formularies is the difficulty of securing a uniformly satisfactory standardized product. Thus, for instance, the syrup of raspberry of the National Formulary V is unsatisfactory because it introduces the variable factor of fermentation, which is relied upon to destroy the pectin. Unfortunately, quite often the fermentation advances to the stage of vinegar production while the pectin is being destroyed, spoiling thereby the fine aroma of the raspberry. At other times a different form of fermentation causes the production of a musty odor which is likewise objectionable.

We therefore believe that it is very important to control the fermentation process which destroys the pectin bodies, in such a way as to have this fermentation limit itself to this effect without producing other changes.

With this in view we have experimented extensively employing various degrees of temperature, various degrees of avoidance of exposure to air even to the extent of excluding the access of air by a layer of liquid petrolatum. We have employed taka-diastase (which was recommended for this purpose), we have tried modifying the p_H value by addition of alkali and acid, all this without entire satisfaction.

We have secured the best results by adding 0.1% of benzoic acid to the strained fruit juice and permitting the mixture to stand at room temperature until a small portion of the filtered juice remains clear when one-half its volume of alcohol is added to it.

It seems that the presence of benzoic acid permits the activity of the pectase while inhibiting vinegar and other bacterial fermentation.

Objection might be raised to the presence of benzoic acid in these fruit syrups as advocated in the subjoined formulas on the ground that the use of such preservative in food products is illegal. Granted that the use of benzoic acid to be undesirable in food products that might be consumed in unlimited quantities and for an indefinite length of time, bringing the possibility of ingestion of a toxic dose,

such danger is not present in the use of a teaspoonful or even a tablespoonful of a less than 1-2000 solution of benzoic acid, several times daily for the usually limited time that medicines are taken. A great deal might be said on the subject of the joint responsibility of the prescribing physician and the dispensing pharmacist for the keeping qualities of the medicines dispensed. An investigation of the condition of medicines after they have been kept in the patients' homes for several days or longer might result in shocking revelations and in the wish that more medicines would be thrown down the sink than be forced down the unwilling throat of a struggling babe. It is well known that the keeping quality of syrups is entirely dependent upon their concentration. It is many times necessary to employ a certain amount of water to dissolve the medicinal ingredient and, unless this quantity of water be adjusted with extreme care which is usually not given it, the syrup becomes diluted to the spoiling point. The necessity of preventing this is obvious and it is respectfully submitted that the more general employment of benzoic acid or some other preservative in medicinal syrups be given more serious consideration.

That benzoic acid may introduce incompatibility is freely admitted. This is, however, no worse than the incompatibility, *e g*, of syrup of wild cherry with iron salts.

We therefore respectfully submit the consideration of the following three formulas for admission in the United States Pharmacopœia or the National Formulary.

SYRUPUS RUBI IDÆI

Syrup of Raspberry

Syr Rub Id

Press the juice from fully ripe raspberries through a flannel cloth. Dissolve in the raspberry juice 0.1 per cent of benzoic acid, and let the solution stand at room temperature until a small portion of the filtered juice produces a clear solution with one-half its volume of alcohol. Then clarify the juice by straining through flannel cloth and paper if necessary, and add to each 450 cc of the clarified juice 850 Gm of sucrose. Dissolve the sucrose in the juice by heat on a water-bath, cool and remove the scum.

Preserve the product in well stoppered bottles in a cool and dark place.

SYRUPUS FRAGARÆ

Syrup of Strawberry

Syr Frag

Press the juice from fully ripe strawberries through a flannel cloth. Dissolve in the strawberry juice 0.1 per cent of benzoic acid, and let the solution stand at room temperature until a small portion of the filtered juice produces a clear solution with one-half its volume of alcohol. Then clarify the juice by straining through flannel cloth and paper if necessary, and add to each 450 cc of the clarified juice 850 Gm of sucrose. Dissolve the sucrose in the juice by heat on a water bath, cool and remove the scum.

Preserve the product in well stoppered bottles in a dark place.

SYRUPUS CERASI

Syrup of Cherry

Syr Ceras

Pit fully ripe, dark, sour cherries. Rub the cherries through a wide mesh sieve and crush kernels in a grinder. Dissolve in the mixture 0.1 per cent of benzoic acid and allow to stand for

three days at room temperature. The filtered juice should produce a clear solution with one-half its volume of alcohol. Should a turbidity form, allow the mixture to stand until a portion of the filtered juice remains clear with one half its volume of alcohol. Press the juice through a flannel cloth and filter through paper, add to each 450 cc of the filtered juice 850 Gm of sucrose. Dissolve the sucrose in the juice by heat on a water-bath, cool and remove the scum.

Preserve the product in well stoppered bottles in a dark place.

The question of policy of recognizing both raspberry and strawberry syrups might possibly be raised because of the close relation of these flavors to each other. That, however, they have rather specific disguising qualities may become, it seems to us, evident from the following two prescriptions.

In the administration of small quantities of antipyrine as in children's dosage, raspberry syrup seems to give a better disguise than most anything else we have tried. The following prescription might bear this out.

R	Antipyrine	2 0
	Water	2 0
	Syrup of Raspberry, to make	60 0 cc
M and label	Teaspoonful in water every 2 hours (For child three years old)	
R	Sodium Citrate	15 0 Gr
	Water	7 5 cc
	Syrup of Strawberry, to make	60 0 cc
M and label	Teaspoonful in water every 2 hours	

In our opinion the same prescription with syrup of raspberry in the latter and the syrup of strawberry in the former is not quite as pleasant. Incidentally it might be mentioned that the citrates make raspberry syrup purplish, also that sodium citrate is less offensive to the palate than potassium citrate.

Syrup of cherry is an almost specific vehicle for the pleasant administration of acid as shown by the following prescription.

R	Diluted Hydrochloric Acid	5 0 cc
	Syrup of Cherry, to make	60 0 cc
M and label	Teaspoonful in $\frac{1}{2}$ wineglassful of water after meals	

The only competitor of cherry syrup is raspberry syrup which also results in a delicious combination, as is shown by the following formula.

R	Diluted Hydrochloric Acid	5 0 cc
	Syrup of Raspberry, to make	60 0 cc
M and label	Teaspoonful in $\frac{1}{2}$ wineglassful of water after meals	

The following two prescriptions might show a reason why syrup of wild cherry should be deleted in favor of syrup of cherry.

R	Codeine Phosphate	0 25 Gm
	Ammonium Chloride	5 00 Gm
	Water	5 00 cc
	Syrup of Wild Cherry, to make	60 00 cc

and the following

R	Codeine Phosphate	0 25 Gm
	Ammonium Chloride	5 00 Gm
	Water	5 00 cc
	Syrup of Cherry to make	60 00 cc

It will be seen that not only does the cherry syrup yield a more pleasantly tasting dose, but it is clear, while the syrup of wild cherry is turbid from precipitation of codeine tannate

Another comparison of interest is yielded by the following two prescriptions

R̄	Iron and Ammonium Citrate	5 0 Gm
	Syrup of Wild Cherry, to make	60 0 cc
and		
R̄	Iron and Ammonium Citrate	5 0 Gm
	Syrup of Cherry, to make	60 0 cc

The former is ink, the latter is merely dark, and not unpalatable, though we believe the Syrup of Cinnamon (new formula) furnishes the better vehicle

CONCLUSIONS

1 We advocate a change in the preparation of the syrup of raspberry consisting in the introduction of 0.1 per cent of benzoic acid in the fruit juice undergoing depectinization

2 We respectfully submit formulas for syrup of strawberry and syrup of cherry to consideration for admission by either the United States Pharmacopœia or the National Formulary

3 In the preparation of these other fruit syrups we also find that the presence of 0.1 per cent benzoic acid is of value in the removal of pectin while preventing vinegar formation and other fermentations

4 The syrup of cherry becomes much more highly flavored when it is made from the cherry juice that has been permitted to stand in contact with crushed cherry stones for several days, than if made without the maceration of the kernels

5 Syrup of raspberry seems to form a particularly useful vehicle for antipyrine in small dosage, syrup of strawberry for sodium citrate and syrup of cherry for diluted hydrochloric acid

HOSPITAL PHARMACY PRACTICE AN INNOVATION *

BY J. SOLON MORDELL ¹

In the latter part of 1925 a group of forty-five physicians and one pharmacist, members of the staff of the University Hospital and of the affiliated teaching hospitals of the College of Medicine, Syracuse University, embarked upon a program of rationalization of hospital drug therapy. This committee, representative of every branch of medical practice, and under the chairmanship of the Director of the Department of Pharmacology at the College of Medicine, was asked to investigate and to offer some organized plan to correct the existent drug situation.

Time, effort and finances were, and still are deservedly expended in improving diagnostic methods. Yet little interest has been shown in having drug treatment keep abreast of diagnostic progress. It was just such a problem which confronted this group in 1925. The condition was by no means a local one nor was it any

* Section on Practical Pharmacy and Dispensing A. Ph. A., Washington D. C., meeting 1934

¹ Pharmacist, Syracuse University Hospital of the Good Shepherd, Syracuse, New York

more serious than in other institutions. In many respects the movement was pioneer in nature and had little assistance in the way of precedent.

The efforts of this committee were consummated by the publication of the *Interns Handbook*¹. This book, which includes a description of emergency medical and surgical procedures, presents as one of its important achievements a drug list which exhibits drugs of proved therapeutic value and those which are felt to be the most efficient of their respective groups. The list is unencumbered by drugs which duplicate one another's action. Selections were made from the *United States Pharmacopæia*, the *National Formulary*, *New and Nonofficial Remedies* and *Useful Drugs*. Each item gained its place after it had been considered meticulously from every standpoint. Whim and custom were brushed aside and replaced by a scientific, common-sense attitude. The list is outstanding because of the scarcity of so-called "specialties." Preparations of official drugs under fanciful names are absent, as are items whose formulas are secret. Digitalis, ergot, cresol solution, liquid petrolatum and a host of others are deemed efficient *per se*. No sympathy is extended to embellishments of these items and the exorbitant price premiums entailed. In the rare instances where specialties were approved for admission, it was for the reason that they possess unique value not available in other preparations. In no case were specialties considered unless accepted by the Council on Pharmacy and Chemistry of the American Medical Association, thus, among other considerations, implies that formulas and standards are not secret. Similarly, wherever several manufacturers are bidding for the same item, preference is given to the product approved by the aforementioned Council.

The drugs are not grouped and classified according to therapeutic use, but listed alphabetically, by Latin title. The object was to induce a feeling of independence on the part of the prescriber in so far as application of the various drugs is concerned. It was felt that to suggest therapeutic uses would put prescribing on a cataloging basis and would discourage individual initiative in this respect.

The list of approved drugs included as a part of the material presented in the *Interns Handbook*, once officially adopted, laid the foundation for a reorganization of the entire system pertaining to the issuing of medicaments. It was not until 1929—four years after the establishment of the committee—that the *Handbook* was published and sold throughout the world. This wide distribution was possible because the material presented was not individualized to the group here but was made applicable for most hospitals. At this writing, the book is in process of revision.

During the four years of work on the original project, and for three years thereafter, the ground was being carefully prepared for reconstruction in the Pharmacy and throughout the hospital. After having secured the coöperation and sympathy of the heads of the various services, the work had to be done cautiously. A radical transplanting would have been disastrous to the whole plan. Each step had to be studied most carefully before it was put into operation. It should be noted that the guiding hand in all this work was that of a specialist in pharmacology, whose knowledge of drug markets as well as drugs is such as to make him constantly aware of the fads in medicine and to prompt him to assume a very critical attitude in all matters pertaining to the uses of drugs. Cooperation between a

¹ J. B. Lippincott Company, Philadelphia, Pa.

physician of this type, experienced in therapeutic problems, and a pharmacist possessing the necessary training and professional ideals, is prerequisite to the success of an undertaking of this nature

Finally, in the summer of 1932 the situation was ripe enough to permit a general housecleaning in the Pharmacy and in the drug cabinets throughout the hospital. This work involved not only the discarding of all undesirable drugs and drug preparations, but a careful revision of buying methods. By October 1932, the eight hundred drugs previously inventoried in the Pharmacy were reduced in number by over five hundred, leaving an inventory of approved items of less than three hundred. Comparing this with the inventory of one hospital which, in reply to a questionnaire by the chairman of the committee, reported seven hundred, while other large modern hospitals reported as high as seven thousand, and eight thousand,¹ one gets a picture of the inroads which the drug situation, if uncontrolled, may make in the hospital budget. There is an analogous condition in retail pharmacies. We can find sections of shelf space in most retail establishments, which have four or five, or even more items identical in composition. The pharmacist, unfortunately, does not entirely control the situation. He must maintain a stock which will prepare him to meet all demands.

The picture in the hospital here is different. Under proper guidance, useless waste is eliminated. The following is a list of regulations formulated to cover pharmacy service in this institution.

(1) The Pharmacy is placed under the supervision and direction of the Department of Pharmacology, in so far as the supply and standardization of drugs for use on ward cases is concerned.

"(2) This implies that the Director together with the Pharmacy Committee and the Pharmacist, possesses or is able to secure special information concerning drugs not easily accessible to others of the hospital organization, and will undertake to supply such information as occasion arises. Decisions of the Director, in conjunction with the Pharmacy Committee and the Director of the Service involved, on such matters as quality and integrity of drugs are to be on the same basis as those of the Heads of other clinical laboratories and are to be overridden only in emergency.

"(3) Additions and deletions of drug stock and changes in forms of drugs, shall be effected only after conferring with the Directors of the Services involved who may also recommend changes including the addition of new remedies. Advice and counsel may be obtained by them from the Department of Pharmacology whenever questions of the relative merits of these new remedies shall arise. However, when these newer preparations are used as a part of a controlled clinical investigation the Directors of Medicine and Surgery shall be responsible for such investigation and shall determine whether they shall be used the Director of the Pharmacy merely acting in an advisory capacity."

The above regulations are directly applicable in hospitals affiliated with a college of medicine, but the details may be adjusted to suit conditions in hospitals which do not have this connection.

Only those drugs which appear on the approved list may be prescribed for ward patients. The hospital ruling with regard to private patients is that drugs not regularly stocked are purchased especially, in the least possible quantity. The patient is charged with this quantity, even though it may materially exceed the

¹ "The Doctor and the Hospital Pharmacy" M. S. Dooley, M.D., director of Pharmacy and chairman of Pharmacy Committee, University Hospital and *Interns Handbook* Committee, *Bull. Am. Hosp. Assoc.*, January 1931.

amount actually needed. In many such cases visiting physicians have inquired as to the corresponding item regularly stocked and approved, and have ordered it. This has usually served to reduce the patient's bill considerably with no sacrifice of therapeutic efficiency.

Advice and information are available at the Pharmacy. Here, by virtue of contact with so many physicians, the hospital pharmacist has a splendid opportunity to demonstrate to them the proper uses of vehicles and flavors, to help them construct an efficient and palatable prescription. Of course, all questions out of the pharmacist's scope are submitted to the pharmacologist.

The following procedure is used in issuing drugs. Each division (fourteen in number) sends a partitioned wire basket to the Pharmacy in the morning. Empty stock containers are included in these baskets for refilling according to an order book which, after having been checked by the nurse in charge of the division, is counterchecked and signed by a supervisor of nursing. Special orders originating during the night, for prescriptions or items not regularly stocked, are also listed in this order book. Orders presented during the day are made out on separate requisition blanks, also signed by the nurse in charge and countersigned by a supervisor of nursing. These orders have, in addition to the desired item or items, a notation of the dosage to be given, which dosage is checked by the pharmacist. In instances where patients are leaving the hospital, a notation to that effect is made. The pharmacist, in such cases, places only the directions on the label, instead of the ingredients, as is ordinarily done with containers issued in the hospital.

As part of the reorganization activities, a radical change was made in the equipment for handling the various medicaments. Uniform screw-capped, green-glass vials are used for tablets, capsules and pills, instead of pasteboard boxes. Liquids are supplied in bottles of the ebony screw-cap type. All vials and bottles bear typewritten labels coated with a suitable label varnish. These containers are used for items which constitute the regular stock supply on each division. Since special orders are used only during the stay of the patient using them, they are issued in pill boxes or in corked bottles.

The official English title of the Pharmacopœia or National Formulary is used on all labels. If in neither text, an approved title is designated by the Pharmacy committee. This eliminates misunderstandings which arise when all sorts of common names and synonyms are used. The English, rather than the Latin title, is used for the reason that the nurses receive no special instruction in the Latin of pharmacy. Prominence is given throughout to the metric system.

Another step in the reorganization consisted in equipping all divisions uniformly. Since the hospital includes a school of nursing which rotates student nurses throughout the various hospital divisions, it contributes greatly to efficiency if the nurse does not have to be confronted with a different drug arrangement with each change she makes. The same applies to private duty nurses, since a change of patient may mean a change in location in the hospital. In addition to uniform arrangement and lay-out, a stock list is posted on each division. This list is valuable in several ways. *First*, it is a guide whereby each division may intelligently replenish its stock of drug supplies, *second*, it guides the new student nurse who is acquainting herself with the equipment of the particular ward concerned, *third*,

it controls any overloading of drug supplies throughout the hospital, and *fourth*—a matter of extreme importance—it serves as a control for the pharmacist, obviating waste in supplying the hospital, and enabling him to prepare his own stock intelligently

The most recent improvement effected has been the establishment of a central supply room in conjunction with the Pharmacy. This coordination does not usually exist in other hospitals. Under the new arrangement, the preparation and sterilization of solutions for parenteral use (such as Physiological Sodium Chloride and Ringer's), as well as the sterile dressings and various sterile trays (hypodermoclysis, intravenous, thoracentesis, paracentesis, etc.), are all carried out in this specially equipped room. Previously these operations had been performed in another division of the hospital, which division combines several different activities. The principal advantages sought by the change were, *first*, that of having the solutions prepared and sterilized under the supervision of the pharmacist, and *second*, that the unit would be specialized for the above-mentioned functions instead of being part of a conglomerate department. To effect this change, it was necessary to break through one wall of the Pharmacy into a room formerly used for excess stock of another department. As a result, the pharmacist is able to have constant surveillance of operations. The actual work is handled by a capable graduate nurse who has had special instruction and experience in this branch, while the pharmacist checks all operations and acts in a consulting capacity.

No little advantage has accrued to the hospital's financial situation as a result of the work done in the pharmaceutical end. Without sacrificing quality and efficiency, the replacement of costly specialties by their corresponding official drugs wherever possible, and the elimination of questionable patent medicines and nostrums has meant savings which, during the first year of operation of the new set-up, ran into four figures. It is quite certain that the second year's operations will reveal a considerably greater saving. It is important to note that the original primary aim was solely to rationalize drug therapy. The marked financial advantages which attend such a plan are, therefore, significant and satisfying.

Through the efforts of the AMERICAN PHARMACEUTICAL ASSOCIATION, the Council on Medical Education and Hospitals of the American Medical Association has initiated a move in the right direction with regard to hospital pharmacies.

As described in the April 1934, JOURNAL A. PH. A., this Council has included in its "Essentials of a Registered Hospital" the one requiring that "the handling of drugs should be adequately supervised and should comply with state laws." The next step might well be that of establishing minimum standards in hospital pharmacies with regard to the nature of drugs handled. Much has been accomplished by the various medical groups concerned, with regard to standards for the operating room, the X-ray division, Physiotherapy, etc. In coordination with the AMERICAN PHARMACEUTICAL ASSOCIATION, the American Medical Association can do much to raise hospital pharmacies to the standards it has so admirably reached in the other departments of the hospital.

HISTORY IN THE DRUG STORE *

BY FRED B. KILMER ¹

Only in a limited way has history yet entered the drug store, and reached the man behind the counter. Eminent authorities from this ASSOCIATION have made highly important contributions to the history of pharmacy. For the most part, the pages upon which their records appear lie unopened and unread. The drug store man is not history-conscious.

Possibly, we have too much history. The progress of the world, the advance of science, of pharmacy and of the art of printing have evolved such a vast collection of historical material that the ordinary man finds life too short to even glance at them.

At times the druggist adopts Henry Ford's dictum that "history is bunk." He lets the past bury the past. With him events begin with the day he was graduated from college, got married or bought his first store. With many astute men nothing back of the World War, the depression or the NRA counts. This is a very human point of view for the man of to-day.

Few pharmacists have come to realize the uses and value of history. History is filled with lessons wherein we may learn to profit by the example and teaching of those who have gone before us in a world and a society not unlike the one in which we live. A knowledge and understanding of the realities of the history of pharmacy, and of the sale and dispensing of drugs, would help us to avoid many of the perplexities and catastrophes which now afflict us. The real lessons of history can be turned into dollars.

Rarely does the pharmacist reach to the delights of history. History helps us to know what our ancestors did—their troubles, their faults and their successes. It presents a story, a moving picture of life. History presents a marvelous play, with interludes, by-plays, changes of tone, changes of scene. One can find in history things that are romantic, picturesque, artistic and beautiful.

WRITTEN HISTORY

There exists an abundance of written history. The shelves of our libraries are loaded with historical volumes. The pages of our magazines are crowded with historical essays.

Even with this array, the fact seems to be that history is not yet a popular subject. Historical volumes cannot be counted among the "best sellers." Pharmaceutical history has not yet penetrated behind the drug store counter.

In part, this condition may be due to the mode and manner of its presentation. Right here the historically minded reader may well say to the writer "Who are you to tell us how we should write history?" Well, the author of this essay, with all humbleness, acknowledges that he is only a smatterer in history. He is not a historian. As a most humble student he, with due deference to the many eminent historians, offers the suggestions of a rather awkward beginner.

Much of our written history of pharmacy has been put together by able professional historians. Much of it has been written by the historical scholar. Facts,

* Section on Historical Pharmacy, Washington meeting, 1934

¹ Deceased

dates, footnotes, references and proofs abound in the pages. Often the author seeks to fortify himself against the criticisms of other historians. Readability and attractiveness are sacrificed.

Facts and dates, while highly important, taken alone do not make history. When the historian of the pick and shovel, the paleontologist, finds a skull or the bones of a jaw of a man who lived centuries ago, he must make the dry bones live. From the rocks under which his "find" was buried he determines the era in which his man lived. Hypothetically, he supplies the missing parts with plaster and putty. He lays on tints, and lo! we have a man who lived two thousand score years ago.

To record the history of pharmacy in any age we must take note of political and social events, the advancement of science, changes of policy, changes in taste, dress, ways of living, comforts, books, plays, popular songs and many things which make up and control human life and activities. In the midst of these, pharmacy and the drug store have lived and moved. History cannot be divorced from life.

To fulfil its mission, written history must be read. The reader must "read, mark and inwardly digest," and finally apply its lessons to his life and work. We may well believe that the history of pharmacy can be presented in such a way that it will reach into the drug store, and that the man behind the counter will live and move in its elevating air. The craftsmanship may well be left to our most capable producers of pharmaceutical history.

The AMERICAN PHARMACEUTICAL ASSOCIATION, through its museum and repository, will become a notable center for pharmaceutical history. Unfortunately, our pharmaceutical and trade associations have done but little along historical lines. A survey revealed that certain associations did not have on file complete copies of their own proceedings. Very meager were instances where there was an attempt to preserve historical data as to their organization. Associated effort in pharmacy contains an important record of the progress of the art. It is well worthy of preservation and use.

Pharmaceutical manufacturers, in a limited way, have found it wise to give attention to the history of their calling and their own organization. Some of them have installed a historical department or museum wherein are collected records, specimens of early productions, advertising and other data. Collections of this character have proved to be of service in the education of salesmen, detail men and others, as to the historical background of the institution. Notable have been the collections pertaining to general historical pharmacy acquired by certain manufacturers.

The retail druggist can, through history, draw patronage, gain reputation and increase his prestige. The use of historical elements will give a new and a different twist to drug store publicity. Above all other practitioners of the art of pharmacy, the retail druggist can turn history into cash. An economical method is through historical displays.

Drug store historical exhibits may consist of window displays, which may be moved to the interior of the store, and within the store moved from one point to another, forming a continuous show. A well-planned historical exhibit will hold attention from two weeks to a month. From one to twenty historical exhibits can

be given annually Through changes, historical exhibits can be repeated from year to year

The druggist may properly use his exhibits as an advertising medium Physicians, nurses, professional men, prominent citizens and college and high school classes are worthy of special invitations The local papers will be glad to give special write-ups of the show

Subjects with which to form an historical display in the drug store are abundant The history of the art of pharmacy may be shown by pictures clipped from magazines and books, through old-time implements and apparatus, side by side with modern types The map issued by the National Wholesale Druggists' Association, showing pictures of colleges of pharmacy, may form a background, giving the present-day status of pharmaceutical education College diplomas, certificates of registration and association memberships of the store owner and clerks will show that the personnel of the store stands high professionally One druggist excited curiosity by having his clerks, during his exhibits, wear the time-honored green baize apron

The drug store historical exhibit may well begin with a history of the druggist's own store, and his own town Dependent upon the age of the store and the town, abundant material may be found Pictures of the town as it was and as it is Methods of transportation from the day of the ox-cart on to the auto and the aeroplane Old churches, old schools, hospitals, streets and dwelling houses contrasted with the new, including the druggist's own store as it was and as it is To these may be added pictures of old-time citizens, old doctors and their prescriptions, and notable events of the past

Included in a series of exhibits pictures pertaining to the history of medicine might be utilized Here an abundance of material is available

The subjects for an historical display are extensive A few examples may be noted Old-time animal remedies in contrast to modern animal serums Ancient bolus and uncoated pills as against modern pills, capsules and tablets Crude drugs of the past by the side of present-day alkaloids, concentrations and synthetic compounds Charms formerly used as cures in conjunction with to-day's rational remedies

A most creditable display was shown in the *Druggists Circular*, for March 1934, which by means of cards and objects exhibited four thousand years of pharmacy and medicine, beginning with the time of the Egyptians, and concluding with the twentieth century

Another recent exhibit was along the lines of the history of surgery The art of surgery has been completely revolutionized within fifty years While the use of ether is of the nineteenth century, local anesthetics have come into vogue

A show in the history of surgery, which made everybody stop, consisted of the showing of a frock coat, used up to the late nineties as a surgeon's operating uniform, side by side with the outfit of the modern operator's cap, face mask, white gown and rubber gloves

For history to reach into the drug store, it would seem that the beginning should be made in the college of pharmacy A knowledge of the history of the arts to which he is to devote his life should be an inspiration and incentive to the stu-

dent to move forward. Once imbued with this knowledge, he would no doubt carry it to those with whom he may be associated.

In the preparation of this paper, correspondence was had with the deans of some of our colleges of pharmacy as to the place of the history of pharmacy in their colleges. Briefly stated, the situation would be somewhat as follows:

A moderate percentage of the colleges of pharmacy possesses a historical museum, likewise, a collection of data, documents, etc., pertaining to their own institution. A number of the colleges have in their libraries volumes relating to the history of medicine, pharmacy and allied arts. Courses covering the history of pharmacy are given in a goodly number of the colleges. In some of them it is short, covering only two hours in the three or four years' course. However, in some colleges the course is quite extended and complete. Encouragingly, there is reported a moderate interest by students in history as it pertains to pharmacy.

Many of the deans kindly made suggestions as to methods whereby the interest of students and graduates in pharmaceutical history could be increased. These suggestions will be made the subject of a separate paper.

This paper is primarily suggestive. An attempt is made to show that history, especially the history of pharmacy, has not yet reached into the drug store.

That for the great majority of druggists and their clerks, the subject of history has little or no interest,

That while able historical writers have produced much valuable historical data, it has not yet created an historical atmosphere for the rank and file of pharmacists,

That here is an opportunity for our associations to further stimulate interest in historical subjects,

That the practicing pharmacist—the druggist—can, through historical displays, promote an interest in the history of medicine and pharmacy to his own advantage.

HISTORY OF THE CALCIUM LACTOPHOSPHATE PREPARATIONS¹

BY WILLIAM J. HUSA² AND A. P. MCLEAN

Calcium lactophosphate came into use as the result of the suggestion of an European physician, Dr. L. Dusart, who, in 1869, recommended the use of calcium phosphate dissolved in lactic acid (1). In 1871, William Neergaard (2), a pharmacist of New York City, upon the request of Dr. B. W. McCready, prepared a syrup of calcium lactophosphate by dissolving freshly precipitated calcium phosphate in a diluted lactic acid, and adding water, orange flower water and sugar. This is the oldest record we have found of the use of calcium lactophosphate in this country. It was the spark which was followed by a blaze of tremendous popularity.

Because of the demands of physicians for numerous combinations of calcium lactophosphate, preparations other than the syrup came into use. Some of these, such as the elixir, the syrup with iron, and the salt, received official recognition, and there were a number of others, not so recognized, including the solution, the wine, and the emulsion with cod liver oil.

¹ Section on Historical Pharmacy. A. P. H. A., Washington meeting, 1934.

² Head Professor of Pharmacy, University of Florida.

After the article published by Neergaard in 1871, giving a formula for a syrup, a number of somewhat similar reports appeared in other journals. These were written in the main by pharmacists, who suggested their own preferred formulas, or some slight modifications of formulas, which to them seemed to give better or more stable preparations. In the syrup as well as the other preparations the principal difficulty encountered was the formation of a precipitate. Little attention was paid to the cause or nature of the precipitate, but efforts were made to delay or decrease the precipitation by changing the ingredients or varying the amounts. By 1880 the syrup of calcium lactophosphate had come into such wide use that it was recognized in the U S P VI, and was also official in the U S P VII, VIII and IX but was dropped by the U S P X and taken up by the N F V.

The first record found of Emulsion of Calcium Lactophosphate was its recognition by the N F I. It was also official in the N F II, III, IV and V. Syrup of Calcium Lactophosphate and Iron has been similarly recognized by each edition of the N F.

For some years there was a difference of opinion regarding the chemical nature of calcium lactophosphate. Rother (3) considered it to be a double salt while Sambuc (4) stated that the salt was merely a mixture of calcium lactate and calcium phosphate. When calcium lactophosphate in the form of the salt was recognized by the N F IV, it was defined as "A mixture in variable proportions of calcium lactate, calcium acid lactate and calcium acid phosphate."

Among the unofficial preparations of calcium lactophosphate, the wine seems to have enjoyed little popularity in comparison with the others, perhaps because the alcohol of the wine made the preparation undesirable for children and it was for children that the preparations were mostly used. The solution of the salt likewise did not find extensive use.

The emulsion of cod liver oil with calcium lactophosphate enjoyed very wide popularity as an unofficial preparation. The earliest formula found was that of W G Moffit (5) published in 1873. Other formulas were proposed and commercial emulsions were put on the market by some of the manufacturers. The emulsion was criticized on pharmaceutical grounds by Polk (6), who also made the following statement:

"The cry of 'Eureka' which has ascended so loudly over the new hobby, lactophosphate of lime and cod liver oil, it seems has almost led the enthusiastic members of the medical profession to hope that the great specific for all the ills to which flesh is heir had at last been found. The long high-sounding name leads us to regard it with respect and confidence. The errors of the combination outside of the quackery into which it has been run, however, immediately concerns us."

The emulsion was popular for about five years and after that no further record could be found in the literature.

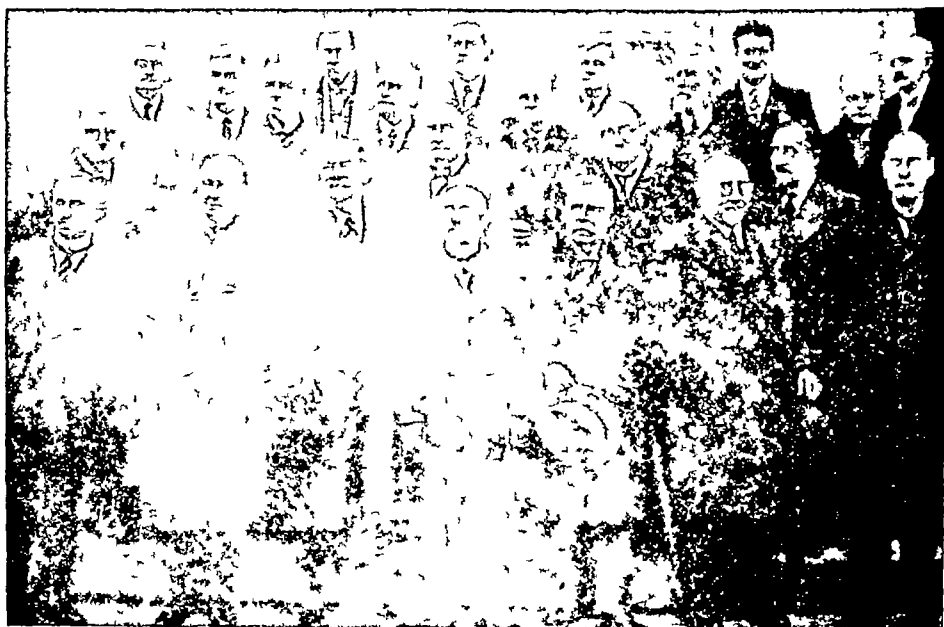
Polk's denunciation of emulsion of cod liver oil with calcium lactophosphate appears unjustified in view of later developments. It is now accepted by medical authorities that rickets may be due to a dietary deficiency in any one of three things, *i e*, calcium, phosphorus or vitamin D. The emulsion of cod liver oil with calcium lactophosphate contained all three of these substances needed for proper development of bones, hence it seems unfortunate that the preparation did not remain popular. At the time the emulsion was introduced, vitamins were yet to

remain undreamed of for four decades. The emulsion thus suffered the fate of other innovations which are too far ahead of their time. In passing it is of interest to note that at about the same time that the emulsion fell into disuse, a physician made extensive reports on the value of sunshine in rickets and other diseases but he likewise was too far ahead of this era of irradiated food, irradiated drugs and irradiated human beings.

REFERENCES

- (1) Dusart Dr L. *Archives Generales de Medecine* December 1869, January and February 1870, cited by reference (2)
- (2) Neergaard William, *Am J Pharmacy*, 43 (1871), 243-244
- (3) Rother R. *Ibid* 55 (1883) 607-610
- (4) Sambuc M. *Arch pharm* (June 1887), through *Proc A Ph A*, 35 (1887), 286
- (5) Moffit William G. *Am J Pharm* 45 (1873), 154-157
- (6) Polk C G. *Ibid* 46 (1874) 102

SCHOOL OF PHARMACY
UNIVERSITY OF FLORIDA
GAINESVILLE FLORIDA



Pharmacists at the 50th Anniversary Celebration of the Institute of Pharmacy, University of Liege

Front row (left to right)—Professors Goubau (Ghent) Herrissey (Paris) Van der Wielen (Amsterdam), Schoofs (Liege), Van Itallie (Leiden) Perrot (Paris), de Graaf (Utrecht). Back, from left—Prof Sternon (Liege), Prof Vivario (Liege), Mr H N Linstead (Britain), Prof Van Os (Groningen), Prof Stamer, Dr Hofman (The Hague), Col Thomann (Switzerland), Prof Faurholt (Brussels), Prof Ohlsson, Prof Wattiez (Brussels), Prof Goris, Prof Van de Velde, Prof Castille (Louvain), Prof Penau, Dr Jermstad (Oslo), Prof Van de Vorst.—*Pharmaceutical Journal* Dec 22, 1934. Please see *JOURNAL A Ph A* December 1934 page 1243—note type error "Normal Arsenic"

THE DEPARTMENT OF THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY

C B JORDAN—CHAIRMAN OF EXECUTIVE COMMITTEE, A A C P, EDITOR OF THIS
DEPARTMENT

"The attitude of the American Association of Colleges of Pharmacy on the question of food and drug legislation was well expressed last year when Dean DuMez and the Chairman of the Executive Committee appeared before the Senate Committee considering Senate Bill 2800 and again when the Association met in annual convention and passed a resolution indicating that the Association favored proper food, drug and cosmetic legislation. Our Association has a strategic position because its membership is not financially interested in food, drugs and cosmetics, nor actually involved in the administration of laws governing the distribution of food, drugs and cosmetics and therefore we can take a totally disinterested view of these matters. As citizens we must be vitally interested in the protection of public health and that is especially true in the case of teachers of pharmacy, since we are training young men and young women to go into one of the public health professions. The following statement by President Little of the Association has the approval of the Executive Committee and it sets forth the position we believe the Association should assume."

—C B JORDAN, *Editor*

FOOD AND DRUG LEGISLATION

One of the most important questions claiming the attention of pharmaceutical educators this winter is the problem of a sane, adequate revision of the Pure Food and Drug Act.

The activity of the American Association of Colleges of Pharmacy in helping to promote such a revision needs no justification. We would oppose the idea that the function of colleges of pharmacy is to concern themselves solely with problems of education. That, to be sure, is their major activity, but by no means their sole responsibility. Pharmacy can hope to achieve its maximum accomplishment, only by having all of its various branches stand ready and eager to put their shoulders to the wheel and to play their full part in every possible contact.

It is in this spirit and with this hope that the American Association of Colleges of Pharmacy approaches the problem of food and drug legislation.

One of the most pathetic persons with whom we come in contact is the individual who fails to have definite, concrete opinions concerning important problems which are presented to him in his own or closely related fields. We might place second on this list of pathos, the individual who displays inadequate appreciation and respect for the other fellow's opinion. There is no reason whatsoever why tolerance and definiteness of opinion should not go hand in hand.

Pharmacy has become an exceedingly broad field, with many different interests and activities represented. It is but natural that many of these interests should possess somewhat different ideas as to what constitutes a sane, effective revision of the Pure Food and Drug Act. It is also equally certain that all these various branches of pharmacy have much in common. It is on this common ground that we should marshal and unify our forces and through concerted, efficient action accomplish much in the field of food and drug legislation.

Is not the best procedure to first search out all the various viewpoints and objectives which the different branches of pharmacy have in common? Let none escape us. The greater this pool of common interests, the stronger will be our cohesion and solidarity and hence the greater our accomplishment.

Should the time come, and we sincerely hope that it may not, when certain groups must draw apart to prepare separate bills, let us part with the finest appreciation of the other fellow's viewpoint. Let us part in a spirit of friendship and cordiality, with each group definitely pledged to carry into the product of its individual efforts the very maximum of that which has been commonly agreed upon.

From this point on, those purposes and recommendations which are most meritorious and most completely in accord with public health and welfare should prevail.

If we keep this fundamental objective of public health ever before us as our goal, no really profound differences are likely to develop and a sane, progressive and generally desirable revision of the existing law should not be difficult of attainment.

At the annual meeting of the American Association of Colleges of Pharmacy held at Washington last May, the Association went unanimously on record as favoring Senate Bill No 2800 or a measure of greater merit. That, I believe, represents the attitude of the Association at the present time.

As president of the American Association of Colleges of Pharmacy, I have appointed a special committee, consisting of Dean Andrew G DuMez, Dean Wortley F Rudd and Dean Charles B Jordan, Chairman, to represent the Association as our Committee on Food and Drug Legislation. I have also appointed an auxiliary committee consisting of one or more representatives in each state, to cooperate with the smaller committee as opportunity to do so presents itself. This larger committee will later receive specific directions and suggestions as to ways and means of assisting with our legislative program. In the meantime, we are organized and ready for action.

At a meeting of the National Drug Trade Conference held at Washington, D C, on Wednesday, December 5th, Dean DuMez again set forth the position taken by the American Association of Colleges of Pharmacy with respect to proposed food and drug legislation by a statement of the more important provisions which the Association maintains should be incorporated in any new legislation. These provisions are as follows:

- 1 A new definition of the word "drug" to bring within the purview of the law certain substances (glandular products) and certain devices not always marketed as therapeutic agents in a strict interpretation of the meaning of that term, but which when used as directed, may produce marked alterations in the tissues of the body or the functioning of its organs, as for example devices for increasing stature, devices for developing the bust, devices for stimulating the activity of the prostate gland, nose straighteners, electric belts, etc.

- 2 Provisions for bringing cosmetics within the scope of the law.

- 3 Provisions which will make it obligatory for a manufacturer or distributor who puts up drugs or medicines in packages for sale to the public to state on the label the name, or names of the substance, or substances, upon which the therapeutic or palliative claims for said drugs or medicines are made, and the quantity, or quantities contained in a single dose.

- 4 Provisions for the control of the manufacture, sale and distribution of poisonous habit-forming or deleterious drugs, or medicines containing any of said classes of drugs, to whatever extent is necessary to give the public adequate protection against the harm which may result from the indiscriminate sale of drugs and medicines of this character.

- 5 Provisions for prohibiting the advertisement on the label, package, and/or by any other means of any drug or medicine as a treatment or cure for any of the following diseases: albuminuria, appendicitis, arteriosclerosis, septicemia, cancer, carbuncle, cataract, cholecystitis, diabetes, diphtheria, dropsy, encephalitis, epilepsy, erysipelas, gall stones, heart diseases, high blood pressure, mastoiditis, measles, meningitis, mumps, nephritis, otitis media, paralysis, pneu

monia, poliomyelitis, prostate gland disorders, pyelitis, scarlet fever, sexual impotence, small pox, tuberculosis, tumors, typhoid fever, uremia and venereal diseases

6 Provisions for restricting the advertisement of any drug or medicine, regardless of the medium used for exhibiting or disseminating such advertisement, to the truthful statement of facts with respect to any or all claims made for the palliative or curative properties and/or its value in the treatment of disease

This stand represents the opinion of the Executive Committee of the A A C P and a very high percentage of the individual members of the Association as well

I sincerely hope that our members will actively concern themselves with food and drug legislation during the coming session of Congress and that all controversial questions which may arise will always be settled on a basis of public health and welfare

As long as we keep public health as our platform, the very foundation of all our activities, we cannot seriously err If we relinquish this guiding motive, we may wander far astray —ERNEST LITTLE, *President*, American Association of Colleges of Pharmacy

GENERAL REGULATIONS, SERIES 4, FEDERAL ALCOHOL CONTROL ADMINISTRATION

A proposed regulation, under consideration by the Federal Alcohol Control Administration, would have placed pharmacists in the class of *dealers in beverage alcohol*, it would have increased the cost of their supply of ethyl alcohol and required them to take out Federal and, perhaps, local licenses, thus adding further costs to the pharmacists' burdens, without giving additional protection to the government service The points are, the proposed ruling, if it had been adopted, would have increased the cost of alcohol to the pharmacist, because he would have had to buy in gallon bottles paying a higher price and also be subject to the licenses referred to, and be placed in the class of *dealers in beverage alcohol*

THE AMERICAN PHARMACEUTICAL ASSOCIATION asked the privilege of being heard and expressed that practicing pharmacists should be enabled to freely secure alcohol for medicinal preparations at lowest cost, not only in their own interest but also in the interest of those in need of medicine This appeal was influential in promoting the regulation to which reference is made and issued January 22 by the Federal Control Administration Because these regulations are informative relative to general definitions and terms, every pharmacist should secure

copies from the station of the Department nearest to them Two paragraphs are quoted

"In issuing these Regulations the Administration has provided that alcohol and other distilled spirits in containers of a capacity of one gallon or less shall be deemed to be for non-industrial use The effect of this provision will be to require all wholesale druggists, industrial alcohol plants and others, who do not hold Federal Alcohol Control Administration permits, to supply the needs of drug stores hospitals, pharmaceutical manufacturers and other industrial alcohol users in containers having a capacity of more than one gallon "

'Heretofore the Regulations of the Treasury Department which require that beverage distilled spirits for sale at retail be placed in glass liquor bottles, have not been applicable to alcohol The Treasury Department, however, acting in cooperation with the Administration and desiring that all spirits for beverage use be definitely distinguishable from spirits intended for industrial purposes, is amending its Bottle Regulations so as to require that on and after April 15, 1935, all distilled spirits, including alcohol, if marketed in containers of a capacity of one gallon or less, shall be placed in glass liquor bottles manufactured under Treasury permit and having blown therein the indicia required by Treasury regulations "

THE AMERICAN PHARMACEUTICAL ASSOCIATION always seeks to be of service to pharmacy and pharmacists

ASSOCIATION BUSINESS

AD INTERIM BUSINESS OF THE COUNCIL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, 1934-1935

Office of the Secretary 2215 Constitution Avenue, Washington, D C

LETTER NO 9

December 20, 1934

To the Members of the Council

48 *Minutes of the Meeting of the Executive Committee* Motion No 2 (Council Letter No 2, page 846) has been carried President Fischelis requests that he be recorded as voting 'No' on this motion

49 *Committee on the Proposed Council on Pharmaceutical Practice* Chairman Cook has submitted the following report for this Committee with the statement that the report has the endorsement of all members of the Committee who were present at the meeting on August 18th Chairman Cook expressed the belief that although the actual carrying out of the plan will be dependent upon some scheme of finance which it is hoped can be developed, it will be an advantage to have the plan presented in full and discussed so that it can be better understood

REPORT TO THE AMERICAN PHARMACEUTICAL COUNCIL ON THE SUGGESTION TO ESTABLISH "A NATIONAL COUNCIL ON PHARMACEUTICAL PRACTICE" AS AN ACTIVITY OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

The proposal was presented at the Second General Session of the AMERICAN PHARMACEUTICAL ASSOCIATION at its 1934 meeting (see the JOURNAL AMERICAN PHARMACEUTICAL ASSOCIATION, 1934, page 601) and was also brought before the Council and referred to a special Committee with a recommendation for action

Considerable correspondence ensued and a meeting of the Committee was called in Washington for August 18 1934 The following were present Messrs Army, Cook, Fischelis, Jordan, Kelly Spease and Swain Messrs Gaw and Gathercoal were unable to be present although Professor Gathercoal sent a communication outlining his views

The discussion was general and included many of the problems which enter into to day's pharmaceutical practice in this Country

It was believed especially important to avoid creating an impression that the AMERICAN PHARMACEUTICAL ASSOCIATION was discriminating between pharmacists, since its sole object was to uplift every branch of pharmacy

Every practicing pharmacist would be invited to participate and while not all would care to do so, the reasonable and proper specifications intended should permit any properly trained and equipped pharmacist to register

The following recommendations were approved for the consideration of the Council of the AMERICAN PHARMACEUTICAL ASSOCIATION

1 That there be recommended to the Council the establishment of a "Council on Pharmaceutical Practice" to be conducted under the auspices of the AMERICAN PHARMACEUTICAL ASSOCIATION

2 In the recommendation to the AMERICAN PHARMACEUTICAL ASSOCIATION Council it is to be indicated that the objects of this group are to promote improvement in pharmaceutical practice by the following activities

(a) The assembling of information and facts from all available sources concerning the efficient practice of Pharmacy in

(1) Retail Pharmacies

(2) Pharmacies in hospitals and institutions

(3) Pharmacies in Government Service

(b) The dissemination of this information to those responsible for the conduct of pharmaceutical service in these fields

(c) To offer every facility of the AMERICAN PHARMACEUTICAL ASSOCIATION in the promotion of such service

(d) To establish minimum standards for pharmaceutical practice in these three fields

It was further moved and the motion approved unanimously, that it be recommended to the AMERICAN PHARMACEUTICAL ASSOCIATION Council that "if the AMERICAN PHARMACEUTICAL ASSOCIATION Council approves of the establishment of a Council on Pharmaceutical Practice and its objectives, that it be further recommended that this Committee be continued for the purpose of developing the plan and presenting a more perfected program to be reported to the AMERICAN PHARMACEUTICAL Council at the Portland Meeting in 1935 "

The personnel of the proposed "Council on Pharmaceutical Practice" was also discussed and it was recommended that the Council should consist of the Chairman of the National Formulary Committee of Revision, the Chairman of the U S Pharmacopoeial Committee of Revision a representative of the American Association of Colleges of Pharmacy, a representative of the National Association of Boards of Pharmacy, a pharmacist in retail service, a hospital pharmacist and a Government pharmacist, the President of the AMERICAN PHARMACEUTICAL ASSOCIATION Ex-officio and the Secretary of the AMERICAN PHARMACEUTICAL ASSOCIATION Ex Officio—making a total of nine members

It was also recommended that one representative from each of the following organizations be invited to participate in the work of the Council in an advisory capacity but without a vote

The National Association of Retail Druggists
 The American Drug Manufacturer's Association
 The American Medical Association
 The American College of Surgeons
 The American College of Physicians
 The American Dental Association
 American Nurses Association
 The American Hospital Association
 The Food and Drug Administration
 The Surgeon General of the Public Health Service
 The Surgeon General of the Army
 (Medical Administrative Corps)
 The Surgeon General of the Navy
 (Hospital Corps)

All of which is respectfully submitted with the request that the proposals be promptly considered by the Council

E FULLERTON COOK, *Chairman*

In this connection, the following letter has been received from President Fischelis
To the Members of the Council

I am glad to join Professor Cook in advocating the adoption of the suggestion to establish "A National Council on Pharmaceutical Practice" as an activity of the AMERICAN PHARMACEUTICAL ASSOCIATION As I see the proposal it entails a survey of existing pharmaceutical practice and the formulation of minimum standards to which pharmacies desiring the approval of the Council must adhere

The AMERICAN PHARMACEUTICAL ASSOCIATION is already committed to a survey of pharmaceutical practice by resolutions adopted at recent conventions

It is my belief that the establishment of "A Council on Pharmaceutical Practice" within the AMERICAN PHARMACEUTICAL ASSOCIATION organization is a forward step which will be welcomed not only by the profession of Pharmacy, but also by the medical profession and the public

If the objectives of this Council are properly publicized, it should be possible to obtain financial support for its organization In my judgment this proposal should be made one of the main objectives in the campaign for funds to carry on a wider scope of activities at our Washington Headquarters

(*Motion No 16*) *It is moved by Eberle that the report of the Special Committee on the Proposed Council on Pharmaceutical Practice be received and that the recommendation that the Special Committee be continued for the purpose of developing the plan and presenting a more perfected program to be reported to the Council at the Portland meeting in 1935, be approved* Comments are invited

E F KELLY, *Secretary*

LETTER NO 10

December 28, 1934

To the Members of the Council

50 *Contract for Printing and Mailing the JOURNAL OF THE A PH A for 1935* The following recommendation has been submitted by Chairman DuMez of the Committee on Publications

"I have carefully gone over the bids on the publication of the JOURNAL for next year, received by Dr Eberle, and find the present publishers, namely, the Mack Printing Company, of Easton, Pa., to be the lowest bidders This Company will also give us the best price on reprints I, therefore, recommend to the Council that unless Editor Eberle has some good reason for making a change, the contract for publishing the JOURNAL for the ensuing year be awarded to the Mack Printing Company, of Easton, Pa."

Editor Eberle concurs in the recommendation

For the information of the members of the Council, it is stated that the contract provides for the insertion in each issue of the JOURNAL of forms of sixteen pages, or multiples of pharmaceutical abstracts, with separate paging and indexing, as recommended by the Special Committee on YEAR BOOK (see September 1933, issue, JOURNAL, A PH A, pages 914-916) It is the intention of the Editor of the YEAR BOOK to start the insertion of the abstracts for 1935 in the March issue and to issue the Report of the Progress of Pharmacy for 1934 in the usual form

(*Motion No 17*) *It is moved by DuMez that the contract for printing and mailing the JOURNAL for 1935 be awarded to the Mack Printing Company of Easton, Penna* At the request of Chairman DuMez a vote is called for at this time but will be considered as tentative if there is objection A voting card is enclosed

51 *Budget for 1935* Chairman Philip of the Committee on Finance submits, in accordance with Article II of Chapter II of the By-Laws of the Council, the following report on appropriations and expenditures for 1934, with a suggested budget of receipts and appropriations for 1935 which were prepared by the secretary and approved by the chairman of the Finance Committee The officers and Finance Committee are fully aware of the difficult times we are going through which have resulted in reduced receipts, and several items in the proposed budget have been again reduced, while others must be increased, the total being two thousand dollars more than for 1934 due largely to the increase in the appropriation for maintenance of the Building

"To the appropriation for General Expenses in 1934 two additions were made fifty dollars for the Section on Practical Pharmacy and Dispensing and two hundred dollars for the American Council on Pharmaceutical Education Of the appropriations two have been exceeded to December first The disbursements for maintaining the Headquarters Building were \$2929 92 against \$1800 00 and the disbursements for the Scientific Section were \$29 97 against \$25 00 The latter is within the \$50 00 limit for which Council action is not required In submitting the budget for 1934 it was stated that the expenses of maintaining the Building could not be estimated, and when the expenses for the year are known, a motion to increase the appropriation will be submitted The expenses of the Committee on the Proposed Council on Pharmaceutical Practice were contributed through Chairman Cook Charges to December 1st for General Expenses were \$14,947 52 against \$21 380 00 appropriated Every effort has been made to keep the expenses below the budget appropriations

"Under the appropriations for open accounts to December 1st, the JOURNAL charges were \$7371 58 against the \$11,000 00 appropriated, the N F \$3092 98 against the \$1000 00, and the Recipe Book \$665 85 against the \$500 00 No charges were made against the appropriation for

\$50 00 for Badges and Bars Charges to December 1st were \$11,130 41 against the \$12,550 00 appropriated

"To December 1st the total budget charges were \$26,077 93 against appropriations of \$33,680 00 for the year, so we will not exceed our total budget

"The receipts to December 1st show considerable variation from the estimates From Dues, \$7369 84 as compared to \$7727 38 for the same period in 1933 Every effort has been made to hold this figure up, but many explain that they cannot afford the expense Bills for dues for 1935 were mailed on December 1st and we cannot say what the total for the year will be From the JOURNAL, \$8529 85 as against \$7271 15, which is very satisfactory under present conditions From the N F \$4712 36 for the year as against the estimate of \$3500 00, which is very encouraging From the Recipe Book, \$1417 78 for the year against the estimate of \$1000 00, which shows a decided gain \$2000 00 has been billed to the U S P Board of Trustees for the YEAR BOOK, Volumes 20 and 21, and sales were \$45 68 to December 1st

"It has been necessary to use the income from the Life Membership Fund for the year and to transfer \$1000 00 of accumulated interest to the Current Fund "

BUDGET FOR 1935

It is very difficult to estimate receipts under present conditions As the receipts from the sales of the National Formulary and of the Recipe Book are always approximate, the estimates for 1935 are based on the receipts for 1934 The following is suggested

Interest	\$ 100 00	
Dues	12,500 00	
Interest Life Membership Fund	5 500 00	
JOURNAL	9,500 00	
National Formulary	4,500 00	
Recipe Book	1,500 00	
YEAR BOOK	2,200 00	\$35 800 00

APPROPRIATIONS FOR GENERAL EXPENSES

No 1	Salaries	\$11,700 00
No 2	Maintenance of Building	3 500 00
No 3	Telegraph and Telephone	200 00
No 4	Clerical Expenses	1,200 00
No 5	Printing Postage and Stationery	700 00
No 6	Office Supplies	150 00
No 7	Traveling Expenses	500 00
No 8	Premium on Bonds	50 00
No 9	Auditing	75 00
No 10	Certificates	50 00
No 11	Miscellaneous	200 00
No 12	Scientific Section	25 00
No 13	Section on Education and Legislation	25 00
No 14	Section on Practical Pharmacy and Dispensing	25 00
No 15	Section on Commercial Interests	25 00
No 16	Section on Historical Pharmacy	25 00
No 17	Commission on Proprietary Medicine	25 00
No 18	Committee on Local Branches	25 00
No 19	Committee on Membership	250 00
No 20	Committee on State and National Legislation	50 00
No 21	Committee on Syllabus	50 00
No 22	Committee on Pharmacy Week	250 00
No 23	Inter-Society Color Council	25 00
No 24	International Pharmaceutical Federation	120 00

No 25	Metric Association	10 00	
No 26	American Conference on Hospital Service	25 00	
No 27	American Council on Pharmaceutical Education	200 00	
No 28	YEAR BOOK	3,500 00	
No 29	Library	50 00	\$23,030 00

APPROPRIATIONS FOR OPEN ACCOUNTS

No 30	JOURNAL		
	(a) Publication	\$9,500 00	
	(b) Electrical Expenses	1,000 00	
	(c) Postage and Stationery	300 00	
	(d) Freight, Drayage and Miscellaneous	200 00	\$11,000 00
No 31	National Formulary	1,000 00	
No 32	Recipe Book	500 00	
No 33	Badges and Bars	50 00	\$12,550 00
			\$35 580 00

' It will be necessary to curtail expenses wherever possible, to keep the JOURNAL within the appropriation which will mean abstracting or condensing many papers and articles, and to advance the extra charges for the completion of the revision of the N F and the Recipe Book. When the Budget for 1934 was submitted, it was stated that the cost of maintaining the Headquarters Building could not be accurately estimated. The expenses for maintenance for the year have amounted to approximately \$3200 00 and, with this experience, it is believed that the \$3500 00 included in the budget for 1935 will be sufficient "

(*Motion No 18*) *It is moved by Philip that the Budget for 1935 be approved as submitted* With the approval of the Chairman of the Council, a vote is called for at this time. It will be considered as tentative if there is objection.

52 *Selection of Auditors* The Chairman of the Committee on Finance recommends the employment of W A Johnson & Co, Baltimore, Md, to audit the accounts of the ASSOCIATION for 1934, in accordance with Article 8 of Chapter IV of the By-Laws. This Company has audited the accounts since 1922. The appropriation for the audit has been \$75 00 for each year.

(*Motion No 19*) *It is moved by Philip that W A Johnson & Co be employed to audit the accounts of the ASSOCIATION for 1934*

53 *Applicants for Membership* The following applications properly endorsed and accompanied by the first year's dues have been received:

No 77, Thomas W McKelvey, 3123 Union St, Bellaire, Ohio, No 78, Yeznig P Balouny American University, Beirut, Syria, No 79, Aram K Ojakian, American University, Beirut, Syria, No 80, Frank J Zuck, 201 Rockford National Bank Bldg, Rockford, Ill, No 81, Julius Meyenberg, 114 Main St, LaGrange, Texas, No 82, Leroy P Baker, 1615 N W 27th Ave, Portland, Oregon, No 83, Richard H Waterman, 613 Orpington Rd, Catonsville, Md, No 84, James Herzog, 3168 Main St, Buffalo, N Y, No 85, Augustus C Taylor, 1733 Upshur St, Washington, D C, No 86, Donald G Sellner, 3015 Huntington Ave, Omaha, Nebr, No 87, John J Goodyear, 2049 Meridian St, Indianapolis, Ind, No 88, Roy A Perry, 1239 S W Jefferson, Portland, Oregon, No 89, Thomas Schratz, 208 Lincoln Ave, Pittsburgh, Penna, No 90, William F Siegel, 241 West Fifth St, Erie, Penna, No 91, Philip R Marsh, 331 Second St, Aspinwall, Penna, No 92, Dale W Yontz, Fifth St, Newell, W Va, No 93, Bernard F Stairs, 426 Main St, Mt Pleasant, Penna, No 94, Rosella Lois Corsello, 3712 Brighton Rd, Pittsburgh, Penna, No 95, Albert J Gabig Jr, 319 Reamer Ave, Carnegie, Pa, No 96, Inez W Henderson, 410 1/2 N Third St, Jeannette, Penna, No 97, Irene Klein, Presto, Penna, No 98, A R Beamon, 157 W 61st St, Los Angeles, Calif, No 99, Chieko Otsuki, 70 S W Salmon St, Portland, Oregon, No 100, Victor R Taylor, 1644 S E 40th Ave, Portland, Oregon, No 101, Edward Meyer, College Station, Pullman, Wash, No 102, Harold C Freed

Route 3, Pullman, Wash , No 103, Mary Schoessler, 300 Campus Ave , Pullman, Wash , No 104, Anna Brockway College Station Pullman, Wash , No 105, Anna Merchen, 904 Campus Ave , Pullman, Wash , No 106, Ray C Scholterer, 41 Park Row, New York, N Y , No 107, George D Jenkins, 3rd and State Sts , Harrisburg, Penna , No 108, Pierre G Bassett, 21 Scamore St , New Bedford, Mass , No 109, W E Luthy, 2546 Lorain Ave , Cleveland, Ohio
(Motion No 20) Vote on applications for membership E F KELLY, Secretary

TESTIMONIAL DINNER TO R P FISCHELIS, PRESIDENT OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, HOTEL PENNSYLVANIA

The Testimonial Dinner on January 10th, tendered to President R P Fischelis, by the New York Branch of the A Ph A , was largely attended by members and visitors. The program of the function was well arranged and carried out under the direction of Chairman Hugo H Schaefer, assisted by the Dinner Committee. The participants included members from New York and New Jersey, others came from Philadelphia, Washington and other cities.

Dr C W Ballard, president of the New York Branch of the A Ph A , presided as Toastmaster. On the dais were seated the honored guests, President and Mrs Fischelis, Dr and Mrs H V Army, Dr and Mrs C W Ballard, Dr and Mrs Charles Elliott, Charles J McClosky, Dr A C Morgan.

Toastmaster C W Ballard, president of the New York Branch, A Ph A , after making introductory remarks, called on Dr A C Morgan, emeritus professor of Clinical Medicine of Temple University, who reviewed the professional activities of the honored guest.

Charles H Elliott, Commissioner on Education of the State of New Jersey, was next introduced, he spoke of the activities of the guest of honor in educational matters.

Charles J McClosky, former president of New Jersey Pharmaceutical Association referred to the activities of Dr Fischelis in association and board of pharmacy matters. He was followed by former president of the A Ph A , Dr H V Army, who spoke of associated activities and gave his address a personal touch.

The honored guest in his address discussed the activities of the AMERICAN PHARMACEUTICAL ASSOCIATION and presented his plans for greater coordination of its divisions and for larger membership.

President Fischelis was presented with a certificate of Life Membership in the AMERICAN PHARMACEUTICAL ASSOCIATION, by the New York Branch and Mrs Fischelis with a beautiful bouquet. New Jersey Pharmaceutical Association presented Dr Fischelis with a gavel of an historical source.



Guests at the Testimonial Dinner, honoring Dr R P Fischelis, President of the AMERICAN PHARMACEUTICAL ASSOCIATION, by New York Branch A Ph A January 10, 1935

PROCEEDINGS OF THE LOCAL BRANCHES

"All papers presented to the Association and Branches shall become the property of the Association with the understanding that they are not to be published in any other publication prior to their publication in those of the Association, except with the consent of the Council "

—Part of Chapter VI, Article VI of the By-Laws

ARTICLE III of Chapter VII reads "The objects and aims of local branches of this Association shall be the same as set forth in ARTICLE I of the Constitution of this body, *and the acts of local branches shall in no way commit or bind this Association and can only serve as recommendations to it* And no local branch shall enact any article of Constitution or By-Law to conflict with the Constitution or By-Laws of this Association "

ARTICLE IV of Chapter VII reads "Each local branch having not less than 50 dues paid members of the Association, holding not less than six meetings annually with an attendance of not less than 9 members at each meeting, and the proceedings of which shall have been submitted to the JOURNAL for publication, may elect one representative to the House of Delegates "

Reports of the meeting of the Local Branches shall be mailed to the Editor on the day following the meeting, if possible Minutes should be typewritten with wide spaces between the lines Care should be taken to give proper names correctly and manuscript should be signed by the reporter

BALTIMORE

The regular monthly meeting of the Baltimore Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held at the Hotel Emerson, Friday, December 21, 1934 The meeting was called to order by President B Olive Cole who introduced the speakers of the evening

The first speaker, Wm B Baker, of the School of Pharmacy, University of Maryland discussed his recent work on the standardization of aconite preparations Mr Baker pointed out in the course of his address that the conflicting reports of early investigators on the value of aconite as a therapeutic agent are believed due primarily to the fact that the drug and its preparations decrease rapidly in potency The instability of the drug and its preparations is believed to be caused by the decomposition of the active principle aconitine

Experimental studies were made with the object in view of determining the rate of deterioration of aconite preparations, and of determining which of the stabilizers in use are the most efficient Incidentally, the accuracy of the U S P X method of assay was also studied It was concluded that the use of hydrochloric acid as a stabilizer for tincture of aconite is superior to acetic and hypophosphorous acid as stabilizers provided the preparations are adjusted to the correct hydrogen-ion concentration (p_H 2.3-3.0), that aconite in the form of the whole drug deteriorates rapidly and the powdered drug even more so, that the resistance of guinea pigs to aconitine is consistent, provided the weight range specified by the U S P X is strictly adhered to, and further provided that these guinea pigs are in absolutely healthy, normal condition, and that the advisability of the use of aconitine as a bio assay standard should receive more extensive consideration

The second speaker Wm H Hunt, of the School of Pharmacy, University of Maryland, discussed the bio assay of strophanthus preparations The therapeutic classification of the drug was given and this was followed by a discussion of the chemistry of strophanthus It was pointed out that a considerable amount of criticism has been directed at the various bio-assay methods of strophanthus preparations After careful investigation it was pointed out that the modified Hatcher-Brody cat method, the Trevan mortality curve frog method as modified by Chapman and Morrell, and the U S P X one hour frog method, all had been found to yield results which agreed within the limits of experimental error Mr Hunt further stated that the Knudson and Dresbach chemical method of assay was observed to yield inconsistent results which were rarely in agreement with the results obtained by the physiological methods

The last speaker Harry Rosen, also of the School of Pharmacy University of Maryland, selected as his topic, "Pyrethrum " Among other interesting things about pyrethrum discussed by Mr Rosen the following was especially interesting It was pointed out that reference to another pyrethrum, *anacyclus pyrethrum*, or pellitory occurs in the literature and one should always indicate the particular pyrethrum intended The pyrethrum known as insect flowers was

the topic of discussion. The historical and commercial aspects of pyrethrum were presented. In reviewing the chemistry of the subject it was pointed out that some volatile substance other than the pyrethrins which possess toxic activity occurs in the drug. The difference in toxicity of the drug to warm and cold blooded animals was pointed out. Finally, the various chemical and physiological methods of assay were discussed.

The papers were discussed by Drs. A. G. DuMez, R. S. Fuqua, M. R. Thompson, John Glassford, J. C. Bauer, and others present.

A rising vote of thanks was tendered to the speakers for their interesting papers.

Before adjournment, President Cole appointed the Nominating Committee for the year 1934. This committee, it was pointed out, is expected to report at the January meeting in 1935.

The committee consists of the following: *Chairman*, Aquilla Jackson, *Mrs. Grace Lotz* Kahler and Simon Solomon. *C. Jelleff Carr, Secretary*.

JANUARY

The first meeting in 1935 of the Baltimore Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held at the Hotel Emerson, Friday, January 11th. President B. Olive Cole was in the chair.

The president reported on the activities of the Branch during 1934 and pointed out the general success of the organization for the year. The secretary-treasurer reported that the average attendance for the six meetings in 1934 was fifty members. The total membership now standing at 170. Particular attention was called to the new student membership in the AMERICAN PHARMACEUTICAL ASSOCIATION presented by the Branch annually to some student selected by the Faculty of the School of Pharmacy, University of Maryland.

The minutes of the December meeting were read by the secretary-treasurer and approved.

The report of the Committee on Membership was read by Chairman Gilbert Joseph. It was moved by C. Jelleff Carr that the report be accepted—carried.

The report of the Committee on Professional Relations was given by Chairman Simon Solomon, who pointed out the activities of Marvin J. Andrews in his U. S. P. and N. F. publicity work in Maryland and expressed the opinion that this was of great benefit in bringing about better professional relations between the physician and the pharmacist. In addition he mentioned the possibility of pharmacists conducting clinical laboratories or engaging in more professional types of activities. The report was discussed by Dr. A. G. DuMez who pointed out the opposition which the American Medical Association feels toward clinical laboratories conducted as accessories to retail pharmacies. He expressed his inability to understand why pharmacy students upon graduation go into purely commercial enterprises. Dr. DuMez stated that, in his opinion, the consolidation of the forces of pharmacy was necessary and that a decided effort should be put forth by pharmacists to bring about such a consolidation. Dr. John C. Krantz, Jr., stated in discussing the problem, that the over-production of pharmacists by the schools of pharmacy was of paramount importance in producing many of our problems. It was moved by Wm. F. Reindollar that the report of the Committee be accepted—carried.

The report of the Committee on Education and Legislation was presented by Dr. A. G. DuMez. The work of the National Association of Boards of Pharmacy and American Association of Colleges of Pharmacy was mentioned. The status of the new food and drugs bill introduced into the new Congress by Senator Copeland known as S. 5 was discussed. Dr. DuMez expressed the belief that some satisfactory bill would eventually be evolved whereby the old Food and Drugs act of 1906 could be amended to the satisfaction of all agencies concerned. It was moved by Wm. F. Reindollar that the report be accepted. The motion was seconded and carried.

The report of the Committee on Science and Practice of Pharmacy was presented by Chairman R. S. Fuqua, the report was comprehensive and exceedingly interesting. It was moved by Wm. F. Reindollar that the report of this committee be accepted with thanks and the committee discharged—carried.

The report of the Nominating Committee was given by Simon Solomon. After discussion the following were nominated for offices for 1935: *President*, Wm. F. Reindollar, *Vice President*, A. N. Hewing, *Secretary-Treasurer*, C. Jelleff Carr. The secretary was instructed to cast the ballot in accordance with the wishes of the Nominating Committee.

After installation of the officers President Reindollar appointed the following committee chairmen *Membership*, Gilbert Joseph, *Professional Relations*, Marvin J Andrews, *Science and Practice of Pharmacy* Dr J C Krantz, Jr, *Education and Legislation* Dr J C Bauer
C JILLEFF CARR

CHICAGO

The monthly meeting of the Chicago Branch, AMERICAN PHARMACEUTICAL ASSOCIATION, was held on Tuesday, December 18th, at the University of Illinois College of Pharmacy

As this was the close of the year for the Branch the secretary-treasurer, L Templeton, read a report of the financial condition of the Branch This was followed by a report of the committee on nominations for officers for the coming year The nominations were unanimously accepted by the members present They are *President*, G L Webster, *First Vice President*, S W Morrison, *Second Vice President* R A G Linke, *Thrd Vice-President*, H M Emig, *Secretary-Treasurer*, L Templeton, *Delegate to the House of Delegates*, L Templeton, *Committee Chairmen* *Membership*, Thomas F Rylands, *Legislation*, J Riemenschneider, *Practice*, I A Becker, *Medical Relations*, D Bernard Fantus, *Publicity*, A E Ormes

A motion was passed to appoint a committee to draft a resolution against the repeal of the local Arvey ordinance, the repeal of which would prevent the medical schools of the city from using the impounded and unclaimed dogs for research and scientific purposes

The speaker of the evening was O C Durham of the Abbott Laboratories He discussed 'Allergy from the Standpoint of the Manufacturer and Pharmacist' The following is a brief summary of the discussion

The field of allergy is comparatively new Only a few years back the Medical Schools were not giving training in this now important subject

The word "allergy" was coined to mean an over-sensitiveness of the body to some particular thing About ten per cent of the people are affected by some ordinary thing that does not affect the average person

People only recognized the afflictions of allergism less than 100 years ago An English doctor afflicted by pollens began an investigation He made collections of pollens, collections of air samples, laboratory tests, skin tests and extractions, this was about 1870

In 1903, a German doctor made serums by injecting the pollens into horses His attention was called to the fact that the horses, by their nature of eating, probably already were inoculated with the pollens The serums obtained were not a success

As late as 1906 most doctors did not think that pollens caused allergisms The idea prevailed that there was not enough pollen in the air to cause a reaction Proof now shows that the per cent of pollen needed to give reactions is very small The treatment now is to inject the pollen in small doses, gradually increasing the doses so that the patient becomes accustomed to the pollen The sufferers should either take these treatments or stay away from the source of the disturbance

Dextrose and water are most commonly used as the vehicle for pollen injection

There are geographical calendar and individual complications in pollen reactions The pollens are caught on glass plates and are easily identified This gives a clue as to what pollens are in the air and narrows down the possibilities of the ones causing the trouble Slides were shown that gave much information as to pollen production, collection, methods of transmission and extraction

The standard treatment is to give sixteen doses with increasing strengths The injections are made hypodermically just below the outer skin Skin reactions are the clue to the offending pollen Many pollens belong to the same botanical group, hence the patient may be sensitive to all these but should be immunized only against those pollens of the group that are in the particular locality

Mention was made of allergisms toward many things that we eat, such as rice, tomatoes and cabbage It was emphasized that all is not known about allergism, why particular substances cause a disturbance with some people and not with others, the exact chemical nature of the substances, or how they act on the tissues of the body However sufficient progress has been made so that day extracts are made of the offending pollens and in most cases give relief to sufferers

L TEMPLETON, *Secretary-Treasurer*

NEW YORK

The December meeting of the New York Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held in the Brooklyn College of Pharmacy, Long Island University, on the evening of December 10, 1934. About ninety members and their guests attended.

As the meeting was called to order, President Ballard expressed the thanks of the New York Branch to the Kings County Pharmaceutical Society for their kind invitation to hold the December meeting in the Brooklyn College of Pharmacy. The report of the secretary was then read and accepted.

Chairman Lehman, of the Committee on Education and Legislation now reported as follows:

A bill is expected to be introduced in the next Congress, instituting Unemployment Insurance, the cost of which is to be met by a 4% tax on pay rolls. Whether the employer or the employee is to pay the tax, has not been decided as yet.

Owing to the defeat of Congressman Clyde Kelly of Pennsylvania, a valuable ally is lost to the sponsors of price stabilization. It is hoped, however, that another strong member of the House of Representatives will take up the burden of introducing another Capper-Kelly bill.

A bill amending the Pure Food and Drugs law will be offered at the next session of Congress. Senator Copeland is preparing an amended Tugwell Bill which he hopes will meet all objections. This was announced by Secretary of Agriculture Wallace on November 24th. An admirable draft of an amended pure food and drugs law was published by W. Bruce Philip, former Washington representative of the N. A. R. D., which could be adopted in its entirety, and fill all requirements.

The NRA has approved the amendment to the Retail Drug Code making the payment of assessments mandatory. The budget is still under consideration, however.

Violators of Code Laws have been found guilty by the courts in New York and Virginia. In New York the violator was guilty of substitution and the one in Virginia violated the minimum price provision.

The committee on legislation of the New York State Pharmaceutical Association intends to introduce several bills in this session of the Legislature, among them one preventing the sale of prophylactic remedies and appliances (for the purpose of preventing venereal infection) by anyone except a registered pharmacist, another, a price stabilization bill similar to the California Law (Little of Junior Capper-Kelly Bill) and also several important amendments to the pharmacy laws.

Mayor La Guardia signed the 2% sales tax law which went into effect December 10th. Sales are taxed on all merchandise except foods, beer, physicians' prescriptions and newspapers. The tax is to be paid by the purchaser in the following manner: All sales of 12¢ or under are free of tax, all sales from 13¢ to 62¢, inclusive, 1¢ tax, all sales from 63¢ to \$1.00, inclusive, 2¢ tax, 1¢ tax on every 50¢ or fraction thereof, when the amount of sale is more than \$1.00.

Regarding the Bronx Drug Clerks Strike, Judge Frankenthaler denied the demand for an injunction against picketing, which was to be foreseen in the present attitude against interference with peaceful picketing. The matter will have to be argued in court.

Dr. Ballard thanked Chairman Lehman for his report and called upon Auditor Bilhuber, for a report. He announced that he had examined the accounts of the Branch and had found everything in perfect order.

Chairman Dauer, of the Committee on Progress of Pharmacy, then reported on several new proprietary preparations, among them: Tuberculin, P. P. D., Theelin in Oil, Ergone (Sensibamin), Larostidin, Gastric-Mucin and others.

President Ballard then announced the appointment of the following members on the Nominating Committee to report at the next meeting: *Chairman*, R. S. Lehman, E. A. Bilhuber and L. N. Brown.

The business part of the meeting being over, the chairman introduced the first guest speaker of the evening, Dr. Frederick Schroeder, who discussed "Modern Medicine in Relation to Prescription Writing."

Dr. Schroeder briefly reviewed some of the good work done in prescription writing propaganda last winter; he expressed the opinion that the plan of approach was, however, not entirely satisfactory, and that results were not sufficient for the time and effort spent.

In conducting the propaganda campaign the following program was followed

- 1 Lecturers were sent to hospitals to discuss prescription writing with internes
- 2 Formularies were mailed monthly to physicians
- 3 The failure of medical schools to teach therapeutics was criticized and efforts were made to reinstate the course
- 4 The exhibit of U S P and N I products provided by Dr Lascoff was frequently used
- 5 Physicians were urged not to write for proprietary products, particularly where a similar product was official

In all this, nevertheless, one important point was ignored, Dr Schroeder maintained and this was the subject he wished to discuss

In introducing his idea, the speaker began by pointing out that therapeutics is a modern branch of medicine. The slow and late development of therapeutics was due to the fact that it is founded on a thorough knowledge of physiology, pathology and pharmacology. It has only been in recent times that great advances were made in these branches. Furthermore, the study of therapeutics was long hampered by a school of therapeutic nihilism.

In the second half of the nineteenth century real progress began with the study of the effects of drugs on animals. The profound effects of organic chemicals were soon discovered and anesthetics and disinfectants came into use. Systematic research was instituted, biochemistry became a science and provided a knowledge of vitamins and endocrines. Endocrine therapy began in 1891 with the administration of thyroid, in 1921, Insulin came into use for diabetes and now we have a remedy for pernicious anaemia—Liver.

Progress in chemo therapeutics and in the development of biological products is progressing rapidly, and new and far more satisfactory remedies have been found for many of the ailments to which man is heir.

The results of all of this have produced the following

- 1 Preparation of medicines goes from pharmacist to manufacturer
- 2 The choice of remedy becomes difficult for the physician, because of intensive advertising
- 3 New standards of value are necessary in comparing these new products

In summing up, Dr Schroeder showed that years ago, for many diseases and ailments numerous prescriptions were written, to day, specific biologicals are available new chemo therapeutic agents, or proper diet rules are followed. Systematic treatment has replaced symptomatic. All this progress in therapeutics has contributed very largely to a reduction in prescription writing. Dr Schroeder suggested that the pharmacist keep himself thoroughly acquainted with these new advances, he should go back to an all drug pharmacy, and should direct his efforts to encouraging prescription writing among veterinarians who still use 'old therapy'.

Following Dr Schroeder, the chairman introduced Dr Jacob Sarnoff who spoke on the "Romance of Surgery."

Unfortunately it is impossible to give, in writing, a satisfactory report of Dr Sarnoff's presentations since most of his material consisted of special moving picture films showing surgical operations in progress. The pictures were greatly admired by every one and the comments made by Dr Sarnoff made the presentation intensely interesting.

In connection with Dr Schroeder's address Dr Sarnoff pointed out that modern surgery was also largely responsible for a reduction in prescription writing.

At the close of Dr Sarnoff's address a rising vote of thanks was accorded both speakers.

RUDOLF O HAUCK Secretary

NORTHERN OHIO

The monthly meeting of the Northern Ohio Branch was held on November 9, 1934, at the Faculty Club of Western Reserve University.

This meeting was given over to discussion of the report of a committee appointed for the purpose of formulating a set of principles of cooperation between the Cleveland Academy of Medicine and the Cleveland Academy of Pharmacy.

The committee reported that in conjunction with a similar committee representing the Academy of Medicine it had adopted an expression of thought in printed form, which will enable

both practicing physician and pharmacist to cooperate with one another for the good of the patient. This expression of thought was approved and a copy of the resolution ordered forwarded to all members on the rosters of the Academies of Medicine and Pharmacy in Cleveland. It reads as follows:

A The welfare of the public requires a close cooperation between an intelligent well-trained medical profession and a pharmaceutical profession equally intelligent and equally well trained in its special field.

B Personal contact between the physician and the pharmacist is essential in securing and maintaining this cooperation.

C The relationship between these two groups is not stationary but will require a continuous modification and elaboration of concepts and principles with changing conditions.

CONCEPTS

Following are the concepts upon which the above principles are based:

- 1 The public is entitled to the best possible medical care.
- 2 Such medical care postulates not alone competent doctors but accurate and ethical pharmaceutical service.
- 3 The natural corollary is that these two are mutually interdependent.
- 4 The mutual understanding of the codes of conduct of the two groups obviously will facilitate the service each can render to the other.
- 5 The establishment of an understanding acquaintance between the pharmacist and the physician who practices in his district is essential for intelligent cooperation.
- 6 The maintenance of this understanding once established depends upon the ability of the pharmacist to meet his obligation as a scientifically trained person.
- 7 This understanding acquaintance is based upon personal contact not only in the pharmacy but in the office of the physician as well.
- 8 Under these circumstances the discussion of mutual problems is facilitated and the obligation of the pharmacist to make available to the doctor information of the progress of pharmacy can be best met.
- 9 Furthermore the public is entitled to the best and most accurate professional pharmaceutical service at the lowest cost consistent with a reasonable profit to the pharmacist for this service.
- 10 Such a service cannot be furnished to the public through the use of proprietary medicines of known or unknown formulas since they are not designed for this purpose.
- 11 The use of proprietaries by doctors, either by prescriptions, sample or word of mouth, tends to favor self-medication with its attendant dangers to the patient.
- 12 It is the obligation of the medical men to be familiar with the action of drugs and prescription writing so that he will not have to take advantage of formulas suggested by proprietary medicine manufacturers or by their detail men.
- 13 The pharmacist by virtue of the accuracy of his information should supplant the detail men.
- 14 The discussion of details of the mechanics of pharmacy will naturally follow the establishment of this cooperation between physician and pharmacist.

By mechanics we mean counter prescribing, office dispensing, methods of handling prescribed proprietaries, cost of extra services aside from cost of materials and true pharmaceutical service and similar details affecting the working relationship between physician and pharmacist.

The ninth meeting of the Northern Ohio Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION for the year 1934 was held at the Faculty Club of Western Reserve University, Cleveland, Friday evening, December 14th.

A resolution was passed directing the secretary to formulate certain by-laws that may be adopted later by the Branch in order that more definite standards of practice may be promulgated in relation to the public and, especially, to the medical profession. The most controversial factors involved are:

- (a) Type of window displays.
- (b) Relative prominence of professional and non-professional items of merchandise on counter displays.

(c) Itemized list of minimum equipment in the prescription department

(d) Minimum list of reference books in library

The following officers for 1935 were elected

President, Harry E Speer, *Vice-President*, Ellsworth Loesch, *Secretary*, Neil T Chamberlin, *Treasurer*, Herbert Decker

Members of the Council are

1935, E D Davy, F W Gehring, Eugene Remy, H E Speer

1936, A L Flandermeyer, W W Hosler, Ellsworth Loesch, Edward Spease

1937, Herbert Decker, Z M Gibson, N E Scribner, A E Walleck

1938, F J Bacon, N T Chamberlin, A P Gegenheimer, E L McFetridge

NEIL T CHAMBERLIN *Secretary*

PHILADELPHIA

The November meeting of the Philadelphia Branch of the A P H A was held at the Philadelphia College of Pharmacy and Science on Tuesday evening, November 13, 1934

The speaker was Dr David Klein, president of the Wilson Laboratories of Chicago, who spoke on glandular products from the pharmaceutical standpoint

He began with a discussion of the present Pharmacopœial assays for substances such as pepsin and suggested that a standard pepsin be used in connection with the present method

For the assay of Pancreatin he suggested the preparation of a better substrate as the starch used at present is liable to be converted in heating

In addition to the assay for powdered Thyroid it would be advisable to include assays for the tablets and capsules as well

He then spoke of desiccation and defatting of glandular products and mentioned the most advisable methods to be used for different glands

The need for chemical tests for products such as anterior and posterior pituitary and liver extract was made apparent

Dr Klein stated that color uniformity was impossible to maintain in ovarian products because of difference in pigmentation of summer and winter foods

He was not in favor of the use of ratios for the determination of the relationship between fresh and dried glandular materials. He suggested the adoption of standard dosages for products such as Thyroid so as to prevent confusion among physicians

Dr Klein concluded his lecture with a discussion of the active principles of the ovary, pituitary, suprarenal and thyroid. Colored pictures of the glands were shown as lantern slides

About 30 minutes of discussion preceded the adjournment

E H MACLAUGHLIN, *Secretary*

F E R A PRESCRIPTION PRICE SCHEDULE

BY L A SELTZER

Prescriptions covered by this schedule are classified as follows: Simple Liquids, Compound Liquid Mixtures, Liquids Administered in Drop Doses, Bulk Powders, Capsules, Powders, Tablets, Suppositories, Ointments, Compound Ointments, Lotions and Gargles

Simple Liquids are those which contain one item only such as a U S P and N F or other liquid preparation commonly carried in readiness for dispensing. In computing the cost of *Simple Liquids*, the material is priced at 15 cents per oz. to which a fee of 25 cents is added, this sum divided by 2 constitutes the price. Thus a 4 oz. mixture should be priced at 43 cents.

Compound Liquid Mixtures are those consisting of two or more ingredients, the dispensing of which constitutes compounding. In computing the price of *Compound Liquids*, the material is priced at 25 cents per oz., to which a fee of 25 cents is added, this sum divided by 2 constitutes the price. Thus a 4 oz. mixture in this class should be priced 63 cents.

Liquids Administered in Drop Doses—In computing the price of prescriptions of liquids administered in drop doses the material is priced at 25 cents per oz., to which a fee of 75 cents is

added, this sum divided by 2 constitutes the price. Thus a 1-oz or 2 oz prescription in this class should be priced at 50 cents and 63 cents, respectively.

Bulk Powders—In computing the price of medicine dispensed in the form of bulk powder the material is priced at 25 cents per oz by weight, to which a compounding fee of 50 cents is added, this sum divided by 2 constitutes the price. Thus a 4 oz prescription in this class should be priced 75 cents.

Capsules and Powders—In computing the price of capsules and powders the material is priced at the rate of 3 cents for each unit, plus a 50 cent fee, this sum divided by 2 constitutes the price. Thus twelve units in either of those two classes should be priced 43 cents.

Tablets—In computing the price of tablets, the price is based on the manufacturer's whole sale list plus $\frac{1}{2}$ cent for each tablet, plus a 50 cent fee, this sum divided by 2 constitutes the price.

Suppositories—In computing the price of suppositories, the material is priced at 5 cents for each unit, plus compounding fee of \$1.00 divided by 2 constitutes the price. Thus, twelve suppositories should be priced 80 cents.

Ointments—In computing the price of ointments, the price of 1 oz, 2 oz and 3 oz, is determined empirically at 50 cents, 75 cents and \$1.00 respectively, which prices are divided by 2. In the event four or more ounces are prescribed, the material is charged at the rate of $12\frac{1}{2}$ cents per ounce plus a \$1.00 fee, the sum in each case divided by 2 constitutes the price. Thus the final price of 1-oz should be 25 cents, 2 oz, 38 cents, 3 oz 50 cents, 4 oz, 75 cents, 6-oz 88 cents, 8 oz, \$1.00.

Compound Ointments are those containing two or more ingredients, the dispensing of which constitutes compounding. In computing the price of *Compound Ointments*, the price of 1 oz 2-oz, 3 oz is determined empirically at 50 cents, 60 cents and 85 cents respectively. In the event that four or more ounces are prescribed the material is charged at the rate of 25 cents per oz plus \$1.00 compounding fee, the sum in each case being divided by 2. (S. L. Hilton suggests a higher basic price for ointments, because of additional time and labor required.)

Lotions—In computing the price of lotions, the material is priced at 10 cents per oz, plus a 50-cent fee, divided by 2 equals the price. Thus, 4 oz calamine lotion should be priced 45 cents.

Gargles—In computing the price of gargles the material is priced at 5 cents per oz plus a 50-cent fee, divided by 2 equals price. Thus, 4-oz Dobell's Solution should be priced 35 cents.

Exceptions—In the event that in any prescription the cost of any ingredient exceeds the amount allotted as material, then the actual net cost of such expensive ingredient should be added to the amount provided for cost of material in any of the above formulas.

Specials—Through your Committee the F. D. R. A. has arranged to supply Insulin at 15 per cent above wholesale cost. Mineral oil, cod liver oil, milk of magnesia, etc., when prescribed in the quantities usually marketed under their respective labels and in case the labels must be replaced by a prescription label giving physician's directions for use are priced as follows: Double the ruling selling price, add 25 cents for labeling fee and divide this sum by 2.

Warning—With reference to prescriptions dispensed which are not U. S. P. or N. F. you are cautioned that the government will not allow a larger fee than a like amount of official preparation would cost. If it exceeds that amount you have recourse to calling the physician or returning the prescription to the patient without filling.

Do not fill prescriptions for bandages, surgical dressings or other preparations which are available for office treatments.

THE ATLANTIC CITY SESSION AMERICAN MEDICAL ASSOCIATION

The fifteen sections of the Scientific Assembly A. M. A., have appointed exhibit committees to assist in the promotion of section exhibits at the Atlantic City session and in the coordination of activities between the Scientific Assembly and the Scientific Exhibit

EDUCATIONAL DIRECTORY

Part IV Educational Associations and Directors, "Educational Directory," 1935, issued by the U. S. Department of the Interior lists the American Association of Colleges of Pharmacy and the AMERICAN PHARMACEUTICAL ASSOCIATION.

EDITORIAL NOTES

THE SOCIAL SECURITY PROGRAM

It is overwhelmingly important," President Roosevelt advised Congress in his special message, "to avoid any danger of permanently discrediting the sound and necessary policy of Federal legislation for economic security by attempting to apply it on too ambitious a scale before actual experience has provided guidance for the permanently safe direction of such efforts"

The *New York Times* states editorially "Although it is truly sweeping in nature, the President's social security program has been carefully worked out with unusual precautions to keep it on a practical basis For this reason it will be disappointing to any who expected the Committee on Economic Security to work miracles But thoughtful students of social problems may be expected to indorse most of the underlying principles out of which this policy has evolved"

UNITED STATES CIVIL SERVICE EXAMINATIONS

The United States Civil Service Commission has announced open competitive examinations as follows Principal Pharmacologist, Senior Pharmacologist, Pharmacologist, Associate Pharmacologist, Assistant Pharmacologist

Applications for the positions named for employment under the Food and Drug Administration, Department of Agriculture, must be on file with the U S Civil Service Commission at Washington, D C, not later than March 11, 1935

The entrance salaries range from \$2600 00 a year for the assistant grade to \$5600 00 a year for the principal grade, subject to a deduction of not to exceed 5 per cent during the fiscal year ending June 30, 1935 as a measure of economy, and also to a deduction of 3 1/2 per cent toward a retirement annuity

Certain specified education and experience are required

Full information may be obtained from the Secretary of the United States Civil Service Board of Examiners at the post office or custom-house in any city which has a post office of the first or the second class or from the United States Civil Service Commission, Washington, D C

BROADCASTS

Purdue University School of Pharmacy, through its Extension Department, is conducting weekly broadcasts at 12 45 to 1 00 P M each Wednesday The chief purpose of these talks is to impress the laity with the facts about their druggist and his position in the community in which he practices

Such topics as "The Prescription," "The Story of Camphor," "Pharmacy in the Home," "The Clinical Thermometer," "Evolution of Drugs" and others are used Druggists are urged to tell their customers to tune in on these talks coming from station WBAA which operates on 890 kilocycles

PUBLIC HEALTH COUNCIL OF KANSAS

The Public Health Council of Kansas, composed of members of the professions of medicine, dentistry and pharmacy, has been organized The officers are *President*, Harry Lutz, M D, Augusta, *Vice-President*, W C Westcott, D D S, Leon, *Secretary*, MacChilds, Pharm D, El Dorado *Treasurer* C M Kelley D D S, El Dorado

The first bulletin of the Council has been issued and gives the history of the organization, its constitution, rules and regulations Units will be established in counties, a purpose is to supply medical and related aid and cooperate in promotions in which one or all of the professions are interested Those desiring information anent the organization may address Secretary MacChilds El Dorado

A NEW BASE FOR SUPPOSITORIES

H Gfeller states that suppositories of cacao butter soon become rancid, and if the fat has a melting point corresponding to the lower limit of the Swiss Pharmacopœia (29° C) they may melt in hot weather He proposes to substitute a hardened arachis oil of m p 32° to 33° C This is a lower melting point than that of the Oleum Arachidis Hydrogenatum of the new Pharmacopœia corresponding to a lower degree of hydrogenation The acid value of this material was 0-3 the iodine value 67.3 It becomes rancid much less quickly than cacao butter, it solidifies quickly, is odorless and colorless The transformation of the unsaturated triolein to tristearin is an advantage as

it facilitates the incorporation of aqueous solutions—*Quarterly Journal of Pharmacy and Pharmacology*

PERSONAL AND NEWS ITEMS.

The Foster Hall reproductions of the songs of Stephen Foster at the central building of the Public Library were donated by Josiah K. Lilly. He devoted years to the study of Stephen Foster's work and established Foster Hall for the perpetuation of the poet's memory.

The *Merchants' Index* publishes an article on "Mankind and Medicines," by Chairman Anton Hogstad, Jr., of the National Pharmacy Week Executive Committee.

Louis Wait Rising, University of Washington School of Pharmacy, comes from Rutgers University. Prior to going to Rutgers, Professor Rising was connected with the University of South Carolina School of Pharmacy as associate professor. He received his pharmacy degrees at Oregon State College. Both Mr and Mrs Rising are natives of Oregon.

Dr Wolfgang Felix von Oettingen, formerly Assistant Professor of Pharmacology at Western Reserve University, Cleveland has been named for the supervision of the Haskell Laboratory of Industrial Toxicology of the E. I. du Pont de Nemours Co., Wilmington, dedicated January 22nd. A complete library is to be provided for use in studying toxicological problems in the field of industrial hygiene.

Tribute is paid to Frederick J. Wulling, a former president of the AMERICAN PHARMACEUTICAL ASSOCIATION, under "American Contemporaries" in the News Edition of *Industrial and Engineering Chemistry*, of January 10, 1935. The writer of the article is C. H. Rogers, whose contact with Dean Wulling enables him to present a pen picture of a man, who is honored at home and by his associates and fellow workers. The article was not read in time to comment on this deserved tribute.

Dr Erwin E. Nelson, of the University of Michigan has been appointed Principal Pharmacologist in charge of the Drug Division of the Food and Drug Administration, according to an announcement by W. G. Campbell, Chief. Doctor Nelson has already assumed his new duties.

Dr Hugh S. Cumming, surgeon general of the United States Public Health Service, returned on December 18th after visiting Buenos Aires to attend the ninth annual Pan American Sanitary Conference.

Eli Lilly & Co. has established under the

auspices of the American Chemical Society a research award of one thousand dollars and a bronze medal to stimulate research in biological chemistry.

Sir Henry Wellcome was decorated with the Cross of the Legion of Honor of France, November 23rd.

C. H. Searle, with Mrs. Searle, is leaving within the next few days on a business trip to Honolulu, Japan, China and the Philippines.

H. J. Holthoefer has been elected for the tenth term as secretary of the Chicago Retail Druggists' Association. This is the 50th anniversary of the organization and the members are putting forth every effort to make this a successful year.

Hajime Hoshi, president of the Hoshi Pharmaceutical Co., Ltd., of Tokyo, which controls almost 20,000 drug stores in the Orient was a recent visitor to New York.

The Winthrop Chemical Company, Inc., manufacturers of ethical pharmaceuticals, has acquired all tangible and other assets of the H. A. Metz Laboratories, Inc., with which it has been closely associated since 1926. Both companies have been engaged for many years in the development of the synthetic chemical industry in the United States.

An old time drug store exhibit was presented to the Milwaukee Public Museum by local druggists. The suggestion for the exhibit came from John Diller who suggested it as a memorial to his brother, George A. Diller.

The Chemical Foundation, Inc., New York City, has favored the JOURNAL with a copy of "The Farm Chemurgic" by Wm. J. Hale. The author instructively presents the importance of the farm to national and industrial life. We have also received from the Chemical Foundation, Inc., a brief in the matter of a proposed reciprocal trade treaty between the United States and Switzerland submitted on behalf of Chemistry in the United States, by Francis P. Garvan, representing the Chemical Foundation, Inc., the Chemical Alliance, Inc., Synthetic Organic Chemical Manufacturers' Association, Manufacturing Chemists Association of the United States. It is a plea for chemical industry in the United States. Every business in the country, including agriculture, is becoming daily more and more dependent upon chemical industry, and the public should be informed.

The Chemical Foundation has also favored us with a reprint copy of a letter to the President from George N. Peck on foreign trade.

SOCIETIES AND COLLEGES

NEW JERSEY FORMULARY

The Committee on Professional Relations of the New Jersey Pharmaceutical Association and Sub Committee on Medical Practice of the Welfare Committee of the Medical Society of New Jersey are cooperating in the development of a Formulary. A series of formulas has been endorsed and from time to time these formulas will be published and thought is being given to supplying a loose leaf binder to physicians for filing the formulas in permanent form.

THE NATIONAL ASSOCIATION OF DRUG CLERKS, INC., TO BE DISSOLVED

Advice has been received that it has been decided to liquidate the Druggists' National Home and dissolve the Illinois Corporation not for profit. The National Association of Drug Clerks.

NEW JERSEY BOARD OF PHARMACY

Failure to display a renewal certificate in New Jersey constitutes a violation of the Pharmacy Act and is punishable by a fine of not less than \$25.00.

The regulations for the Act are entitled 'Pharmacy or Drug Store Defined,' 'Registered Pharmacist Continuously in Charge,' 'Permit Required,' 'Change of Location,' 'Change of Ownership,' 'Prescription Equipment Required,' 'Number of Pharmacists per Store,' 'Display of Permit,' 'Renewal of Permit,' 'Information Required,' 'Temporary Permits,' 'Permit Required of Each Store,' 'Suspension or Revocation of Permit,' 'Failure to Receive Notice No Excuse.'

REVOCATION LAW

The Board of Pharmacy of the State of New Jersey may refuse an application for examination or may suspend or revoke the certificate of a registered pharmacist or a registered assistant pharmacist for any of the following causes. When the application or registration is shown to have been obtained by misrepresentation or fraudulent means, or when the applicant or registrant is guilty of chronic or persistent inebriety, or addiction to the use of narcotic drugs or has been convicted of violating any law of this or any other State or of the United States relating to narcotic drugs or has been convicted of violating the provisions of

any law relating to the sale of liquors, or has been twice convicted of violating any law relating to the practice of pharmacy, or has been convicted of a crime involving moral turpitude, or has impersonated an applicant for registration before the Board. Before a certificate shall be refused, suspended or revoked, the accused person shall be furnished with a copy of the complaint and given a hearing before the Board. Any person to whom a certificate shall be denied by the Board or whose certificate shall be suspended or revoked by the Board shall have the right to appeal by *certiorari* to the Supreme Court for a review of such action."

HOSPITAL ABANDONS LABORATORY PRACTICE IN MEDICINE

The custom of charging private patients in its university hospital for 'purely professional services' by the laboratory departments will be abandoned by George Washington University School of Medicine, in accordance with a resolution which the faculty adopted. This action was taken in order that such purely professional fees may be handled directly between the consultant and the patient. Professional services such as the interpretation of roentgenograms and supervision of administration of roentgen therapy are the responsibility of the consultant, the resolution further points out. On the other hand, the faculty regards the technical work of its laboratories as purely nonprofessional and approves in principle the levying of charges to any person or patient for technical services rendered and for the use of its laboratory facilities. Concluding the resolution, the faculty submits the thesis that the practice of medicine in public or private laboratories, staffed by non professional people, begins only if at all, at the point at which such technical data are interpreted and applied to the patient for the diagnosis, treatment and prognosis of disease processes.

INSECTICIDE, DISINFECTANT ASSOCIATION

Increased support of the code of fair competition and a closer observance of contemplated restrictive legislation pointing toward a revision in Federal and State food and drug acts were urged at the twenty first annual meeting of the National Association of Insecticide and Disinfectant Manufacturers held December 10th and 11th.

Many scientific papers and discussions were read and interest was shown in code matters and the possibility that certain restrictive legislative tendencies would materialize. A committee was appointed to study laws, proposed laws and legislative tendencies affecting manufacturers of insecticides and disinfectants. Dr Robert C White asked the members for continued support. Ovid J Roberts, NRA Deputy Administrator, who addressed the convention Tuesday, was confident that approval of the budget would be made shortly, and urged continued interest in code affairs.

The Association elected the following officers and governors: *President*, C P McCormick, Baltimore, Md., *First Vice President*, W H Eddy, Rochester, N Y., *Second Vice President*, William Griesemer, Baltimore, Md., *Secretary*, John H Wright, New York City, *Treasurer*, John Powell, New York City.

RHODE ISLAND PHARMACEUTICAL ASSOCIATION

Rhode Island Pharmaceutical Association reelected Clarence A Vars, president, Joseph L McDonald, Providence, vice president, and James J Gill, Providence, was reelected secretary-treasurer. The Association, at its annual meeting in Providence on January 9th, voted to submit a list of ten names to the Governor of leading pharmacists qualified to advise relative to pharmaceutical activities. It is understood that the purpose of the administration is to merge all activities of public health professions in one body.

BROOKLYN PHARMACEUTICAL ASSOCIATION

The pharmaceutical associations of Brooklyn have united those bodies in one organization under the name of Brooklyn Independent Pharmacists' Association.

OKLAHOMA PHARMACEUTICAL ASSOCIATION

Oklahoma Pharmaceutical Association is endeavoring to enact a law which will require a licensed practicing pharmacist to supervise the sale of all drugs, poisons or preparations classed as drugs. Another change provides that all moneys received over and above the expenses of the State Board of Pharmacy shall be retained by the Board as a treasury fund for the succeeding year.

Another provision strengthens the law relating to peddling of medicines and another will give to the Board of Pharmacy power to appoint its own attorney to prosecute violations of the law.

PHI DELTA CHI

The Grand Council of Phi Delta Chi, professional fraternity of pharmacy and chemistry, will convene in annual session at the Emerson Hotel in Baltimore, February 7th-8th. Iota Chapter of the University of Maryland College of Pharmacy will be the host.

We have received from pharmacist Svend Nielsen of Copenhagen a reprint on American Pharmacy. Reference is made to the several contributions on professional pharmacy by Professor C B Jordan. The title of the contribution is *Amerikanske Apoteksforhold*.

We are indebted to Secretary H C Christensen for a set of Proceedings, 25 volumes of the National Association of Boards of Pharmacy, from 1908 to 1933.

A serum he described as able to kill cancer cells removed from the human body and do no harm to healthy tissue similarly removed was announced December 5th by Dr Thomas Lumsden, whose last ten years have been devoted to the fight on cancer.

A CORRECTION

Howard H Crosbie, writing relative to his article in November JOURNAL, page 1111, states that the second line under Fig 1, last sentence, should read "Right, After injection of 2 cc—Sept 12 1934," not—*Right*. After injection of 1.75 cc—Sept 26, 1934." He writes that the latter statement invalidates the logic of the reading matter—we are therefore pleased to comply with the author's request in making the correction.

PATRICK J CUDDYER

Patrick J Cuddyer, 73 S Boston druggist active in civic affairs, died November 30th, from a heart attack while in his drug store. His death follows by three weeks that of his wife, Mary E Devine Cuddyer.

Mr Cuddyer was a past-president of the Massachusetts Pharmaceutical Association and of the South Boston Citizens' Association, president of the Trade Association of South Boston and a member of the executive boards of the Boston and National Associations of Retail Druggists.

LEGAL AND LEGISLATIVE

REPORT OF THE COUNCIL ON PHARMACY AND CHEMISTRY ON REVISION OF THE FOOD AND DRUGS ACT IN SPECIAL REFERENCE TO DRUGS

The following report, published in the *Journal of the American Medical Association* of January 12th, is reprinted here as a source of information on the views endorsed by the Board of Trustees of the American Medical Association on Federal food and drug legislation

'1 To include provisions for so regulating all forms of drug advertising that it shall be truthful in statement and not deceptive by implication, the terms 'advertising to include all ways and means of bringing articles to the attention of the public for commercial purposes

"2 To provide that responsibility for advertising rest with the individual or firm issuing it unless such individual or firm produces a guaranty as to the truthfulness of the advertising claims and the guarantor is amenable to the terms of the act in which case the guarantor shall be responsible

"3 To provide that the active ingredients and the amounts or proportions thereof in all mixed drug products not listed in official compendiums (U S P and N F) be disclosed on the labels of such products and in the advertising of them

"4 To prohibit the sale of drugs and drug preparations under names recognized in official compendiums (U S P and N F), unless such drugs and drug preparations meet the standards and specifications laid down in such compendiums

"5 To require suitable declaration on labels and in advertising of any and all habit-forming drugs, whether sold singly or in mixtures together with explicit warning that such may be habit forming, provided that such declaration be not required in the case of drugs or mixtures of drugs dispensed on prescription and which are to be used according to directions of a physician

"6 To provide for official announcement by the government of such drugs as may now be held, or in the future be determined, to be habit forming

"7 To prohibit the mention of disease names on the label of drugs or drug preparations, or in advertising thereof unless such drug or drug preparation is a cure for the disease named, or unless such drug or drug prepara-

tion is a palliative and the nature of the palliative action is stated

'8 To extend the provision of the law to include cosmetics and the advertising thereof the term 'cosmetics' to include all substances and preparations intended for cleansing, altering the appearance or promoting the attractiveness of the person unmedicated soaps excepted

"9 To extend the scope of the term 'drug' to include devices, substances and preparations intended for the treatment of disease and all devices and all substances and preparations, other than food, intended to affect the structure or any function of the body, this provision to be for purposes of the act and not to regulate legalized practice of the healing art

'10 To prohibit the addition of drugs to foods and confections intended or offered for general human consumption but not to prohibit such addition to, or other modification of foods and confections intended or offered to meet special nutritional requirements or dietary needs, provided the label and advertising of products so treated plainly declare the character and purpose of such modifications

"11 To require that testimonials and opinions used in advertising of drugs and drug preparations be accompanied by the name and address of the writers thereof and to consider such testimonials and opinions as advertising claims of the advertiser

12 To provide by permit or license or other means for government control over the sale and distribution of such drugs and therapeutic agents as cannot be adequately controlled by gross inspection or chemical examination of the finished product except that this shall not apply to the provisions of the Serums and Vaccines Act of 1902 and amendment thereto

"13 To require each importer, manufacturer, jobber and retailer engaged in interstate commerce in drugs and therapeutic agents to register with the government his name, place of business and the character of the business in which he is engaged or proposes to engage, such registration to be granted without cost to the applicant and accepted only on evidence showing adequacy of plant equipment and personnel for the business proposed

"14 To provide for cooperation between federal and state governments in the enforcement of food and drug laws in their respective

jurisdictions on a plan similar to that provided in 'An Act to Create in the Treasury Department a Bureau of Narcotics, and for Other Purposes, approved June 14, 1930'

15 To require labels on drugs and drug preparations to bear the name and address of the manufacturer, seller or distributor, and to bear a statement of the net weight or volume of contents

'16 To provide for more adequate penalties, which will be commensurate with the seriousness of violations "

FOOD AND DRUG BILLS IN CONGRESS

There are now three bills in Congress which seek to amend or displace the present Food and Drugs Act, and there is a possibility for the presentation of others

Senator Royal S. Copeland has introduced S 5 and this has been referred to the Committee on Commerce

Representative James M. Mead of Buffalo, N. Y., has presented H. R. 3972 and this has been referred to the Committee on Interstate and Foreign Commerce

The *Druggists Circular* states that the Mead bill differs from the Copeland and McCarran bills in the senate in three major particulars (1) It would amend the existing act, rather than write a wholly new law, (2) its definitive provisions are specific rather than a greater or less delegation of authority to the Secretary of Agriculture, (3) it places control of advertising in the hands of the Federal Trade Commission, with injunctive relief in emergency

Senator Pat McCarran of Nevada has introduced S 580 which embodies the revision plan of Charles Wesley Dunn

The numbers of the bills are given so that officers and members of legislative committees can apply to their Senators and Representatives for copies of the bills

The president has not endorsed any of the bills, but is most interested in the enactment of a law at this session of Congress

CAUSES FOR REMOVAL OF CODE AUTHORITIES

An administrative order issued by the Recovery Board states causes for removal of members and employees of code authorities. These are

(1) Conviction of code violation or removal of Blue Eagle involving any firm with which the member is in any way connected

(2) Commission of a criminal, tortious or

illegal act in connection with the activities of the code authority

(3) Conviction of crime involving moral turpitude, after selection as a member of the code authority

(4) Obstruction of the administration of the code

(5) Neglect of duty

NIRB SEEKS TO END MULTI CODE RULES

The National Industrial Recovery Board has approved an order under which retailers will be required to pay only one code assessment regardless of the number of retail codes which affect the business. The principal line of business must be certified

PENNSYLVANIA PRESCRIPTION TAX UPHELD

The Supreme Court of Pennsylvania has ruled that the tax on doctors' prescriptions, provided for in the State Emergency Relief Sales Tax Act of 1932, is legal. The ruling is of importance to druggists, inasmuch as it is estimated that back taxes will have to be paid on a state tax that no longer exists

Prescriptions in Utah come under the 2 per cent sales tax

HEALTH INSURANCE BILL

A resolution calling for "the best and most effective kind of federal legislation to provide a system of health insurance throughout the United States" has been introduced in the Senate by Senator Hugo L. Black of Alabama. It proposes a "full" investigation by the Senate Committee on Education and Labor

Simultaneously, with the introduction of the resolution, the American Association for Social Security made public a social security bill which will be introduced as a model measure in 43 state legislatures

It is understood that Senator Black later will introduce a federal subsidy bill with the social security bill as a basis, plus the findings of the Senate committee

The bill for the states includes a health insurance system under which the great proportion of those earning less than \$3000.00 a year would receive essential medical services and part compensation of loss of income by illness

Basically the social security measure aims at the establishment of a statewide insurance fund supported by employees, employers and

the state The purpose of Senator Black's bill is to provide a subsidy to states enacting health insurance on the lines drawn by the social security bill

Abraham Epstein, executive secretary of the social security organization, declared that the bill is not an attempt to reorganize medicine —
From *Drug Topics*

ADVERTISEMENT BILL

Representative John T Buckbee, of Illinois has introduced a bill under which the mails and radio would be denied to a person disseminating misleading advertising, penalty is provided

TAX-FREE ALCOHOL

Representative Woodruff of Michigan introduced H R 1425 which would authorize the withdrawal of alcohol tax free for the use of any clinic operating for charity and not for profit including use in compounding of bona fide medicines for treatment outside of such clinics but not for sale

BOARD DIRECTED TO ISSUE LICENSE

In a Mississippi case a pharmacist who had been granted a license in Louisiana applied for a license in Mississippi The law makes it mandatory that the State board of pharmacy license as a registered pharmacist any person of good moral character who had after examination been licensed to practice pharmacy in another state prior to December 31 1927 A review of the case states that the Board had taken no action in the matter and hence the court action After review of the case the court reversed the judgment of the lower court and directed the State Board of Pharmacy to issue a license to the applicant to practice as a registered pharmacist

DRUG STORE SIGNS IDENTIFY THE ESTABLISHMENT

The defense in four cases in California were found guilty in each case and appealed their appeals were consolidated Two cases were reversed because the complaint failed to prove and there was no proof adduced to show that the signs designated in the law were displayed on the store owned by the defendants The court accordingly reversed the convictions in these two cases In the other two, because of an error in assessing penalties on these defendants, the cases were remanded to the trial court with directions to impose the proper penalties

WEST VIRGINIA CHAIN STORE LICENSE TAX UPHELD

The right of states to levy a tax on chain stores was upheld by the Supreme Court of the United States in a recent decision of a case brought by the Standard Oil Company of New Jersey

The decision specifically upheld the chain store license tax which is in force in West Virginia

RECOMMENDATION FOR REVISION OF NRA

The National Industrial Recovery Board has received a memorandum from the Consumers Advisory Board containing recommendations for the revision of the National Industrial Recovery Act Although there has been no opportunity for formal consideration of these recommendations, which were submitted January 5th the National Industrial Recovery Board immediately made them public in the belief that discussion of all such proposals is desirable

BLUE EAGLES

The National Industrial Recovery Board announced recently that Blue Eagles for particular trades and industries marked "1934" as well as those originally issued under the President's Reemployment Agreement, may be used in 1935

NARCOTIC PEDLERS SENTENCED

Fifteen narcotic pedlers were sentenced by Judge William H Atwell in the United States District Court at Dallas

TAX COMMISSION REFUNDS IN OHIO

The Tax Commission of Ohio has issued a notice to dealers relative to refunds on unused cosmetic stamps The Cosmetic law was repealed January 1st and there will be no cosmetic tax until after the sales tax receipts are obtainable by dealers

A MISLABELED ELIXIR OF TERPIN HYDRATE AND CODEINE

A qualifying word, such as "special" used in conjunction with the name of a product listed in the National Formulary, is not sufficient legal grounds for varying an N F formula, Judge D J Patterson of the United States District Court, Southern District of

New York, ruled in the case of the United States of America against seized bottles of *Elvir Terpin Hydrate and Codeine*

Testimony showed that the product did not conform to the standard required by the National Formulary. The claimant contended that the word "special" after the name on the label was an indication that the product is not the *Elvir of Terpin Hydrate and Codeine* defined in the Formulary, but is a variation. After hearing testimony Judge Patterson gave the following opinion:

The question is not what the chemist or the druggist may understand by the addition of the word 'special' to the title. The Food and Drugs Act was passed as a protection to the uninformed, that they might be assured that an article purchased was what it purported to be.

Certainly the average consumer would not be put on guard that a compound called '*Elvir terpin hydrate and codeine (special)*' was not the *Elvir of terpin hydrate and codeine* listed in the formulary. The word 'special' might well signify to him merely that the ingredients were especially pure or that the product was manufactured with special care. If a manufacturer wishes to use a National Formulary name for a non-conforming product it is his duty to give the public unmistakable notice that in its composition there has been a departure from the formula given in the Formulary."

The Judge then quoted from the regulations for enforcement of the Food and Drugs Act Regulation 7 (b), which provides: "A drug sold under a name, or a synonym, recognized in the United States Pharmacopœia or the National Formulary which does not conform to the standard of strength, quality or purity for the article as determined by the test laid down therein shall be labeled with a statement to the effect that the drug is not a United States Pharmacopœia or National Formulary article."

On the basis of this, Judge Patterson ruled that the bottles were misbranded.

Judge Patterson also gave his opinion on whether there was adulteration or misbranding on the score that the contents of the bottles did not correspond with the declarations on the labels. His opinion on this read in part:

"The labels stated that each ounce contained one grain of codeine sulphate and eight grains of terpin hydrate. There was testimony by government chemists that on analyses there

was more terpin hydrate than the quantity declared and less codeine sulphate. On the other hand, there was testimony that when compounded the products had precisely the quantities specified on the label, and there was testimony that the test for terpin hydrate is not a satisfactory one.

"The variations found by the government chemists, taken as a whole, are not wide and I am not prepared to say that they are beyond the zone of experimental error and tolerance in manufacture. The burden of proof is on the United States and the proof does not establish adulteration or misbranding by reason of discrepancy between the quantities set forth on the labels and the contents of the bottles.

'There will be a decree of forfeiture for adulteration and misbranding. Findings in conformity with this opinion may be submitted.'—*Drug Trade News*

TAX ON TOILETRIES

It is stated that the battle in Congress will be to prevent an increase in taxes on toiletries and not in an effort to eliminate the taxes.

NEW NRA POLICY OF PUBLICIZING DRUG CODE VIOLATIONS

Settlement of a complaint against Ford's Cut Rate Drug Stores, Buffalo, N. Y., which charged violation of the loss limitation provision of the retail drug code has been announced by the NRA Compliance Division. The settlement, which was in the form of an affidavit signed by Otis C. Altfeld, is the first to be announced by the Compliance Division under a new policy which contemplates full publicity concerning alleged code violations.

Complaint was filed by S. N. Vaughn, secretary of the Buffalo Retail Drug Code Authority. A number of specific violations were charged in an affidavit presented to the board by Mr. Vaughn among them being the selling of many products at cut prices.

The National Industrial Recovery Board has appointed Dr. Gustav Peck as assistant to the Administrative Officer on employment problems in codes and their administration. This appointment is in line with the Board's policy of allotting specific problems to personnel well versed in the subjects assigned them.

Dr. Peck was graduated from Columbia University and received his Ph.D. degree from Brookings Institution.

OBITUARY

FREDERICK BARNETT KILMER

Frederick Barnett Kilmer, director of the laboratories of Johnson & Johnson, New Brunswick N J, and father of Joyce Kilmer, the poet who was killed in action in France, died December 28th, at his home in New Brunswick aged eighty-three years

Mr Kilmer was born in Chapinville, Conn, the son of Charles Kilmer, a Methodist clergyman, and Mary Ann Langdon Kilmer. He was educated in the public schools of Binghamton, N Y, Wyoming Seminary Kingston, Pa, and the New York College of Pharmacy. He took special courses in chemistry at Columbia, Yale and Rutgers. He owned a drug store in New Brunswick before he was chosen to head Johnson & Johnson's scientific department in 1899.

Mr Kilmer had been president of the New Brunswick Board of Health, adviser to the New Jersey State Board of Health and a member of the American Public Health Association. He was a member of a number of foreign and American organizations among them the American Chemical Society, the American Institute of Chemical Engineers, the Chemists Club of New York. He was a former vice president of the American Drug Manufacturers Association and a member of the AMERICAN PHARMACEUTICAL ASSOCIATION since 1886.

Mr Kilmer married Miss Annie E Kilburn December 25, 1871. They had four children all of whom are dead. Mrs Kilmer died three years ago. Further reference is made to the deceased on page 3 of this issue of the JOURNAL.

JOSEPH H DOW

Joseph Henry Dow, member of the AMERICAN PHARMACEUTICAL ASSOCIATION, well and favorably known Maine pharmacist, died at his residence in Portland, December 29th, aged 76 years. He was chairman of the Entertainment Committee when the ASSOCIATION met in Portland.

Mr Dow was born in Portland the son of Joseph and Sara Dow and attended the Portland public schools. He was a charter member of the Portland Cadets, rising in rank to sergeant and 2nd lieutenant, but withdrawing upon his acceptance of a position as a drug salesman with Cook, Everett and Pennell which entailed long absences from Portland. He was one of the original members of the Cadet drill

squad, and in recognition of his interests in this organization and his services to it he was elected every year from 1910 president of the Cadets, and in 1928, life president of the Honorary Association.

As a salesman for two Portland firms and with Brewer and Co. of Worcester, his connection at the time of his death, he traveled all over the State for 55 years and had friends in every community that boasted a drug store.

Partly as a result of this wide acquaintance, Mr Dow conceived the idea of forming the Maine Pharmaceutical Association. He was for many years a member of its executive committee, and for 15 years had been chairman of its committee on general arrangements for the annual meetings.

He was also instrumental in the formation of the Maine Commercial Travelers' Association in which he from time to time held office.

Surviving him are his son, Walter P Dow, two daughters, Mrs Guy F Dunton and Mrs Verner A Stahl, and two brothers George W of West Southport, and Charles now a resident of California. His wife, who was Annie C Curtis of Biddeford, died in 1909.

SMITH C WILSON

SMITH C WILSON, member of the AMERICAN PHARMACEUTICAL ASSOCIATION and prominent in Nebraska drug circles, died December 8th, at Bryan Memorial Hospital, Lincoln, aged 73 years. The following is prepared from a sketch by Secretary J G McBride.

Born at Bergens Mills New Jersey, Mr Wilson came west half a century ago and since that time had been in the drug business. He first went to Cheyenne, Wyoming, and later moved to St. Louis, where he joined Meyer Brothers' wholesale drug house. Mr Wilson then became connected with the Capital Drug Company, a Lincoln wholesale concern, and later entered the retail business.

In 1929, he was elected president of the Nebraska Pharmaceutical Association in which he had worked for forty years. Through his association work he was one of the best known and most influential druggists in the state.

Last February, Mr Wilson was elected president of the Nebraska Society of the Sons of the American Revolution. He was one of the two Nebraska members of the Society of Cincinnati, deriving his eligibility from the

New Jersey branch His descent was through his mother from Captain James Anderson

The following letter from John O'Brien, of Omaha, is reprinted from the *Northwestern Druggist*

"Smith was a man gifted with rare ability. He was vigorous, hopeful and uplifting. He was endowed with great capacity for work, illuminated with a great purpose, unrivalled in aggressiveness, rich in sympathy and consideration for his fellowmen. His genius has often been shown in the constructive work that he did in local, state and national pharmaceutical affairs for the past thirty years. He has served in the ranks. He has served as chairman of every committee in his state organization, and he has filled the office of president with honor to himself and credit to his fellowmen. Smith Wilson was a man of his convictions and he had the moral courage to pass them on to others, not by dictation but by arguments addressed to common sense.

"Mr Wilson's hobby was organization work and he took a great interest in attending conventions and delighted in renewing old friendships. He boasted that he had only missed one meeting of the N Ph A in forty-five years. Almost yearly he attended the conventions of the Iowa, South Dakota, Kansas and Missouri associations. He was a lover of the out-of-doors and never missed a chance to fish or hunt. Only this fall he made a trip of over one thousand miles to hunt pheasants in Dakota.

"He is survived by one son and a grandson, his wife having preceded him in death five years ago."

HUGO KANTROWITZ

Hugo Kantrowitz, member of the AMERICAN PHARMACEUTICAL ASSOCIATION since 1907, died January 18th, at his home in Richmond Hill, N Y, aged 80 years.

The deceased was born in Breslau, Germany, April 8, 1854, and came to this country with his widowed mother and other members of the family in 1856. He received his early education in Philadelphia and as a youth was employed with the *Philadelphia Demokrat*, a German newspaper. In 1878, he removed to New York and engaged with the *New Yorker Zeitung*.

In 1880 the *Deutsche Apotheke Zeitung* was established and in its promotion and service Mr Kantrowitz was active until its discontinuance a few years ago, and as editor and publisher he furthered a relation of German and

American pharmacists which reflects credit. The *Zeitung* was the official organ of the German Apothecaries Society and maintained a professional relationship with other pharmaceutical publications and the editor was always a welcome visitor in their offices. He took a deep interest in the Veteran Druggists' Associations and the German Apothecaries Society and was an honored life-long member of both organizations.

He was a member of New York College of Pharmacy, Columbia University, of New York Pharmaceutical Association, of the German Press Club (New York) and of the Steuben Society of America. He was a regular attendant at the annual meetings of the State association and of the AMERICAN PHARMACEUTICAL ASSOCIATION.

Mr and Mrs Kantrowitz celebrated their golden wedding anniversary in 1926, the latter and a daughter, Mrs Claire Muller, survive the deceased. Nathaniel Nicolai in speaking of him said: "At an age well past seventy—he enjoyed life more like a youth just experiencing his first freedom. More than fifty years he served pharmacy—loyally, unselfishly, gladly, efficiently. He served both continents—was known in Europe as well as in the United States, the country of his adoption, was universally respected and beloved. The German apothecaries here, owe much to his life and work."

ISRAEL H. SHURTLEFF

Israel Hammond Shurtleff, member of the AMERICAN PHARMACEUTICAL ASSOCIATION since 1875, died in New Bedford, Mass., on December 15th, while engaged in his pharmacy, a business founded by him in 1878.

Mr Shurtleff was born in Mattapoisett, Mass., April 7, 1849, the son of Alvah and Joana Shurtleff. After the completion of his earlier education he engaged with James E. Blake and, later, with William A. Pease of New Bedford. In 1878, he entered business on his own account and continued actively until his death, his son, Frederick A. Shurtleff, is now the manager of the pharmacy. Mr and Mrs Shurtleff celebrated the golden anniversary of their marriage in 1880.

Mr Shurtleff had been a member of the Massachusetts State Pharmaceutical Association since its organization and a member of the Independent Order of Odd Fellows for more than fifty years.

BOOK NOTICES AND REVIEWS

Our Willie By JOHN URI LLOYD author of Etidorpha, Stringtown on the Pike Red Head, Warwick of the Knobs Scroggins, Felix Moses the Beloved Jew Published by John G Kidd & Son, Inc Cincinnati 375 pages Price \$2 50

In reviewing a book by one who has contributed largely to the success of the AMERICAN PHARMACEUTICAL ASSOCIATION, has served well in its offices and held membership in it for a longer period of time than any other member and is still deeply and actively interested, the reviewer very willingly permits the promptings of friendship and regard to accompany his thoughts even though they do not enter into these lines Preceding books by the same author were read by this writer as issued and copies of them are part of his library—this personal note will be pardoned

This year the author of *Our Willie* celebrated his 85th birthday and the story is published more than thirty years after a large part of it had been written, it was completed because of a promise to Mrs Lloyd a few days before her departure on November 27, 1932

Our Willie may be designated a companion volume to *Stringtown on the Pike* in it the author introduces Silas and Sarah, of the primitive highlanders of Boone County, Kentucky The love for their son who has brought hope and happiness to their humble home also becomes the source of grief The characters depicted play their part before the readers—pathos, humor and thrilling action form a trinity that endows the plots and counterplots of the book with the vividness of reality, spiced with a mystery that intrigues the reader's interest "

Clara is the heroine, the childhood sweetheart of *Our Willie* is constantly loyal, "Judge Elford is the lovable but just judge who impresses the readers with the majesty as well as the humanity of the law, Squire Gettem is the villain, who is the nemesis of *Our Willie*, of Silas and Sarah of the slave boy Kola and who almost outwits Judge Elford "

Daily life of the section night echoing with muffled hoof beats and war days add to the action of the story

The illustrations are interesting they are from photographs by Mrs J U Lloyd, Olita Lloyd daughter of J T Lloyd, and the author is the youthful fisherman in the frontispiece J K Lilly has contributed a reproduction of

the front cover of Stephen A Foster's Melody, "Willie We Have Missed You," dated 1854

Hand Book of Chemistry Compiled and edited by NORBERT ADOLPH LANGE, Ph D, Assistant Professor of Organic Chemistry at Case School of Applied Science, Lecturer in Organic Chemistry at Cleveland College of Western Reserve University, member of the American Chemical Society and of the Deutsche Chemische Gesellschaft—assisted by Gordon M Forker and Richard Stevens Burington, Ph D, Assistant Professor of Mathematics at Case School of Applied Science, published by Hand Book Publishers, Inc Sandusky, Ohio 1545 pages Price \$6 00 Bound in fabricoid

This Hand Book of Chemistry differs from other books of this kind because of the large amount of material contained for those engaged in all divisions of the chemical industry The author states that this book is the result of a number of years' experience in compiling and editing of data useful to chemists An effort has been made to select material to meet the needs of chemists who should have the information at hand or without prolonged search and for those who have not the facilities of a large technical library

In glancing through the pages one is impressed with the successful effort made to select a great variety of information from all branches of science as well as in the commercial fields The information presented is in condensed form, much of it arranged in a tabular way so as to conserve space and give the information that is needed by chemists, physicists mineralogists, engineers librarians patent attorneys, pharmacists dieticians manufacturers, physicians and others Thus are tabulated physical constants of inorganic compounds, nomenclature of organic compounds, names and formulas of organic radicals are given together with information regarding name synonym, formula boiling and melting points etc Other tabulations are concerned with properties of materials as to their physical, thermal properties, etc

Among outstanding new features is information regarding hazardous chemicals their handling, changes in atomic weight, between 1894 and 1933, a mineral table tables for water chemists classification of crystals, organic reagents, laboratory solutions, etc

Other pages are given over to refrigeration antifreeze solutions, definitions of pharmaceutical terms and various conversion factors

A number of pages list and define laboratory solutions A number of pages are given to laboratory arts and recipes More than 200 pages are devoted to logarithms in varied calculations and applications

The extent of information given is represented by the index of thirty pages

Modern Drug Encyclopedia and Therapeutic Guide by JACOB GUTMAN, M D, Phar D F A C P Consultant, Manhattan General Hospital New York, Riverside, Shore Road Williamsburg Maternity and Borough Park General Hospitals, Brooklyn, formerly Professor of Materia Medica, College of Dentistry University of State of New Jersey, Professor, Clinical Chemistry, Jersey City College of Pharmacy, Instructor in Medicine New York Post Graduate Medical School and Hospital Attending Physician, Wyckoff Heights and Unity Hospitals, Brooklyn Publisher, Paul B Hoeber, Inc 76 Fifth Ave., New York 1394 pages Price \$7 50

The author states that this treatise is designed to meet the demand of the progressive physician for information concerning the most modern therapeutic agencies placed at his command by research laboratories It presents without bias or comment all the popular non pharmacopœial preparations and other remedies found useful in the treatment of disease

The contents is presented in 15 chapters including the following 1040 Drugs of Known Constitution and Action, 408 Effective Combinations of Two or More Fully Defined Ingredients, 346 Preparations of Unstated or Incompletely Defined Components, 860 Endocrine Preparations, 1563 Hypodermic Medicaments, 535 Biologicals, 2223 Individual and 121 Group Allergens 209 Foods and Beverages, 122 Bottled Mineral Waters, Natural and Artificial 644 Miscellaneous Products, Therapeutic Guide, Bibliography, Manufacturers and Distributors' Index, Drug Index

The titles of the divisions indicate the purpose and scope of the book, for which there is evidently a need and the extent of the references is presented by an index of 220 pages The encyclopedia deals largely with medicinals that are controlled by manufacturing houses and gives the name of each house in connection

with that of the medicinal, one section of the book is given over to an alphabetical list of the names and addresses of the manufacturers under each of which names is a list of the house's specialties

Most of the information contained in the volume may be found in medical and pharmaceutical publications and literature sent out by manufacturers, but reference thereto is not readily located unless indexed, hence physicians, pharmacists, dentists and nurses will find "The Encyclopedia and Therapeutic Guide" a valuable time saver

WAGNER BILL S 1130

The Committee on Economic Security in a report states that it is not prepared *at this time* to make recommendation for a system of health insurance Cooperation has been asked of advisory groups representing the medical and dental professions and hospital management in the development of a plan for health insurance which will be beneficial alike to the public and the professions concerned

Senator Wagner of New York has submitted S 1130, known as the Wagner Bill for Social Insurance which provides for a social insurance board appointed by the President The Committee on Economic Security recognizes that the successful operation of a plan depends in a large measure upon the provision of sound relations between the insured population and the professional practitioners or institutions furnishing medical services under the insurance plan

The report of the Committee submits the main lines along which its studies are proceeding The fundamental goals of health insurance, the administration of the services of the medical professions exclusion of commercial or other intermediary agents the basis of benefits of the insurance the payments for the service, state wide basis under a federal law cash payments in partial replacements of wage loss, cost of health and medical services, correlation of existing health and medical services health and medical services for persons without income

The Committee concludes that—'The role of the federal government is conceived to be principally (a) to establish minimum standards for health insurance practice and (b) to provide subsidies, grants or other financial aids or incentives to states which undertake the development of health insurance systems which meet the federal standards

As the measure will affect pharmacy, it is necessary for pharmacists to study its trend so that they may coöperate in shaping this important legislation

NOTICE TO CONTRIBUTORS TO THE JOURNAL AMERICAN PHARMACEUTICAL ASSOCIATION

The following notice has been prepared from comments received from members of the Board of Review of Papers and of the Publication Committee

Manuscripts should be sent to Editor E. G. Eberle, 2215 Constitution Ave., N. W., Washington, D. C.

All manuscripts should be typewritten in double spacing on one side of paper 8 $\frac{1}{2}$ x 11 inches and should be mailed in a flat package—not rolled. The original (*not* carbon) copy should be sent. The original drawings, not photographs of drawings, should accompany the manuscript. Authors should indicate on the manuscript the approximate position of text figures. All drawings should be marked with the author's name and address.

A condensed title running page headline, not to exceed thirty-five letters, should be given on a separate sheet and placed at the beginning of each article.

Numerals are used for figures for all definite weights, measurements, percentages and degrees of temperature (for example 2 Kg, 1 inch, 20.5 cc, 300° C). Spell out all indefinite and approximate periods of time and other numerals which are used in a general manner (for example one hundred years ago, about two and one half hours, seven times).

Standard abbreviations should be used whenever weights and measures are given in the metric system e. g. 10 Kg, 2.25 cc, etc. The forms to be used are cc, Kg, mg, mm, L and M.

Figures should be numbered from 1 up, beginning with the text figures (line engravings are always treated as text figures and should be designed as such) and continuing through the plates. The reduction desired should be clearly indicated on the margin of the drawing. All drawings should be made with India ink, preferably on white tracing paper or cloth. If coördinate paper is used, a blue-lined paper must be chosen. Usually it is desirable to ink in the large squares so that the curves can be more easily read. Lettering should be plain and large enough to reproduce well when the drawing is reduced to the width of a printed page (usually about 4 inches). Photographs intended for half tone reproduction should be securely mounted with colorless paste.

'Figure' should be spelled out at the beginning of a sentence, elsewhere it is abbreviated to 'Fig.," per cent—2 words.

The expense for a limited number of figures and plates will be borne by the JOURNAL, expense for cuts in excess of this number must be defrayed by the author.

References to the literature cited should be grouped at the end of the manuscript under the *References*. The citations should be numbered consecutively in the order of their appearance (their location in the text should be indicated by full sized figures included in parentheses). The sequence followed in the citations should be: Author's name (with initials), name of publication, volume number, page number and the date in parenthesis. Abbreviations for journals should conform to the style of *Chemical Abstracts* published by the American Chemical Society.

(1) Author A. Y., *Am. J. Physiol.*, 79, 289 (1927).

Papers presented at the Sections of the AMERICAN PHARMACEUTICAL ASSOCIATION's annual meeting become the property of the Association and may at the discretion of the Editor be published in the JOURNAL. Papers presented at these Sections may be published in other periodicals only after the release of the papers by the Board of Review of Papers of the JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

The Editor will appreciate comments from Board of Review and Committee on Publication members, authors and others interested.

THE UNITED STATES PUBLIC HEALTH SERVICE

PARTS OF THE SURGEON GENERAL'S REPORT TO CONGRESS FOR 1934

It is interesting to note that for the calendar year 1933 the general death rate, 10.5 per 1000 population, was the lowest ever recorded in the United States, and the rate for 1932 was next lowest, 10.8 per 1000. While health conditions remained comparatively good for the first half of 1934, the death rates for many localities were higher than those for the preceding year.

In spite of the economic conditions, the number of deaths from tuberculosis continued to decrease. For the calendar year 1933 the death rate was 59 per 100,000 population—5 per cent below the previous low minimum. The typhoid fever death rate was also the lowest ever recorded—only 3.5 deaths per 100,000, which was 8 per cent below the previous minimum. The diphtheria rate dropped to 3.0 per 100,000—also the lowest death rate ever recorded by the Public Health Service for this disease.

Smallpox, the principal scourge of mankind in the last century, still caused more than 75,000 deaths in countries sufficiently advanced in health matters to keep vital statistics records, but less than 40 of these deaths occurred in the United States, although nearly 7000 cases of the disease were reported. Several European countries have advanced so far in preventive activities that they did not have a single case of smallpox in 1933.

The Public Health Service covers a broad field in its research activities in the cause and prevention of disease. Its principal laboratory is the National Institute of Health in Washington, but it also maintains field laboratories in various parts of the country. The subjects of research include, among others, cancer, encephalitis, heart disease, leprosy, malaria, psittacosis, Rocky Mountain spotted fever, tularemia, tick fever, child hygiene, dental conditions, industrial dermatoses and milk sanitation.

By means of animal experimentation, a new method was discovered for the treatment of bichloride poisoning in human cases. It was shown in actual cases that death from otherwise fatal doses of bichloride can be prevented when formaldehyde sulphonylate is given by mouth and injection into the vein within a reasonable time after the poison has been swallowed.

The Public Health Service was recently authorized by law to conduct two Narcotic Farms, i. e., hospitals for the treatment of Federal prisoners who are narcotic addicts, and to furnish medical and psychiatric care to prisoners in Federal penal and correctional institutions. The first of these Narcotic Farms is under construction at Lexington, Ky., and will be completed by April 1935. The other Farm is located at Fort Worth, Texas, and funds for beginning construction were made available through the Public Works Administration. At the close of the year the Public Health Service was operating 17 medical units in connection with the care of the inmates of Federal penal and correctional institutions.

In the field of public health, new problems constantly arise and new dangers appear, such as those illustrated by the unusual type of encephalitis appearing in St. Louis in 1933, the extensive outbreak of amoebic dysentery in Chicago, and the necessity for the control of distillery wastes which are now being emptied into already heavily overtaxed and polluted streams, thus seriously affecting the water supplies of the country. Constant vigilance is required for the early detection and study of these new continually arising dangers to the public health in order successfully to combat them.



A HOMER SMITH

JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

VOL XXIV

FEBRUARY, 1935

No 2

THE PRESIDENT OF THE AMERICAN DRUG MANUFACTURERS' ASSOCIATION

Alfred Homer Smith, reelected president of the American Drug Manufacturers' Association, 1934-1935, was born in Smyrna, Delaware, December 17, 1879, the son of Alfred Henry and Emily (Brown) Smith. After completing his studies in Smyrna high school, he engaged in a retail pharmacy and then matriculated at the Philadelphia College of Pharmacy and Science, graduating in 1902. Thereafter he was salesman for H. K. Mulford Company, then district manager and secretary and general sales manager of the corporation.

He received appointment as Lieutenant Colonel in the U. S. Army during the World War and served on the War Industries Board, Council on National Defense and National Advisory Council, Treasury Department, U. S. A.

From 1920-1922, Mr. Smith was secretary and member of the Board of Directors of E. R. Squibb & Sons and is now president of Sharp & Dohme.

Before his election to the presidency of the American Drug Manufacturers' Association, Mr. Smith served on a number of important committees, as secretary and first vice-president of the Association.

He is a member of the Board of Trustees of the Philadelphia College of Pharmacy and Science and holds membership in a number of organizations, among them, the Manufacturers, Bankers, Art, Philadelphia Country and Corinthian Yacht Clubs. He is a life member of the AMERICAN PHARMACEUTICAL ASSOCIATION.

February 3, 1908, Mr. Smith married Evelyn Hagen, of Lancaster, Pa. (b. Charlotte, N. C.), they reside in Alden Park, Germantown, Philadelphia, Pa.

EDITORIAL

E G EBERLE, EDITOR

2215 Constitution Ave., WASHINGTON, D C

FIRST AID WEEK

THE week of March 11th to 16th has been designated "First Aid Week," a purpose is to acquaint the public with the means for rendering first aid to injured and to those who suddenly become ill. Another purpose is to display preparations that may be employed in cases of injury and illness.

How far the pharmacist can go in rendering service when called upon to relieve the afflicted is a subject that should receive consideration, for selfish motives may bring about unfortunate results. There can be no objection to displays of first-aid articles but the rulings on the extent of medical advice by pharmacists are not uniform in all states. A leading Massachusetts case lays down the principle that "If a pharmacist sells medicine, receiving payment therefor, and gives advice gratuitously as to the use to be made of it, he is not holding himself out as a physician." The various licensure acts, however, are more and more tending to restrict the legal limits of such advice.

In 1928, the United States Public Health Service prepared an article, published in the JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION (page 699), which advises that every one become familiar with first-aid methods for treating the injured. "First aid has been defined as the temporary care of an injured person by simple, commonsense methods, based on principles of medicine and surgery, that may be applied easily by persons not professionally trained in these subjects." It should be noted that the work of first aid ceases when the injured person has been turned over to the care of a physician.

When it is recalled that more than 28,000 persons are killed in the United States by traffic accidents, over 13,000 by falls, more than 6000 by burns and drowning, over 27,000 by other accidental means and a greater number are more or less seriously injured and many are taken suddenly ill, the importance of first aid is realized and the effort to supply the needs under these conditions must be considered as a worthy service.

Every home needs first-aid means, and to belittle efforts as mercenary, because sales may bring financial returns, is not proper or right. The advice of this comment is directed to use First Aid Week for rendering service and to encourage study of the proper means and correct methods for application, so that commonsense advice can be given to those who need it. The displays should be planned to acquaint the public with the professional service of pharmacists and not bring into evidence items that are strictly merchandise. A week devoted to display of the lines indicated is deserving of encouragement, and it is hoped that all pharmacists will take an active part in this annual event.

THE NARCOTIC DRUG TRAFFIC

DURING recent months there have been quite a number of convictions for illegal sale of narcotics. At a meeting in Geneva of the Advisory Committee on Traffic in Drugs of the League of Nations, it was stated that although the steady flow of drugs from licensed factories into illicit traffic had much decreased, clandestine

tine factories were springing up and becoming a more abundant source of supply than the authorized factories had been. Study is being given to the organization of a specialized police force for the detection and closure of these factories and the development of an effective way of combating illicit traffic.

Jean Perrigault reported on the conditions in the Paris (France) press which were verified by the Commission. Production in some countries is kept to a high level and it is from the overflow that large amounts of the smuggled products reach the United States, *where earnest efforts are made to confine the supply of narcotics to lawful use*. There is lack of effort to control in sections of the Far East, the drug peddler is a menace, but countries that permit the manufacture of narcotics without proper restriction of their use are contributing a much greater harm. Smoking opium is being manufactured in excess of that being used under license and the surplus is a source of morphine and heroine for illegal purposes.

He who conducts his business on a dishonest basis must realize that it is only a question of time when he shall have to quit, and to the extent that there is dishonesty in business, to that extent is such business jeopardized. There is a selfishness in narcotic production more sordid than that which comes from the desire for gain, a selfishness which restrains the doing of service and lack of uplifting interest in the misfortune of the afflicted. Great and desirable as government may be, failure to use it in the interest of humanity adds to the responsibility of those to whom the power of government has been given. It is better to set human beings free than to enslave them, to extend aid than to oppress, to construct than to destroy, to give health than to make miserable, to lift up than to press down.

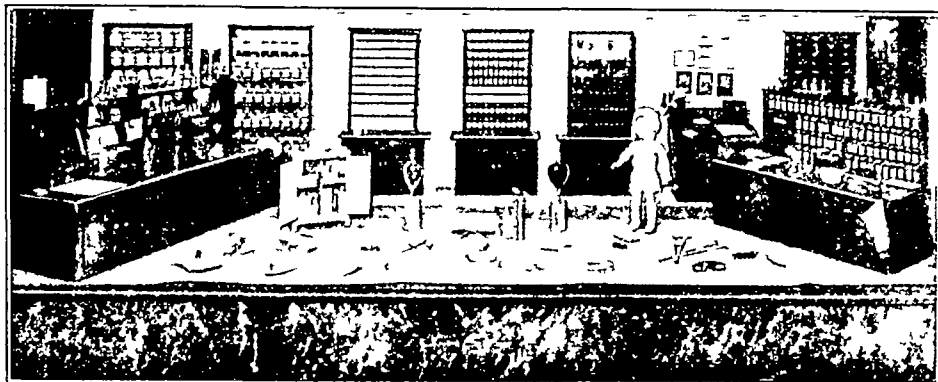
A SERVICE LIBRARY

THE library of the AMERICAN INSTITUTE OF PHARMACY is developing and members have an opportunity in aiding this service by the donation of books pertaining to pharmacy and allied sciences. The library has rendered service to divisions of the Government and departments have found desired information in its volumes, also individuals and schools. The mails frequently bring requests for information and it is gratifying that in most instances it has been possible to render service.

Modern libraries are provided with windows suitable for exhibits. A writer on the subject of window displays in the *Library Journal* states that these should be changed at regular intervals, they should deal with timely subjects, carefully planned—the changes based on a sequence or they may differ from preceding displays, the purpose of all of them is to interest the public.

The History of Science Society held its December meeting in the AMERICAN INSTITUTE OF PHARMACY and for this occasion several show-case displays were arranged of books dealing with the history of pharmacy which attracted the attention of the visitors and interested them. A related effort in display was made when the Round Table Medical Club held its January meeting in the building, a number of changes were made in the display and this was held over for the visit, on February 9th, of Phi Delta Chi delegates to the conclave in Baltimore, hailing from Massachusetts, New York, Nebraska, Maryland, Ohio, Iowa, Idaho, Kentucky, Colorado, North Carolina, Oklahoma, New Jersey and California.

The District of Columbia Retail Druggists' Association held its February session in the AMERICAN INSTITUTE OF PHARMACY. Comment is made on these events to impress the value of the library and to interest the visitors in increasing the number of books so that more extended library service may be rendered by the AMERICAN PHARMACEUTICAL ASSOCIATION. Numbers of volumes may not have great significance without coordinated selection in order to meet the requirements of pharmacists. The divisions of the AMERICAN INSTITUTE OF PHARMACY, it is hoped, will become service features of the ASSOCIATION.



PRIZE-WINNING PHARMACY WEEK WINDOW

Apothecaries Hall, established more than a century ago in New Haven, Conn., was voted the Pharmacy Week prize for 1934. The pharmacy is managed by S. G. Gessner, son of a life time member of the AMERICAN PHARMACEUTICAL ASSOCIATION, Emil A. Gessner (for sketch see page 1071, JOURNAL A. P. H. A., 1928). The latter died February 3, 1930, aged 80 years.

In 1934, a brief history of Apothecaries Hall was published in connection with the celebration of the 150th anniversary of New Haven County Medical Association and the 113th anniversary of Apothecaries Hall.

The prize-winning window display showed a miniature prescription room, equipped with fixtures, shelf bottles, utensils, show globes and sick room supplies. The cabinets are 29 inches high and 14 inches wide, the laboratory table is equipped and is 14 inches deep, 38 inches wide and 10 inches high, the refrigerator is 12 inches high and in front of it are samples of biologicals. On the prescription counter are preparations in process of compounding.

The store has an interesting collection of antique pharmaceutical equipment and Mr. Gessner uses some of them in displays. We congratulate the prize winner and the many who entered into the contest and thereby gave publicity to professional pharmacy.

The following were selected for the ten prize winning ribbons donated by the National Association of Retail Druggists, in the order named: Publix Drug Company, Philadelphia, Pa.; John E. O'Brien, Omaha, Neb.; Frank Nau, Portland, Ore.; Terrant Drug Company, Birmingham, Ala.; F. S. Johnston Drug Co., Parsons, W. Va.; Carl J. Heinrich, Superior, Wis.; Morgan & Mullard, Baltimore, Md.; John A. Klingstedt, Rockford, Ill.; L. L. Eisentraut, Iowa; H. W. Reuter, St. Louis, Mo.

The following received honorable mention: Freund Pharmacy, Indianapolis, Ind.; Peoples Drug Store, Wilmington, Del.; Finley's New Store, Greenville, Miss.; Dr. Peters' Drug Store, Schulenburg, Tex.; Ballou Latimer Drug Co., Boise, Idaho; Hoagland's Drug Store, New Brunswick, N. J.; Ace Drug Co., San Diego, Cal.; R. J. Allen Drug Co., Sioux City, Iowa; Nathan A. Mazer, Denver, Colo.; Funk's Pharmacy, Cleveland, Ohio.

Members of National Pharmacy Week Window Display Contest Committee: *Chairman*, John F. McCloskey, E. A. Kimzey, J. Culver, P. Grossman, A. Worner.

SCIENTIFIC SECTION

BOARD OF REVIEW OF PAPERS — *Chairman*, F E Bibbins, George D Beal, L W Rising, H M Burlage, L W Rowe, John C Krantz, Jr, Heber W Youngken

A STUDY OF CALOMEL FROM THE PHYSICAL AND THE CHEMICAL STANDPOINT *

BY CHARLES H IAWALL AND JOSEPH W E HARRISSON

The two chlorides of mercury have had a long and interesting history. The mercuric chloride dates from the Arabian period under Geber in the 9th century, while the mercurous chloride seems to have first appeared in the 16th century and is described in the works of Beguin and Crollius, under the name of "dulcified mercury."

It has appeared in more physical forms and under a greater diversity of Latin and common names than any other official chemical salt.

It has appeared in every edition of the United States Pharmacopœia.

In the U S P of 1820 directions were given for the preparation of calomel from "oxy muriate of mercury" (corrosive sublimate) and purified mercury, which was three times sublimed and then levigated and elutriated.

In 1830 the process was changed in that mercuric sulphate was first prepared from mercury and sulphuric acid, and this was then mixed with salt and sublimed and the sublimate subsequently purified with solution of ammonium chloride and boiling water and finally levigated and elutriated.

In 1840 the same process was directed as in 1830 with the addition of a test to exclude soluble chlorides.

No further change was made until 1880 when the formula was discontinued and identity tests were added as well as tests for absence of mercuric chloride.

It was not until 1910 that an assay method was introduced. It was in the 1890 Pharmacopœia that a descriptive requirement was introduced which has remained essentially unchanged for four decades and which reads as follows:

'A white impalpable powder becoming yellowish white on being triturated with strong pressure, and showing only small isolated crystals under a magnifying power of 100 diameters.'

This requirement probably originated in the fact that in European pharmacy two calomels had been recognized, one for sublimed calomel (which was described as distinctly crystalline) and the other for calomel prepared with steam, which was described (as in the paragraph quoted above) as showing under the same magnification (100 diameters) only a few isolated crystals. This same requirement occurs in the 6th edition of the German Pharmacopœia (1926) and in the 4th edition of the Belgian Pharmacopœia (1930).

The reason for this investigation is a rather curious and unusual one.

A private client came to us with the statement that he had suffered from a non-specific urethritis which had been caused by the irritating effect of a prophylactic ointment which had been injected into the urethra.

* Scientific Section, A P H A, Washington meeting, 1934

Investigation of this ointment showed the presence of a large number of sharp pointed acicular crystals of calomel and as none of the calomels which were easily accessible showed a microscopic appearance, anything like the specimen in question, it was decided to make a complete study of the calomels made by different manufacturers both in America and in Europe

The American calomels were obtained by corresponding with the respective manufacturers, while the European calomels were obtained through the kind assistance of Dr. Joseph Rosin, of Merck and Company. In this investigation we have examined sixteen specimens of at least seven different origins, as follows

American manufacturer	A	2 specimens
American manufacturer	B	6 specimens
American manufacturer	C	1 specimen
German manufacturer	A	3 specimens
French manufacturer	A	1 specimen
French manufacturer	B	1 specimen
English	A	1 specimen
Of unknown origin		1 specimen

For many years there have been three different types of calomel described in the literature, differentiated by their methods of manufacture and their titles, and by specific recognition in some of the European pharmacopœias

These different types are discussed at some length in "Hager's Handbuch der Pharmaceutischen Praxis," the following abstracts being taken from the 5th edition of that famous work, published in Berlin in 1907, where photographs are shown of their comparative appearance when examined under the microscope

They are distinguished by the following Latin titles

- A *Hydrargyrum chloratum præparatum*
- B *Hydrargyrum chloratum vapore paratum*
- C *Hydrargyrum chloratum præcipitatum*

Type A is made by subliming a mixture of mercuric chloride and metallic mercury

This type is first produced in white, glistening masses of crystalline texture, the product being subsequently reduced to a fine powder by levigation and purified with water in unglazed porcelain mortars or in ball mills

It occurs as a fine, impalpable, yellowish white, dustless powder, which has a tendency to agglutinate and which under microscopic examination is found to consist of broken crystal fragments which are larger in size than those observed in other types

Type B is made by permitting calomel vapor (obtained by a reaction similar to that described above or by starting with the crude product made as above, before levigation) to come in contact with steam or cold air in a closed vessel or chamber. Under these conditions the calomel condenses in the form of small crystals and crystal aggregates. It is not always necessary to levigate this variety but it is sometimes done

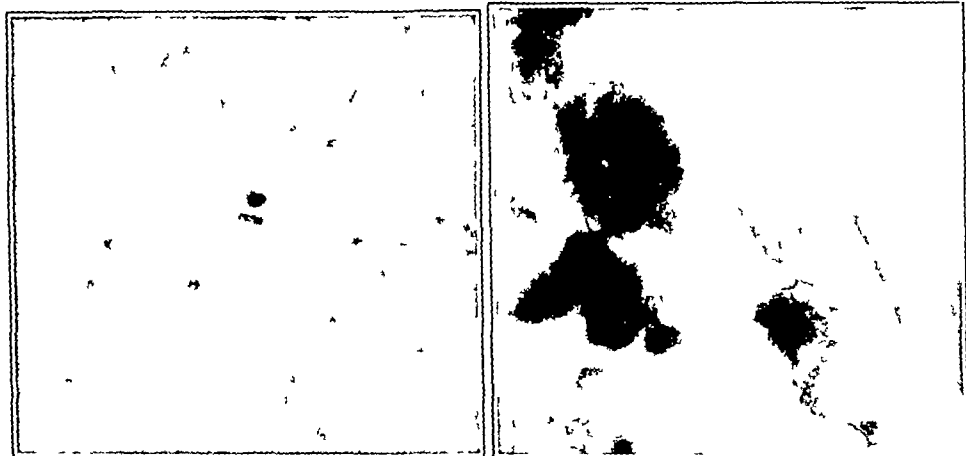
It occurs as a dusty powder which does not show a tendency to cohere when pressed between the fingers. Under the microscope it shows translucent prismatic crystals of a great variety of sizes and shapes and of which the individual particles are smaller than in A

Type C is made by precipitation. There is a choice of a number of methods of which the two following are typical. In one method a dilute solution (1 in 30) of mercuric chloride is saturated with purified sulphur dioxide. After several hours standing to complete the reduction and precipitation, the precipitate is collected, washed and dried. In another method mercurous nitrate solution is precipitated with a diluted hydrochloric acid and the precipitate subsequently collected, washed and dried.

Precipitated calomel is a heavy, fine, amorphous, white powder, greasy to the touch and very adherent to the fingers. It is the finest of all of the types in the size of the particles when subjected to microscopic examination.

All three of these types are light sensitive in the presence of moisture and must be dried and handled in the dark before finally packaging for the market.

Types A and C have the property of agglutinating and both varieties are unsuitable for dusting purposes.



Calomel specimen No 1 (Specimens Nos 4, 10, 12 and 15 were of similar appearance)

Calomel specimen No 2 (Specimens Nos 3 and 14 were of similar appearance, No 14, however, contained more acicular crystals)

Type B does not agglutinate and is suitable for dusting, and according to Hager is the variety to be dispensed when "calomel" is ordered.

Type A is known by the following Latin names

Hydrargyri subchloridum

Hydrargyrum chloratum

Hydrargyrum chloratum mite

Hydrargyrum chloratum mite sublimatum paratum

Hydrargyrum chloratum mite praeeparatum seu levigatum

Type B is known by the following Latin names

Hydrargyri chloridum mite

Hydrargyrum chloratum vapore paratum

Calomel vapore paratum

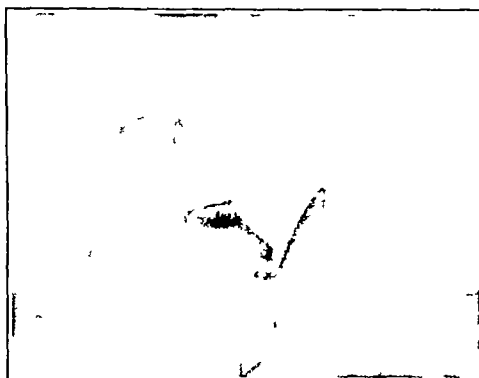
Type C is known by the following Latin names

Hydrargyrum chloratum via humida paratum

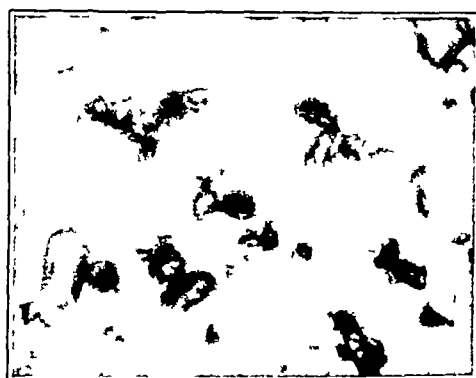
Hydrargyrum chloratum mite praecipitatione paratum

The specimens were labeled as follows (omitting the name of the manufacturer)¹

1, Calomel, U S P special, finely powdered, 2, Calomel, mercurous chloride, C P, 3, Calomel, U S P, mercurous chloride, 4, Calomel, U S P X special, fine powder, 5, Calomel, mild mercurous chloride, U S P, 6, Calomel, reagent, 7, Calomel, mild mercurous chloride, U S P X, 8, Hydrarg chlor mite, sublimatum, 9, Hydrarg chlor mite, vapore paratum, 10, Hydrarg chlor mite, precip, *via* humida paratum, 11, Protochlorure demercure, calomel a la vapeur, 12 Protochlorure de mercure, pricipite blanc, 13, Calomel, 14, Calomel, 15, Calomel, U S P special fine powder, 16, Calomel, sublimed, not powdered



Calomel specimen from ointment (a)



Calomel specimen No 5 (Specimens Nos 8 9 11, 13 and 16 were of similar appearance)

TABULATION OF RESULTS OF EXAMINATION OF CALOMEL SPECIMENS, APPLYING U S P TESTS

No		Assay %	Other U S P Tests
1	American manufacturer A	99 96	O K.
2	American manufacturer B	99 67	O K.
3	American manufacturer C	99 51	O K
4	American manufacturer B	99 95	O K
5	American manufacturer A	100 09	O K
6	American manufacturer B	99 91	O K
7	American manufacturer B	100 05	O K
8	German manufacturer A	99 42	O K
9	German manufacturer A	99 39	O K
10	German manufacturer A	99 69	O K
11	French manufacturer A	98 93	O K
12	French manufacturer B	99 13	O K except 0.15% residue on heating
13	English manufacturer	98 78	O K
14	American manufacturer (identity unknown)	99 13	O K
15	American manufacturer (identity unknown)	100 06	O K
16	American manufacturer (unpowdered)	100 36	O K

A small portion of the calomel was mixed on a microscope slide with a 60% aqueous solution of glycerin

An examination was first made with a 10 X eyepiece and a 4-mm objective, referred to as "low power" Further examination was then made with a 20 X eye-

¹ Five illustrations of photomicrographs of Calomel specimens are shown

NOTE The word "number" is omitted preceding specimen

piece and a 4-mm objective, referred to as "high power" The measurements were made with a stage micrometer under 8-mm objective with a 20 X eyepiece

No 1—American manufacturer A Under low power this specimen appeared crystalline but on examination under high power the particles are seen to be round or oval and do not show a crystalline structure The largest particles are less than $0.1\ \mu$ in length

No 2—About half the total number of particles are clear columnar crystals about $2\ \mu$ in length with the width from one fourth to one eighth of the length There are a few slender acicular crystals About half the number of particles are rosettes and crystal aggregates ranging in diameter from 0.5 to $1.5\ \mu$

No 3—This specimen is very similar in appearance to No 2 except that some of the rosettes are $2\ \mu$ in diameter

No 4—This specimen is very similar in appearance to No 1

No 5—This specimen shows more crystal fragments than rosette aggregates, although they are not acicular

The crystal fragments range in size from $0.25\ \mu$ to $1\ \mu$ and a few even as large as $2\ \mu$ The rosettes average from 0.5 to $1\ \mu$ in diameter

No 6—This specimen is composed almost entirely of rosettes ranging in size from 0.5 to $2\ \mu$ in diameter There is an occasional sharp pointed columnar crystal about $3\ \mu$ in length

No 7—This specimen is almost identical with No 6 except that the range in size of the rosettes seems to be slightly greater the smaller being $0.25\ \mu$ and the larger $3\ \mu$

No 8—This specimen is composed of fairly round rosettes mostly uniform in size, a few as small as $0.25\ \mu$ in diameter and a few as large as $1\ \mu$ The separate crystals are very few in number

No 9—This specimen consists entirely of small rosettes and crystal aggregates mostly ranging from 0.25 to $0.5\ \mu$ in diameter a few reaching $1\ \mu$ in size There are no acicular crystals in this specimen

No 10—This specimen consists almost entirely of very small blunt cylinders of uniform diameter which show no evident crystalline character under any magnification The length of these particles is about $0.1\ \mu$ and the diameter is about one-fourth of the length

No 11—This specimen is composed mainly of rosettes and crystal aggregates ranging from 0.25 to $1\ \mu$ in diameter There are a few separate columnar or prismatic crystals, some more than $2\ \mu$ in length, and a number of smaller particles, probably broken fragments of these columnar crystals

No 12—This consists of many small irregular-shaped particles ranging from $0.2\ \mu$ down to $0.05\ \mu$ in size The layer particles may be aggregates of the smaller ones There are very few columnar or prismatic crystals

No 13—This specimen is composed entirely of rosettes and crystal aggregates, averaging from $0.25\ \mu$ to $0.75\ \mu$ with a few as large as $1\ \mu$

No 14—This specimen which is of unknown origin, contains the largest proportions of acicular or columnar crystals of any specimen examined

The acicular crystals range from 0.5 to $2.5\ \mu$ in length, the width being from $\frac{1}{8}$ to $\frac{1}{4}$ the length

The rosette aggregates which constitute the remainder of the specimen are rather uniform in size, averaging $0.75\ \mu$ in diameter

No 15—This specimen consists of small particles mostly cylindrical or rod shaped, some few of which show a crystalline structure The largest rod-shaped particles are about $0.2\ \mu$ in length, but there are many particles less than $0.1\ \mu$ in diameter



Calomel specimen No 6 (Specimen No 7 was of similar appearance)

No 16 —This specimen shows a variety of forms of particles There are some isolated crystals (not acicular), a few rosettes a number of crystalline aggregates and some very small particles The range in size is from 0.05 to 0.1 μ

No 17 —(a) and (b) is a specimen of the calomel extracted from the ointment which led to the investigation

In these specimens large and pointed crystals, some of which appear to have been eroded, are in evidence

None of the commercial calomels are identical with this specimen in appearance, and it is possible that some alteration in the physical condition of the crystals in the ointment sample may have resulted as a consequence of the action of the fat of the ointment base on the calomel after the ointment was prepared

The results of the survey are interesting as showing the high quality to which the specimens conformed and also as illustrating the wide variance in size and type of particles as shown by the photomicrograph illustrations, all of which are on the same basis of magnification

THE ASSAY OF CITRINE OINTMENT *

AN EXPERIMENTAL STUDY ¹

BY THOMAS G. WRIGHT

INTRODUCTION

The Citrine Ointment of to day is an ointment which is essentially a mixture of mercuric nitrate with a fatty base formed by the action of nitric acid upon lard An ointment by this name first appeared in the London Pharmacopœia of 1650 and since that date there has been a wide difference of opinion as to its composition, stability and assay The original preparation was a mixture of coral, limpet shells, white marble, white lead, quartz and tragacanth, incorporated with a base of hogs' lard, suet and hens' grease, but contained no mercury

Nitrate of Mercury Ointment approximating in composition the present Citrine Ointment, first appeared in the Edinburgh Pharmacopœia of 1722 and was introduced, according to Christison's Dispensatory, as a substitute for a then popular proprietary remedy, 'Golden Eye Ointment,' an ointment of yellow oxide of mercury It was not until 1746 that a similar ointment was admitted to the London Pharmacopœia A milder ointment, one made with twice the quantity of lard was made official in the Edinburgh Pharmacopœia of 1792 An ointment composed of mercury, nitric acid, lard and olive oil was included in the Dublin Pharmacopœia of 1807 This ointment was admitted to the British Pharmacopœia of 1864, and one of similar composition was admitted to the French Pharmacopœia at a later date In this country, the ointment received official recognition as early as 1820, when it appeared in the Pharmacopœia of the United States under the title of Unguentum Hydrargyri Nitratis It was readmitted at each succeeding revision of the Pharmacopœia until that of 1920 when it was dropped Its official status, however, was not changed as it was immediately given a place in the National Formulary

From the date of its introduction into the Edinburgh Pharmacopœia to the present time, many different formulas have been suggested for the preparation of the ointment, the principal objectives being to simplify the preparation of the elaidin base and to improve the keeping qualities of the ointment This phase of the subject in so far as it pertains to the work reported in this paper, will be discussed in detail under the composition of the ointment

* Scientific Section, A. P. H. A., Washington meeting, 1935

¹ From the laboratory of A. G. DuMez, Professor of Pharmacy School of Pharmacy of the University of Maryland Compiled from a thesis submitted to the Faculty of the Graduate School of the University of Maryland in partial fulfillment of the requirements for the degree of Master of Science

Considerable literature is available dealing with the preparation and stability of the ointment (1), some work on the composition of the ointment has been reported, but little has been published regarding its assay. Work along this line is therefore needed and particularly at this time when the National Formulary is being revised. It was primarily for this reason that the study reported in this paper was undertaken.

COMPOSITION OF THE OINTMENT

Before undertaking an analysis of any kind it is desirable that as much information as possible be obtained on the composition of the material to be analyzed. This is particularly true in the case of Citrine Ointment. While the component of importance, from a pharmaceutical standpoint, in this instance is mercury, the analytical method selected for the quantitative determination of the mercury will depend largely upon the form in which the latter occurs in the ointment.

As stated in the introduction, the composition of the ointment has been the subject of study by several investigators (2), and while the results obtained by them, particularly those obtained by the early investigators, were not in complete accord, the following general conclusions may be drawn. The ointment is essentially a homogeneous mixture of mercuric nitrate solution with a fatty base called elaidin. It is quite probable that it contains some basic oxides of mercury in addition to the normal nitrate and that a portion of the mercury is also present as mercuric elaidate, resulting from the interaction of elaidin with mercuric nitrate.

Citrine Ointment is prepared by first dissolving metallic mercury in a strong solution of nitric acid, a violent reaction occurring between these two substances with the formation of mercuric nitrate, as the chief product and probably some other compounds of nitrogen of little importance in this connection. Some investigators have expressed the view that this solution is a mixture of many chemical compounds. J. Laidley (3) believed the solution to be a mixture of mercurous and mercuric nitrates, while A. Astruc (4) considered the solution to be composed of mercuric nitrate, mercurous nitrate, nitrogen peroxide, nitrogen dioxide and free nitric acid.

The second step in the preparation of the ointment is that of preparing the base. The latter is the product resulting from the reaction occurring when nitric acid is added to lard. Lard is chiefly a mixture of the glyceryl esters of stearic, palmitic and oleic acids, the glyceryl ester of oleic acid predominating. When nitric acid is added to this mixture, it is reduced to nitrous acid and this in turn reacts with the oleic acid ester to form the isomer, elaidin, which is the ointment base. Some investigators have contended that the yellow color of the ointment is due to elaidin. H. C. Cook (5) held this view. Astruc and M. Donovan (6) on the other hand, reported the color to be due to basic mercuric nitrate, Hg_2OHNO_3 , arising from the action of nitrogen dioxide on mercuric nitrate. A. Baumé (7) claimed that a "soap" having no yellow color is formed when nitric acid reacts with fat and that precipitation of mercury in the ointment is the cause for the color formation. The explanation of Baumé is now known to be fallacious since the fat turns yellow before the mercury solution is added, and is due to the action of the nitric acid alone.

The final step in the preparation of the ointment is that of incorporating the mercury with the base. This is accomplished by dissolving the required amount of mercury in nitric acid and stirring the solution into the fat. At this point in

the preparation of the ointment, most investigators believe that a series of reactions takes place with the formation of compounds in which mercury is organically combined. This belief is probably well founded, and the compounds of mercury most likely to be formed are the salts of the fatty acids liberated in the partial hydrolysis of the glyceryl esters. The ointment, therefore, probably contains some mercuric oleate, palmitate and stearate. Elaidate of mercury should also be present for the same reason.

ASSAY METHODS

Chemical assay methods, especially those designed for the determination of pharmaceutical preparations, should be methods that are practical from the standpoint of material and apparatus used, ease of carrying out the procedure, and time consumed, but should, nevertheless, be sufficiently accurate to give results which may be depended upon arriving at a fair evaluation of the substance assayed, even though other substances of a similar nature may be present.

The assay methods for ointments containing mercury compounds, reported in the literature, were reviewed to determine if they could be adapted to the assay of Citrine Ointment. In the main, these methods consisted of the decomposition of the ointment with acid and subsequent titration of the remaining mercury solution. Most of these were rejected without experimental trial because of their complexity and because the time required to complete the assays was too great to permit of their use in practice. The procedure of I. V. S. Stanislaus and E. A. Eaton for the assay of Citrine Ointment (8) was reviewed. The method consists of treating the ointment with a solution of potassium hydroxide, allowing the mixture to stand for 24 to 48 hours for complete subsidence of the mercury oxides, precipitation of the mercury as sulphides, addition of iodine solution, and subsequent titration with sodium thiosulphate solution. Although this method seemed to be satisfactory from a theoretical standpoint, it was deemed to be unsatisfactory because of the length of time required to carry it out, and was, therefore, not given an experimental trial. The method of Strickland (9) in which the ointment is decomposed by nitric acid and the remaining mercury solution titrated with potassium thiocyanate, seemed to meet most of the requirements of a good assay process. It was, therefore, used as a basis for beginning the work reported in this paper.

EXPERIMENTAL PART

For the purpose of providing material for assay, the mercury content of which was known, it was necessary to prepare a batch of ointment using mercury of known purity. A quantity of the ointment was therefore prepared according to the directions given in the National Formulary. V. nitric acid (sp. gr. 1.42) was used and the fat was the best grade of lard obtainable. The lard was melted in a large porcelain evaporating dish at a temperature not exceeding 45° C. The nitric acid was added and the mixture was heated until the reaction between the lard and acid was complete and all of the olein was converted into the isomer elaidin. The specified quantity of mercury was then dissolved in nitric acid without the aid of heat and added to the elaidin base, which had been allowed to cool. The resulting product was stirred continuously with a glass rod until a uniform mixture of the consistence of an ointment was obtained. The ointment, when cool, was transferred to an amber colored glass jar, which was covered tightly with a ground glass cover. No contact was made, at any point in the procedure, with metallic utensils.

The mercury used in the preparation of the ointment was assayed for purity by the method of the United States Pharmacopœia X. Twelve determinations were carried out, the results of which are given in the following table.

TABLE I—ASSAY OF METALLIC MERCURY BY U S P X METHOD

Sample* No	1	2	3	4	5	6
Hg found in %	99.29	99.04	99.74	98.75	99.82	99.91
Sample* No	7	8	9	10	11	12
Hg found in %	99.85	99.98	99.93	99.96	99.95	99.90

* Description of Sample The mercury used in all of the above assays was obtained from Merck & Co., and labeled triple distilled

The potassium thiocyanate solution used in the foregoing determinations and in all other assays, was prepared according to the directions of the United States Pharmacopœia X and was regularly standardized at intervals of about seven days against a *N*/10 solution of silver nitrate which was kept in a ground glass stoppered bottle painted black, to prevent any deterioration which might be caused by the action of sunlight

TABLE II—DETERMINATION OF MERCURY LOST IN PREPARATION OF CITRINE OINTMENT

Sample No	Wt. of Hg Taken	Diluted to Cc	Aliquot Taken Cc	Cc KCNS	Equiv. KCNS Hg	Wt. of Hg in Sample	% of Theory
1A	3.5124	100	10	30.4	0.01003	3.4941	99.48
B	3.5124	100	10	30.4	0.01003	3.4941	99.48
C	3.5124	100	10	30.4	0.01003	3.4941	99.48
D	3.5124	100	10	30.4	0.01003	3.4941	99.48
2A	37.0703	1000	10	32.1	0.01003	36.8957	99.52
B	37.0703	1000	10	32.1	0.01003	36.8957	99.52
C	37.0703	1000	10	32.1	0.01003	36.8957	99.52
D	37.0703	1000	10	32.1	0.01003	36.8957	99.52
3A	69.3710	2000	10	30.0	0.01003	68.9640	99.41
B	69.3710	2000	10	30.0	0.01003	68.9640	99.41
C	69.3710	2000	10	30.0	0.01003	68.9640	99.41
D	69.3710	2000	10	30.0	0.01003	68.9640	99.41

Summary Sample No 1 (0.52% Hg lost)
 Sample No 2 (0.48% Hg lost)
 Sample No 3 (0.59% Hg lost)

During the preparation of the ointment the reaction between the mercury and nitric acid becomes violent, with the evolution of considerable heat. Since mercury is a volatile substance, it was believed that there might be an appreciable loss, due to the heat thus generated, and that this condition was responsible for the low results obtained in the assay of the ointment by the different methods in use. To determine the accuracy of this belief three batches of mercuric nitrate solution were made using the approximate quantities of mercury and nitric acid necessary to prepare 50, 500 and 1000 Gm. of Citrine Ointment. The temperature seemed to increase directly with the size of the quantities of reacting materials used, hence the preparation of the three batches of solution in the quantities stated. The mercury required was accurately weighed and dissolved in the nitric acid which was also weighed. No external heat was applied in these cases. The solutions were titrated with *N*/10 potassium thiocyanate solution in the usual manner, the results compared with the weight of mercury used and the percentage loss of mercury computed. However, the loss in mercury, if any, was not over 0.59 per cent in any case and this loss was constant irrespective of the quantity of solution prepared as shown by the results presented in the foregoing table.

As previously stated, the method of Strickland (9) seemed to meet most of the requirements for a good assay process, and the analysis of the ointment by this method was therefore taken up. This method, as published, was originally intended for the assay of Mercurial Ointment, of the United States Pharmacopœia, but, according to the originator, it would also serve for the assay of Citrine Ointment.

About 10 Gm of the ointment, accurately weighed, was heated under a reflux condenser with 100 cc of nitric acid and the heating continued until all of the mercury had been dissolved and the fatty base completely broken down. The resulting solution was filtered through cotton into a 200-cc graduated flask and a 3 per cent potassium permanganate solution was added until a permanent pink color was obtained. The solution was then decolorized with 3 per cent ferrous sulphate solution and the volume accurately made up to 200 cc with distilled water. An aliquot of this solution was titrated with *N*/10 potassium thiocyanate solution. One cc of potassium thiocyanate solution is equivalent to 0.01003 Gm of mercury.

The method as outlined in the foregoing was subjected to test in the laboratory and was found to be unsatisfactory as the results obtained with it were low and variable, as shown in Table III.

TABLE III — ASSAY OF CITRINE OINTMENT BY STRICKLAND'S METHOD

Sample No	1	2	3	4	5	6	7
Hg found in %	4.93	5.37	2.41	4.21	6.79	4.97	2.79
Hg theoretical in %*	6.97	6.97	6.97	6.97	6.97	6.97	6.97

* The theoretical percentage of mercury present was computed from the quantity of triple distilled mercury used in the preparation of the ointment, and which assayed 99.67 per cent pure metallic mercury by the U. S. P. X method.

Many hours of refluxing were required to completely break down the organic matter present in the ointment, and volatilization, due to this continued heating, was probably the chief cause of the loss of mercury.

The addition of potassium permanganate solution also gave some difficulty as a large volume of the permanganate solution was often required to bring about the permanent pink coloration.

Various other methods of analysis were tested but the results obtained were the same as those of the above procedure in every case.

Due to the low results obtained it was believed that some of the organic compounds were not completely broken up and that the resulting solution did not, therefore, contain all of the mercury. A stronger oxidizing agent was thought to be essential for complete decomposition of these compounds. The oxidizing mixture selected for trial consisted of perchloric acid (sp. gr., 1.615), 1 part, fuming nitric acid (sp. gr., 1.49), 2 parts, and distilled water, 2 parts. This combination proved to be a more efficient oxidizing mixture than nitric acid or a mixture of nitric and sulphuric acids, and was satisfactory in other respects. A method of assay based on the use of this oxidizing mixture has therefore, developed. A description of the method follows.

Place about 5 Gm of the ointment, accurately weighed, in a flask containing 50 cc of the above acid mixture and reflux until a clear solution is obtained and the brown fumes are no longer distinguishable. Dilute the solution with about 20 cc of distilled water, and pass it through a filter paper into a 100-cc volumetric flask. Wash the funnel with sufficient distilled water to bring the volume up to 100 cc. Take a 20-cc aliquot of this solution and titrate it with *N*/10 potassium thiocyanate solution, using ferric alum as the indicator, until a permanent reddish brown color is obtained. The condenser and flask used should be fitted with ground glass connections in order to avoid contamination and error which might occur from the action of the acid mixture upon either cork or rubber stoppers.

In the first trials, the assay was carried out by refluxing on a water bath and although the results obtained were all within a close range of the theoretical amount of mercury in the ointment and did not show a great variation, the time necessary for refluxing was about three and one-half hours. The results of these determinations are shown in Table IV.

TABLE IV—ASSAY OF CITRINE OINTMENT BY PERCHLORIC-NITRIC ACID METHOD HEAT FURNISHED BY WATER BATH

Sample No	1	2	3	4	5	6	7	8
Hg found in %	8.60	8.57	8.10	8.34	8.61	8.24	8.11	8.38
Hg theoretical in %	8.67	8.67	8.67	8.67	8.67	8.67	8.67	8.67

In order to reduce the time factor of the assay the water bath was eliminated and the ointment was refluxed over a low open flame. With this modification of the procedure, it was found that one hour was sufficient time to decolorize the solution in every case. Two batches of the ointment were prepared and were labeled, "batch A" and "batch B." Seven assays in which this procedure was followed were run on "batch A" and ten determinations were made with "batch B." The results obtained were not only constant but as nearly accurate as can be expected of a method of this type.

TABLE V—ASSAY OF CITRINE OINTMENT BY PERCHLORIC-NITRIC ACID METHOD, "BATCH A" HEATED OVER OPEN FLAME

Sample No	1	2	3	4	5	6	7
Hg found in %	8.51	8.45	8.65	8.58	8.63	8.63	8.64
Hg theoretical in %	8.67	8.67	8.67	8.67	8.67	8.67	8.67

TABLE VI—ASSAY OF CITRINE OINTMENT BY PERCHLORIC-NITRIC ACID METHOD, "BATCH B" HEATED OVER OPEN FLAME

Sample No	1	2	3	4	5
Hg found in %	8.39	8.20	8.37	8.43	8.38
Hg theoretical in %	8.44	8.44	8.44	8.44	8.44
Sample No	6	7	8	9	10
Hg found in %	8.34	8.34	8.34	8.33	8.29
Hg theoretical in %	8.44	8.44	8.44	8.44	8.44

CONCLUSIONS

From the results obtained in the experiments described above, the following conclusions are drawn:

- 1 Citrine Ointment is a homogeneous mixture consisting of mercuric nitrate and other mercury compounds which are uniformly distributed.

- 2 Most assay methods heretofore published are impractical for the determination of the mercury in this ointment because they are too complicated, too lengthy, and because they do not give constant results in the hands of different analysts.

- 3 Only a very slight amount of the mercury used is lost in the preparation of the ointment.

- 4 Citrine Ointment can be accurately assayed by the method proposed.

- 5 The method proposed is simple, rapid and practical.

REFERENCES

- (1) Duhamel A, *Am J Pharm*, 13, 101 (1842), Laidley, J, *Ibid* 22 119 (1850), Mercein, J R, *Ibid*, 30, 103 (1858), Creecy, W P, *Ibid*, 32, 212 (1860), Schweitzer, J, *Ibid*, 32, 272 (1860), Lester, J S, *Ibid*, 34, 394 (1862), Falieres, M, *Ibid*, 45, 460 (1873), Gingrich J A, *Ibid*, 49, 551 (1877), Humbrich, W B, *Ibid*, 51, 438 (1879), Starck, A A G, *Ibid* 51, 437 (1879) Fairthorne, R F, *Ibid* 52 299 (1880), Reichard, C W, *Ibid*, 55, 438 (1883), Cook, H C, *Proc A Ph A*, 34, 309 (1886), LaWall, C H, *Am J Pharm*, 46, 525 (1894), Squire, T W, *Pharm J*, 172 (1897), England, J W, *Am J Pharm* 69, 209 (1897), Snavely, C O, *Proc Penna Pharm Assoc*, 167 (1904), through *YEAR BOOK A Ph A* 53, 602 (1905), Duncan, W, *Pharm J*, 119, 694 (1927)
- (2) Astrug A, "Pharmacie Galenique" 2 1101, Cowley, R C, *Chem and Drug*, 896 (1908) Donovan M, *Pharm J*, 6, 648 (1865), through *Am J Pharm*, 37, 296 (1865)
- (3) Laidley, J, *Am J Pharm* 22, 119 (1850)
- (4) Astrug, A, 'Pharmacie Galenique' 2, 1101
- (5) Cook H C, *Proc A Ph A* 34 309 (1886)
- (6) Donovan M *Am J Pharm*, 37, 296 (1865)
- (7) Baume, A, 'Elements de Pharmacie,' 2 626
- (8) Stanislaus, I V S, and Eaton, E A, *Proc A Ph A* 59, 115 (1911)
- (9) Strickland, *Trans Brit Pharm Conf* 179 (1916)

THE PHARMACOLOGY OF GALINSOGA *¹

A SERIES OF MICRO-RESPIROMETER STUDIES

BY MARTIN A YAVORSKY WITH EDWARD C REIF ²

Preliminary experiments on the pharmacology of Galinsoga (1) indicate the presence of a principle or principles in the plant, which cause a drop in the blood pressure of the dog when certain preparations are injected intravenously

The chemistry of the plant has been studied by Dr Karl Muller (2) No reference, however, has been made to the presence of a potent or active constituent

The purpose of this paper is to describe certain experiments that were conducted to increase our knowledge of the pharmacology of Galinsoga and to add more information concerning the oxygen consumption by tissues, especially the influence upon the same by plant drugs

It is a well-known fact that tissues removed from the body of a recently killed animal will, if suspended in a suitable medium, utilize oxygen for an indefinite period. Oxidations in animal tissues can be studied by means of a micro respirometer, various types of which are described by Warburg and his collaborators (3)

Extensive studies on the influence of certain compounds on the oxygen consumption of many tissues have been made by Voegtlin, Rosenthal and Johnson (4), (5)

The action of Vitamin C on the oxidations of tissue *in vitro* has been reported by Harrison (6)

Oxygen consumption by the tissues used in this series of experiments was

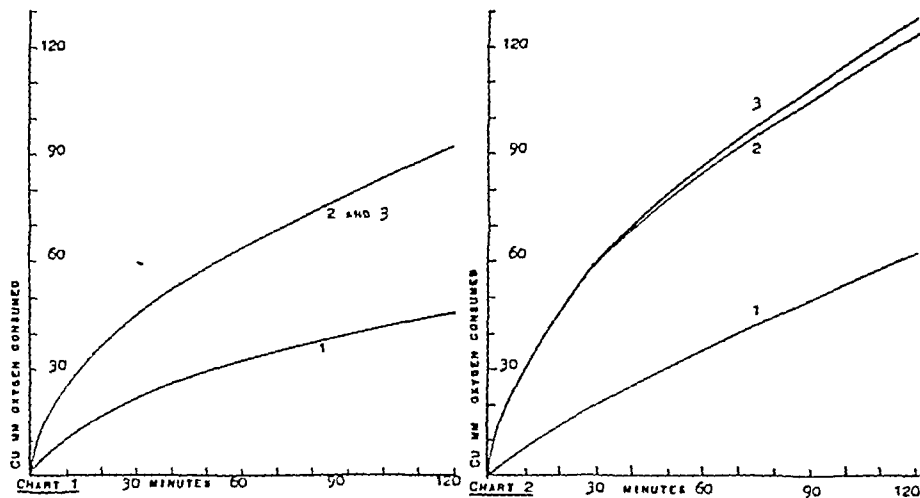
* Scientific Section, A Ph A Washington meeting, 1935

¹ Submitted as partial requirement for B S in Pharmacy, School of Pharmacy, University of Pittsburgh

² Professor of Materia Medica and Botany, School of Pharmacy, University of Pittsburgh

measured in the Warburg vessels with the Haldane Barcroft manometers, using the technique described by Warburg (3)

The heart tissue of the healthy guinea pig was selected for the studies on *Galinsoga*. The tissue was finely minced according to the method used by Voegtlin and collaborators (4). This fresh tissue was used in 100-mg quantities, accurately weighed and immediately transferred to the respirometer trough. All results are reported on a basis of 100 mg of fresh tissue. Air was the source of oxygen and the carbon dioxide was absorbed by a solution of sodium hydroxide contained in a separate compartment in the respirometer trough. With few exceptions the experiments were run for a period of two (2) hours.



Experiment No 1—Object To determine the influence of a 1% Infusion of *Galinsoga*

1—100 mg of heart tissue in Locke's Solution 2 and 3—100 mg of heart tissue in 1% Infusion of *Galinsoga*

Results The effect of the Infusion of *Galinsoga* on the same heart tissue is clearly shown. The increase in oxygen consumption caused by similar quantities of the same infusion was 95.5%.

Experiment No 2—Object To determine if a stronger infusion would cause a relatively greater increase in oxygen consumption.

1—100 mg of heart tissue in Locke's Solution 2—100 mg of heart tissue in 2% Infusion of *Galinsoga* 3—100 mg of heart tissue in 2% Infusion of *Galinsoga*

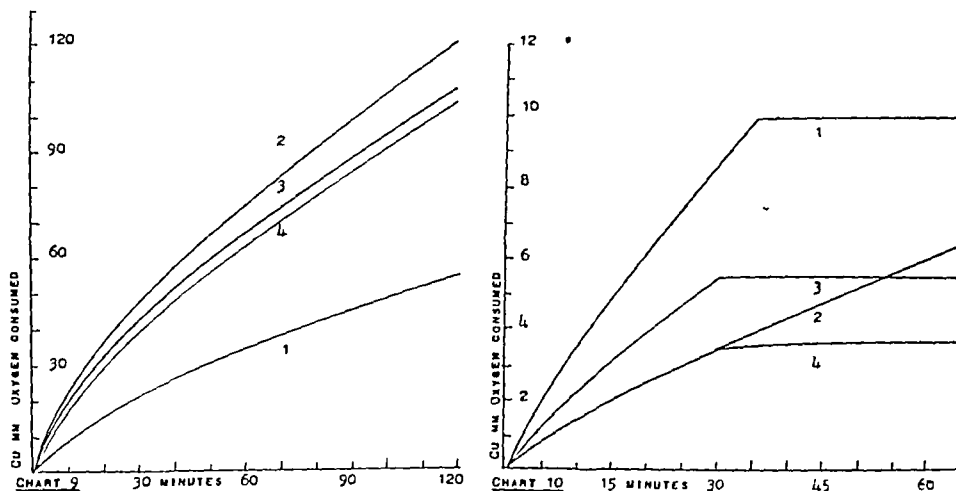
Results This infusion caused an increase of 106.5 to 108% in the oxygen consumption. It appears as though the double strength infusion contains little more of the active constituents than the 1% infusion.

The material used consisted of the dried leaves, stems not over three (3) mm in diameter and flowers of *Galinsoga parviflora*. Infusions were made of this material according to the general method by adding boiling water to the material and allowing to stand for one (1) hour before filtering. These infusions were made using 1 and 2 Gm of the drug for 100 cc of the finished product, respectively. After filtration these preparations were buffered with the salts used in the preparation of Locke's Solution and in the same concentrations, dextrose being omitted. In all experiments where an infusion was used, 3 cc was the quantity added to the respirometer trough.

pared, treated with Litharge, filtered, Hydrogen Sulphide was passed through the filtrate, filtered, concentrated on a water-bath, product was a sticky brown mass containing crystals 100 mg of the heart tissue was suspended in Locke's Solution containing 100 mg of this crystalline mass A control was run to determine the uptake of Oxygen by 100 mg of the same material A heart tissue control in Locke's Solution was also run

Results 1—Oxygen uptake by 100 mg of the mass of crystals 2—100 mg of heart tissue in Locke's Solution containing 100 mg of the crystalline mass 3—100 mg of heart tissue in Locke's Solution

Curve 2 shows an inhibition of oxygen consumption when the crystals are added to the Locke's Solution in which is suspended the heart tissue



Experiment No 9—Object To study the influence of an Infusion of Digitalis on the oxygen consumption of heart tissue and to compare the activity of the same with the activity of an Infusion of Galinsoga

1—100 mg of heart tissue in Locke's Solution 2—100 mg of heart tissue in 1% Infusion of Galinsoga 3—100 mg of heart tissue in 1% Infusion of Digitalis 4—100 mg of heart tissue in 1% Infusion of Digitalis

Results Curves 3 and 4 indicate the action of Infusion of Digitalis in the quantities and concentration used is uniform and that Infusion of Digitalis increases the oxygen consumption of heart tissue Infusion of Digitalis in the quantities used caused an increase of 76.3 and 83% respectively Infusion of Galinsoga in the same concentration caused an increase of 105% in oxygen consumption

Experiment No 10—Object To determine the oxygen uptake by 1 and 2% Infusions of Galinsoga No tissues were used in this experiment

1—1% Infusion of Galinsoga 2—Same 3—2% Infusion of Galinsoga 4—Same

Results—While the infusion in the quantities used in these experiments show little in the way of oxygen uptake blank should always be run and proper corrections made

7 Infusion of Digitalis apparently contains a principle which causes an increase in oxygen consumption

8 This series of experiments suggest the possibility that studies of the influence of drugs on the oxidative processes in animal tissues to be measured by the use of a micro-respirometer might be the basis of the following investigations

(a) The potency of principles in plant and animal drugs

(b) The activity of the various fractions that occur during the investigative stages of drug extraction

- (c) The activity of various cardiac drugs on cardiac muscle and other tissues
- (d) The development of a method of biological assay for the standardization of the cardiac group of drugs

REFERENCES

- (1) Reif, Edward C. *Jour A Ph A*, 20, 62 (1931)
- (2) Muller, Dr Karl, "Arbeiten der Deutschen Landwirtschafts Gesellschaft"
- (3) Warburg, "Metabolism of Tumors" (First American Edition)
- (4) Voegtlin, Rosenthal and Johnson, Reprint 1449 from Public Health Report, "The Influence of Arsenicals and Crystalline Glutathione on the Oxygen Consumption of Tissue"
- (5) Rosenthal and Voegtlin, Reprint 1456 of Public Health Report, "The Action of Sulphydryl, Iron and Cyanogen Compounds on the Oxygen Consumption of Living Cells"
- (6) Harrison, Douglas C., "The Action of Vitamin C on the Oxidation of Tissues *in Vitro*," *The Biochemical Journal*, 27 (1933)

PHYTOCHEMICAL NOTES * 1

No 112 PRELIMINARY CHEMICAL EXAMINATION OF CORYDALIS AUREA

BY HAROLD EPPSON

Thirty-five kilograms of air-dried herb collected in full bloom near Laramie, Wyoming, at an altitude of about 7400 ft were percolated with alcohol in a Lloyd extractor, yielding 8920 Gm of extractive, calculated on a moisture-free basis

The alcoholic extract was extracted with petroleum ether, yielding an oily extract that weighed 1382 Gm. This was saponified with alcoholic KOH in the usual manner

Isolation of Dimyristylcarbinol—The saponified petroleum-ether extract was heated to remove the alcohol. Upon cooling a solid, waxy, yellow-red material formed on the surface. Additional similar material was obtained from the ether extract of the saponified fat. After repeated recrystallization from alcohol and methyl alcohol a light cream-colored material was obtained which melted at 81–82°. The acetylated product, after two recrystallizations from alcohol, melted at 44–45°. Elementary analyses yielded the following results

	I	II	Computed for $C_{25}H_{40}O_2$
C	79.4%	79.5%	79.3%
H	13.3%	13.4%	13.3%

Upon saponification the acetate yielded as saponification values, 124, 119 and 120, respectively. The regenerated alcohol, after recrystallization from both methyl and ethyl alcohol, melted at 81–82°. Elementary analyses yielded the following results

	I	II	Computed for $C_{27}H_{44}O$
C	81.6%	81.8%	81.7%
H	14.2%	14.2%	14.2%

* Scientific Section, A Ph A, Madison meeting, 1933

¹ From the laboratory of Edward Kremers

According to Kipping,¹ dimyristylcarbinol melts at 80.5–81° and its acetate at 45–45.5°. Sando² records the melting point of the alcohol at 81.5–82°.

The total amount of non-saponifiable material obtained by shaking the saponified mixture with ether amounted to 340 Gm.

The saponified fat, after removal of the non-saponifiable material, was treated with sulphuric acid to liberate the free fatty acids. The free acids were treated according to the Twitchell³ method, with slight modifications and thereby separated into 180 Gm. of solid fatty acids and 234 Gm. of liquid fatty acids.

The main alcoholic extract after extraction with petroleum ether was diluted with water and acetic acid to about 33 liters, sufficient acetic acid being added to make it about one per cent acid. After standing for two and one-half days the precipitated resinous fraction, weighing about 540 Gm. air dry, was filtered off. The filtrate was made alkaline with ammonium hydroxide. A flocculent gray-green precipitate formed and was filtered off.

Alkaloid C 1—This gray-green precipitate was extracted with ether while still moist. It was then dried somewhat and extracted with ether made alkaline with ammonium hydroxide. Upon standing in an open beaker, the ether extract deposited a mass of nodular crystals weighing 53.5 Gm., and colored green from contaminating chlorophyll.

By fractional crystallization 22 Gm. of alkaloid, m. p. 135–138° and 31 Gm. of alkaloid, m. p. 135–139° were obtained, called alkaloid C 1. This alkaloid is colorless in concentrated H₂SO₄ and gives immediate red color with concentrated HNO₃. It is optically active, $[\alpha]_D^{20}$ –265 (in chloroform or absolute alcohol). Upon recrystallization the m. p. was 138–140° and $[\alpha]_D^{25}$ –271. Determination of the methoxy groups gave 33.47 and 32.7 per cent, respectively.

Upon cooling the HI mixture from the methoxy determination a precipitate formed. This was filtered off and washed with water, giving a cream-colored powder, m. p. 278–280° with decomposition.

Alkaloid C 2—The ammonium hydroxide precipitate after extraction with ether was dried and powdered and, further extracted with ether, made alkaline with ammonium hydroxide. This ether upon evaporation deposited some needle-like crystals of alkaloid C 2. These were recrystallized from alcohol when they formed as flat shiny plates, melting at 148–149°. They gave a yellow color instantly with concentrated HNO₃.

This alkaloid is optically inactive. The hydrochloride forms needles, recrystallized from hot water, melting at 238–239°. A methoxy determination run by the Hewitt and Moore modification of the Zeisel method gave 33.7 and 34 per cent, respectively. From the formula given below by Chou this shows the presence of four methoxyl groups. The demethylated product recovered from the HI reaction mixture formed a cream-colored crystalline precipitate, m. p. gradually darkens, decomposes 278–280°.

This alkaloid is probably the same as that isolated from *Corydalis aurea* by Heyl⁴ and from *C. ambigua* by Chou⁵. Chou gives the formula as C₂₀H₂₈O₄N.

¹ *J. Chem. Soc.*, 63, 459 (1893).

² *J. Biol. Chem.* 56, 457 (1927).

³ *Ind. Eng. Chem.* 13, 906 (1921).

⁴ *Apoth. Ztg.* 25, 137 (1910).

⁵ *Chinese J. Physiol.*, 2, 203 (1928), 3, 69 (1929).

and the melting point of the hydrochloride as 218° , acid oxalate, m p 208° , acid sulphate, m p 238° and neutral sulphate, m p 220°

The filtrate from the ammonium hydroxide precipitate was extracted with ether. Upon standing a mixed mass of alkaloid crystals formed. From the mixed crystals a few large crystals were separated out mechanically. These weighed 6 Gm and melted partially at 100° and finally at $140-142^{\circ}$, with a rotation of $[\alpha]_D^{25} -272$. They are probably the same as C 1.

The remainder of the mixed crystal mass, weighing 30 Gm, was treated with hot 95 per cent alcohol which dissolved out the clear crystals and left the round opaque nodules (D 2).

Alkaloid D 2—These insoluble nodules weighed 10 Gm, m p $197-198^{\circ}$. Recrystallized from chloroform-alcohol they melted at $200-202^{\circ}$. The chloroformic solution was yellow with a green fluorescence. The acid oxalate forms prisms, m p $242-243^{\circ}$. This alkaloid is optically inactive and contains no methoxy groups. It is similar to *Corydalis C* isolated from *C. ambigua* by Chou and which he compares to protopine.

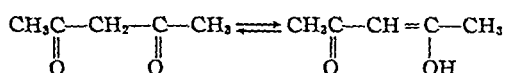
The alcoholic solution from which the insoluble alkaloid D 2 had been filtered did not form any crystals upon standing. After solution in acid and precipitation with alkali the alkaloidal material was dissolved in alcohol and treated with charcoal. After standing several weeks some large crystals formed. These crystals melted at $140-142^{\circ}$. They have an optical rotation of $[\alpha]_D^{25} -275$. The hydrochloride forms columns from hot water, m p 260° . A methoxy determination gave 32.7 per cent methoxy groups. This alkaloid is very similar if not identical with alkaloid C 1.

AN ATTEMPT TO KETONIZE ERGOSTEROL *¹

BY E. MONESS AND W. G. CHRISTIANSEN

At the Indianapolis meeting of the American Chemical Society in March 1931, Dr. Bills reported on the heat of combustion of ergosterol. From his work he concludes that in the activation of ergosterol there is no absorption of energy, but that the activation depends upon chemical isomerization.

It is known that ergosterol has a complex molecule, part of which is alicyclic and contains an alcoholic hydroxyl group and an ethylenic linkage. Aliphatic ketones are capable of existing in an enolic form, and in some instances the compound is a mixture of the keto and enol forms. The extent to which the compound exists either as the keto or enol form is dependent upon the structure of the compound. Acetyl acetone may be used as an example.



When a compound is capable of reacting in both the keto and enol forms it will react entirely in accordance with the ketonic structure or entirely in accordance with the enolic structure, depending on the particular reaction which is being ap-

* Scientific Section, A. P. H. A., Washington meeting, 1935. ¹ Research Department of the Chemical and Pharmaceutical Laboratories, E. R. Squibb and Sons, Brooklyn, N. Y.

pled Ergosterol is known in its enolic form but as yet there is no evidence of its existence in the keto form

If it is true that the activation of ergosterol by ultraviolet light depends upon a chemical isomerization, and if ergosterol could be made to form a keto isomer, such rearrangement should result in a substance possessing anti-rachitic activity, or capable of being activated The simplest reagent which reacts specifically with ketones is hydroxylamine, and this substance was therefore used in an attempt to form the oxime of ergosterol We realized, of course, that a possible keto-enol isomerization might not be the explanation of the activation of ergosterol, but in view of Dr Bills' conclusion that activation is due to chemical isomerization, and in view of the fact that keto-enol isomerism is here theoretically possible, it was of sufficient interest to warrant investigation

In carrying out the actual experiment we subjected ergosterol to a reaction with hydroxylamine under conditions which were known to give an almost quantitative yield in the formation of the oxime of cyclohexanone Ergosterol, however failed to react and was recovered unchanged from the reaction mixture

EXPERIMENTAL

First, we repeated the work of Bayer (1) in the preparation of the oxime of cyclohexanone, in order to make certain that the conditions of the work were such as to insure a nearly quantitative yield of the oxime We then proceeded to react ergosterol with hydroxylamine, under the same conditions, as follows

1 152 Gm of pure ergosterol, m p 158°C , were dissolved in 40 cc of boiling absolute alcohol under reflux To this solution was added 0 4 Gm (2 mols) of hydroxylamine hydrochloride, and 0 6 Gm (slightly more than 2 mols) of sodium bicarbonate The mixture was refluxed for 3 hours It was then evaporated to dryness and extracted with ether The ether extract was evaporated to dryness, yielding 0 8 Gm of a white substance having a melting point of 157°C We had thus recovered most of our ergosterol in an unchanged condition

REFERENCE

- (1) Bayer, *Ann* 102, 102 (1894)

OPENING OF THE LEXINGTON FEDERAL NARCOTIC FARM

The first United States Narcotic Farm, near Lexington, Ky, will open for the reception for admissions on or about May 1st According to the *Journal A M A*, of February 16th it will accommodate a maximum of 1000 persons and is designed to accommodate males only Its object and purposes are to rehabilitate, restore to health and train to be self supporting and self reliant those who are admitted thereto The control management and discipline are to be maintained for the safe

keeping of the individual and the protection of the community Experiments are to be carried on to determine the best methods of treatment and research in this field and the results disseminated to the medical profession and the general public to the end that states may make some provision for establishing a similar policy for helping to solve the problem of drug addiction The function of the institution at Lexington therefore assumes the character of a treatment and research center and of an educational and rehabilitation center with certain custodial features superimposed

BIBLIOGRAPHY OF PHARMACEUTICAL RESEARCH

Compiled by A G DuMez, Reporter on the Progress of Pharmacy

All articles in these lists will be presented in abstract form in the bound volumes of the Year Book, which is issued annually. Those desiring abstracts immediately can obtain them for a fee of one dollar each by communicating with A G DuMez, University of Maryland, School of Pharmacy, N W cor Lombard and Greene Sts, Baltimore, Maryland

PHARMACOPŒIAS AND FORMULARIES

Parry, Ernest J
Shellac in the B P C A criticism
Chem & Drug, 122 (1935), 46

APPARATUS AND MANIPULATIONS

Anon
A review of modern apparatus used in current manufacturing processes
Chem & Drug 122 (1935), 96
Steinbrück R
New apparatus for the detection and determination of arsenic according to the methods of Gutzeit and Beck-Merres
Pharm Zentralh, 76 (1935), 5

PHARMACEUTICAL HISTORY AND LEGISLATION

Anon
Definitions for surgical spirit
Chem & Drug, 122 (1935), 95
Freise, Fred W
Cosmetic knowledge of the Brazilian Indians
Riechstoff Ind 9 (1934) 171-173, through
Chem Abstr 29 (1935) 833

PHARMACEUTICAL PREPARATIONS

Anon
Reader's problems
Pharm J, 133 (1934), 741
Anon
Sterilization notes
Pharm J, 134 (1935) 58
Knight, W A
Sinclair's glue
Pharm J, 134 (1935), 7
Lucas, V
Preparation of mercury salves using ferric chloride
Boll assoc brasl pharm, 14 (1933), 110-111 through *J Soc Chem Ind*, 54 (1935), 45B
Nonhebel G K A
Preparation of ointments containing rosin
Pharm Weekbl, 71 (1934), 1408
Ravaud C-J
Note on the preparation of chloral suppositories
J pharm chim, 21 (1935), 49

Sido M
Mucilage of acacia and the detection of oxidases
Pharm Ztg 80 (1935), 12
van Pinxteren, J A C
The pharmacy of ergot
Pharm Weekbl, 71 (1934), 1230-1243, cf
C A, 26, 3616 through *Chem Abstr*, 29 (1935), 544

PHARMACOLOGY, TOXICOLOGY AND THERAPEUTICS

Anon
Pharmacology and therapeutics of curare
Pharm J 134 (1935), 60
Beerman, Herman, *et al*
Dioxyanthranol 1-8 as a substitute for Chrysarobin
J A M A, 104 (1935), 26
Brard, D
Toxicologic study of some chromium derivatives
J pharm chim, 20 (1934) 549, 21 (1935) 5
Chopra R N, Ghosh, N N, and Mukerji A K
Anthelmintic properties of *Vernonia anthelmintica* Willd (*Serrulata anthelmintica*)
Indian J Med Research, 22 (1934) 183-186 through *Chem Abstr* 29 (1935), 884
Colombi, Camillo Long M, and Tosatto, A
The standardization of insulin preparations
Biochim terap sper, 21 (1934) 378-384 through *Chem Abstr* 29 (1935) 551
Eschenbrenner H
Grape sugar and its therapeutic application
Pharm Ztg 80 (1935), 70
Fang Chih Tung
Use of benzylephedrine as an analgesic in chaulmoogra injections
Chinese Med J 48 (1934), 563-570, cf *C A*, 24 4855, through *Chem Abstr*, 29 (1935) 289
Kausch, O
Quantitative determination of insulin content of liquids, tissues, etc
Pharm Ztg, 80 (1935), 33
Lennox, W G, Gibbs, E L, and Gibbs F A

Effect of ergotamine tartrate on the cerebral circulation of man

J Pharmacol & Exper Therap, 53 (1935), 113
Sachs, Wilbert

Accidental overdose of phenolphthalein in a child without ill effects

J A M A, 104 (1935) 45

Spies, Joseph R

Croton resin II The toxic and vesicant action of certain of its derivatives

J Am Chem Soc, 57 (1935) 182

Spies, Joseph R

Croton resin I Toxicity studies using gold-fish

J Am Chem Soc, 57 (1935), 180

Wright Charles I, and Barbour, Fleming A
The effect of morphine, dihydromorphine, dihydromorphinone (Dilaudid) and dihydrocodeinone (Diconid) on the respiratory activity of the rabbit

J Pharmacol & Exper Therap 53 (1935), 34

Tainter, M L Bergstrom, F W and Cutting W C

Metabolic activity of compounds related to dinitrophenol

J Pharmacol & Exper Therap 53 (1935), 58

Van de Velde, A J-J

The quantitative determination of the biologic value of yeast medicinals

J pharm Belg 17 (1935), 1 21

VEGETABLE AND ANIMAL DRUGS

Anon

Report on liquorice root from Cyprus

Cyprus Agr J 29 (1934), 5-6 through
Chem Abstr, 29 (1935) 92

Anon

Vetiver roots from Uganda

Uganda Protectorate Ann Rept Dept Agr
1933, 1 (1934), 25-26, through *Chem*
Abstr 29 (1935), 292

Drafehn E

On knowledge of Syzygium jambolana

Apoth-Ztg, 50 (1935) 112

Marangoni, P

Investigations on cultivated rhubarbs

Scienza farm, 2 No 1 (1934) 13-23, through
Chem Abstr, 29 (1935), 888

Martin, F M and Brocal, M M

A chemical study of Sierra Nevada digitalis
Anales soc españ fis quim 32 (1934), 838-842, through *Chem Abstr*, 29 (1935), 888

Perrot, E

Chaulmoogra species, particularly Krabao indochinois, for the treatment of leprosy

Bull sci pharmacol, 36 (1934) 641

Rae John

A colorimetric test for quillaia saponin

Pharm J, 134 (1935), 59

Simon, I

Sardinian digitalis

Arch farmacol sper 58 (1934), 101-106, through *Chem Abstr*, 29 (1935), 543

Smith, T, and H

Two new crystalline principles from Indian species of Artemisia

Pharm J, 134 (1935), 3

Vollmer, Hubert

The tannin content of Labiatae

Arch expil Path Pharmacol 176 (1934), 207-216, through *Chem Abstr*, 29 (1935), 883

Waldstätten C

Mucilaginous drugs and their evaluation

Scientia Pharm, 5 (1934) 95-98, through
Chem Abstr, 29 (1935), 292

ALKALOIDS AND GLUCOSIDES

Collard M E

A new falsification of cocaine

J pharm chim, 21 (1935), 57

Freise F W

Pharmacologically active constituents of Bixa orellana L

Pharm Zentralh, 76 (1935), 4

Goin, F A

Colorimetric determination of morphine in opium

Anales farm bioquim 5 (1934), 93

Jacobsen, Astrid, and Schou, Svend Aage

Alkaloidal content of cinchona bark and cinchona decoction

Dansk Tids Farm, 9 (1935), 1

Kofler, A

Microchemical detection of caffeine and theobromine

Mikrochemie 15 (1934) 319-330 through
Chem Abstr, 29 (1935), 292

Raymond Hamet, and Millat, L

On the alkaloids of Mitragnyna stipulosa O Kuntze

J pharm chim 20 (1934), 577

Reimers, F

Quantitative determination of theophylline in soluble theophylline combinations

Dansk Tids Farm, 9 (1935), 11

Rizzotti, Giovanni

A new colorimetric method for determining morphine and its derivatives

Boll soc ital biol sper, 9 (1934), 509-510, through *Chem Abstr*, 29 (1935), 293

Rossi, L., and Sozzi, J. A

Quinine and quinidine A differentiating reaction

Annales farm biochim, 5 (1934), 107

Sanchez J. A

A new color reaction of quinine, quinidine and cupreine and its application to the determination of quinine

J pharm chim, 21 (1935), 24

OILS, FATS AND WAXES

Drake, Nathan L., and Spies, Joseph R

Croton Resin III The combined acids

J Am Chem Soc, 57 (1935), 184

Lauro, M. F

Olive-oil adulteration and the analyst

Oil and Soap, 11, No. 12 (1934), 253-254, through *Chem Abstr*, 29 (1935), 551

McKinney, R. S., Carter, J. L., and Jamieson, Geo. S

The oil content of soybeans

Oil and Soap, 11, No. 12 (1934), 253-261, through *Chem Abstr*, 29 (1935), 551

ESSENTIAL OILS

Anon

Report on peppermint oil from Cyprus

Cyprus Agr J, 27 (1932), 56-59, 28 (1933), 39-41, through *Chem Abstr*, 29 (1935), 292

Müller, A

Viscosity, surface tension and capillariscope behavior of essential oils

J prakt Chem, 141 (1934), 167-192, through *J Soc Chem Ind*, 54 (1935), 46B

Walker, James

The biogenesis of some terpenes

J Soc Chem Ind, 54 (1935), 55

ANALYTICAL METHODS AND RESULTS

Arnold, F. W., Jr., and Chandlee, G. C

Normal-propylarsonic acid as a reagent for the determination of zirconium

J Am Chem Soc, 57 (1935), 8

Bryant, W. M. D., and Smith, Donald M

Improved hydroxylamine method for the determination of aldehydes and ketones Displacement of oxime equilibria by means of pyridine

J Am Chem Soc, 57 (1935), 57

Budde H

Volumetric determination of barbituric acid derivatives

Standsatz deuts Apoth (Apoth-Ztg), 49 (1934), 295, through *J Soc Chem Ind*, 54 (1934), 45B

Caldwell, John R

The iodometric determination of copper

J Am Chem Soc, 57 (1935), 90

Caldwell, John R., and Moyer, Harvey V

Determination of chloride

Ind Eng Chem, Analyt Edit, 7 (1935), 38

Celsi, S. A

A new reaction for the estimation of calcium

Annales farm biochim, 5 (1934), 85

De Prado L

New micro-method of determining glycerol in liquid ferments

Annales farm biochim, 5 (1934), 98

Feigl, F., and Krumholz P

Detection and determination of copper in pharmaceutical preparations

Sci Pharm, 5 (1934), 19-21, through *J Soc Chem Ind*, 54 (1935), 45B

Fernand and Girault, J

Determination of some local anesthetic derivatives of amino-alcohols

J pharm chim, 20 (1934), 584

Giordano, R

Analysis of ointment of methyl salicylate

Annales farm biochim, 5 (1934), 90

Goodman, Herman

Quantitative estimates of hydrogen sulphide in lotions used in treatment of acne

Arch Dermatol Syphilol, 28 (1933), 847-854, through *Chem Abstr*, 29 (1935), 291

Griebel, C

On the detection of intoxicating poisons in the sense of the opium regulations

Apoth-Ztg, 50 (1935), 15

Guillaume, A., and Mme Aduot

Distillation of aromatic waters for the determination of the volatile constituent

Documentation sci, No. 23 (1934), 84-87, through *Chem Abstr*, 29 (1935), 886

Herd Magnus

The assay process for potassium iodide in Liquor Iodi Fortis, B. P. and Liquor Iodi Mitis, B. P.

Pharm J, 134 (1935), 87

Justinianos A., and Pierry, J

Determination of quinine in chocolate tablets

Praktika (Akad Athenon), 8 (1933), 173-176, through *Chem Abstr*, 29 (1935), 543

Mosig, A

Testing of medicinals and the "incompatibility" of ions

Pharm Zentralh, 76 (1935), 33

Müller J. A

On new analytical numbers for drugs and galenicals V

Apoth-Ztg, 50 (1935), 93

(Concluded on page 167)

ADSORPTION OF STRYCHNINE SULPHATE BY VARIOUS CHARCOALS
AND BY LLOYD'S REAGENT ¹BY JOHN F SUCHY² AND R V RICE

In various phases of industry charcoal ranging from the crude technical product to the highly activated form finds much practical application. The pharmacist in his field is often called upon to use charcoal either as a filtering or as an adsorbent medium and as a rule but little consideration is given to the amount of active medicinal ingredient which may be lost in the process. It is also of interest to know relatively the adsorbing power of these filtering media.

The present research was undertaken to gain some information as to the diminution of potency of strychnine sulphate solutions when brought in contact with a number of commercial charcoals and with Lloyd's Reagent. The results obtained show relatively the adsorbing powers of these media with respect to almost any dissolved substance (1).

EXPERIMENTAL

Identical procedures were followed in all cases to show the variation of adsorption of strychnine sulphate by the various adsorbing media. Groups of from five to ten samples were run together, each sample representing a different concentration of strychnine sulphate.

The following procedure was employed:

Exactly one Gm of adsorbent was weighed out and a calculated quantity of strychnine sulphate added. To this was added exactly 100 cc of distilled water and the mixture tightly stoppered and warmed on a steam-bath until solution of the alkaloidal salt was effected. Each flask was then cooled to 25° C and allowed to stand for 24 hours in a wall case where the variation of temperature was not over 2 degrees. The contents were shaken frequently to aid in reaching equilibrium. After the proper time interval, the mixtures were filtered and a 25 cc portion of each was pipetted into a separatory funnel. The solution in each case was made alkaline with 5 cc of 10 per cent ammonia and allowed to stand a short time until completion of precipitation. The strychnine was then entirely extracted with chloroform, the latter being added in small portions. Each chloroformic solution was filtered into a tared beaker which was then placed in a 50 degree oven where the solvent was evaporated. The residue was finally dried in another oven at 100° C for about 30 minutes, weighed and calculated as the sulphate. The difference between this result and the original weight of the sulphate gave the amount of the latter adsorbed per Gm of charcoal.

Each sample of the strychnine salt used in this study was assayed by dissolving a carefully weighed quantity in water, making the solution alkaline with ammonia and extracting the resulting alkaloid with chloroform. The strychnine thus obtained was calculated as the sulphate. Any deviation from the pure salt was taken into consideration in all subsequent determinations.

In order to obtain an idea of the amount of strychnine sulphate adsorbed by the filter paper used in the process, a series of blank determinations was run, the charcoal being omitted. The other details of the procedure were identical. The results obtained showed such small deviations from no adsorption that any loss due to this factor was neglected.

¹ This article is based on a dissertation by R V Rice presented in partial fulfillment of the degree of Master of Science at the University of Montana, 1934.

² Professor of Pharmacy University of Montana

DISCUSSION

I Solvent—Water Time—24 Hours—Seven different charcoals and Lloyd's Reagent were used in this investigation Charcoals designated by number are activated forms sold on the market to-day

By plotting the original concentration of strychnine sulphate against the amount adsorbed per Gm of charcoal, an isotherm was obtained in each case as is shown in Figs 1 and 2 which represent the adsorption efficiency

Charcoal No 1 proved by far the best adsorbent of the group, adsorption being complete up to a concentration of nearly 5 Gm per L None of the other charcoals used showed total adsorption beyond concentrations of 2 Gm per L On the other hand, willow charcoal (Curve No 7), the type used in most pharmaceutical operations, proved by far the poorest adsorbent of the group, taking up only 11 per cent of the salt when the original concentration was but 1 Gm per L

Bone black (Curve No 6) showed a surprisingly high adsorbing power Like the willow charcoal there was no finite concentration at which total adsorption took place, but the percentage of adsorption dropped much less rapidly with increasing concentrations

The other carbons used proved intermediate in their affinity for the alkaloidal salt No 2 and No 4 gave total adsorption in concentrations to almost 2 Gm per L, while No 3 and No 5 adsorbed completely up to about 1 Gm per L Lloyd's Reagent (Curve No 8) also proved an intermediate adsorbent but differed from the others in that the percentage adsorbed at higher concentrations fell much less rapidly

In order to make a direct comparison of the adsorption efficiency of each charcoal in the different concentrations, the results were tabulated to show the per cent of strychnine sulphate adsorbed These results are shown in Table I

TABLE I—PER CENT OF STRYCHNINE SULPHATE ADSORBED

Adsorbent	1	2	3	4	5	6	7	8	10	12
Charcoal No 1	100	100	100	100	97 7	89 0	77 9	69 0	56 1	47 1
Charcoal No 2	100	94 5	76 3	62 6	52 0	44 2	38 9	34 4	28 8	25 9
Charcoal No 3	100	95 5	80 4	69 3	60 1	51 7	44 7	39 2	31 5	26 4
Charcoal No 4	100	89 0	66 3	51 9	41 9	35 2	30 3	26 5	21 7	18 5
Charcoal No 5	94 0	75 6	63 3	54 5	48 0	42 8	38 4	34 6	28 6	24 0
Bone black	36 3	36 0	35 4	34 7	33 5	31 7	29 8	27 9	24 7	21 6
Lloyd's Reagent	100	83 2	75 4	65 2	55 5	49 0	43 7	39 3	33 2	28 3
Willow charcoal	11 0	10 3	10 0	7 8	6 3	5 3	4 5	3 8	3 2	2 6

II Langmuir's Equation—Langmuir's equation for the expression of adsorption isotherms has been found in most cases to hold more nearly true over wider ranges of concentration than does Freundlich's equation (2)

These equations are

1 Langmuir's equation, $\frac{C}{Q} = \frac{1}{ab} + \frac{C}{b}$, where C is the original concentration, Q is the quantity adsorbed and a and b are constants

2 Freundlich's equation, $\left(\frac{x}{m}\right)^n = kc$, where x is the amount adsorbed, m is the weight of adsorbent and c is the original concentration, k and n being constants

By plotting logarithms of the values of x/m against c of Freundlich's equation a straight line results if the original curve obtained by plotting x/m against c proves

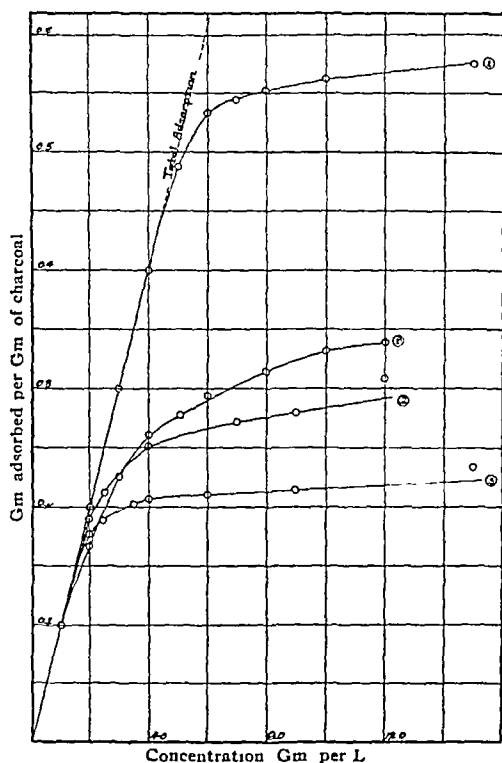


Fig 1

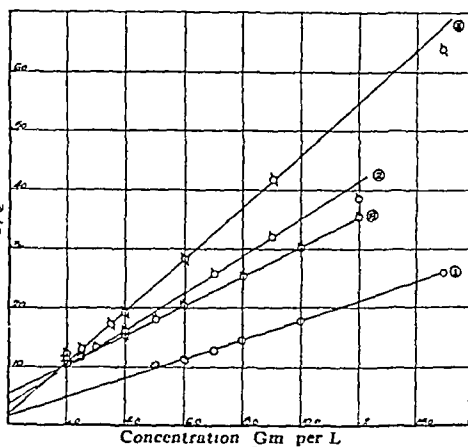


Fig 3

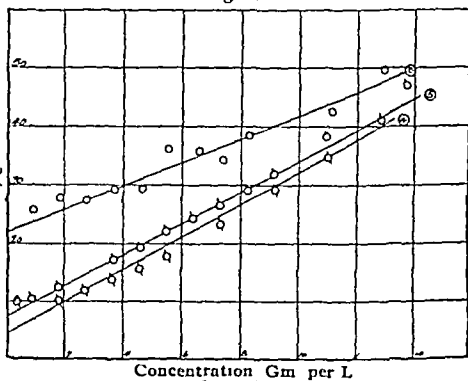


Fig 4

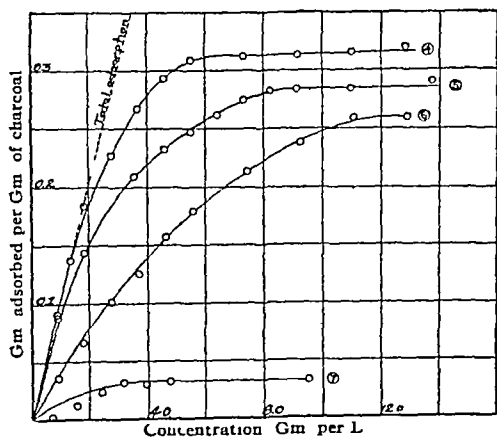


Fig 2

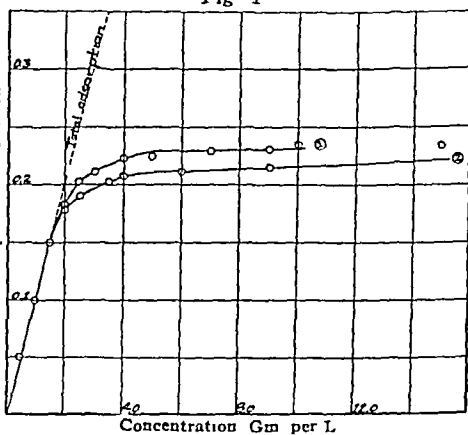


Fig 5

to be a parabola (3) As can be seen by inspection of the isotherms of Figs 1 and 2, none of these curves is by any means perfect parabolas, hence Freundlich's equation is not suitable for the expression of these isotherms

On the other hand the plotting of C/Q against C of Langmuir's equation gives a near straight line in most of the cases tried. The plots of these values are shown in Figs 3 and 4. It was found that the sample of willow charcoal used yielded such extremely high values for C/Q that plotting of its curve in these figures was impossible. The large variation also obtained in the values of C/Q indicates that this equation does not represent the isotherm very satisfactorily. All the other curves conform quite well to the equation as shown by the figures (see Figs 3 and 4. Curve 6—bone black, Curve 8—Lloyd's Reagent)

TABLE II—CONSTANTS OF LANGMUIR'S EQUATION

Charcoal	a	b
No 1	1 154	0 610
No 2	0 144	0 336
No 3	1 969	0 231
No 4	0 329	0 483
No 5	0 318	0 393
Bone black	0 062	0 734
Lloyd's Reagent	0 455	0 400

The constants a and b of Langmuir's equation were calculated for each carbon by plotting the curves of Figs 3 and 4 on quite a large scale in order to obtain the slope of the lines and their Y-intercepts more accurately. These values are shown in Table II.

III Solvent—Water Time—48 Hours—The same procedure employed in the preceding 24-hour determinations was followed in this case, with the exception that the period of contact was prolonged to 48 hours. Isotherms were determined for Charcoal No 1 and Charcoal No 3.

Charcoal No 1 gave an isotherm identical with the one obtained in the shorter period of contact. This means that equilibrium must have been reached between the adsorbent and the strychnine sulphate solution within 24 hours of contact and this equilibrium was permanent for at least an additional 24 hours.

Charcoal No 3 on the other hand adsorbed more alkaloid when left in contact with the solution for 48 hours than it did in the shorter period of time. The results indicate that it takes more than 24 hours for Charcoal No 3 and strychnine sulphate solution to reach adsorption equilibrium. The 48-hour curve in this instance probably represents the equilibrium but no determina-

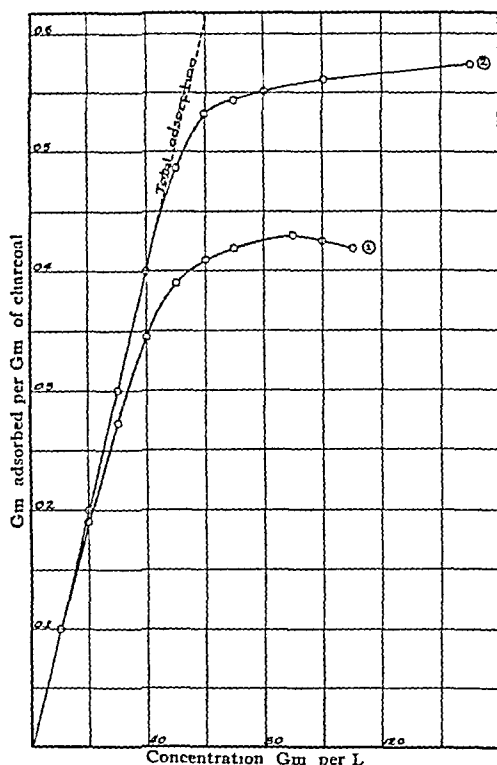


Fig 6

tion involving a longer period of time was run to prove this presumption Curve 1 of Fig 5 is the 48-hour isotherm while Curve 2 is the result obtained in the shorter period of contact

IV Solvent—Alcohol Time—24 Hours—The amount of adsorption is

dependent upon the surface tension of the solvent (4), hence the use of alcohol in place of water should give a different isotherm when all the other factors are constant

The effects of such a change were determined in the cases of Charcoals No 1 and No 2, using commercial alcohol sp gr 0.810 at 26° C which corresponds to about 94 per cent by volume

Figure 6 shows the results secured by use of Charcoal No 1, Curve 1 with alcohol and Curve 2 with water A marked drop in adsorption is evidenced in the alcohol solution, showing total adsorption to a concentration of only 1.5 Gm per

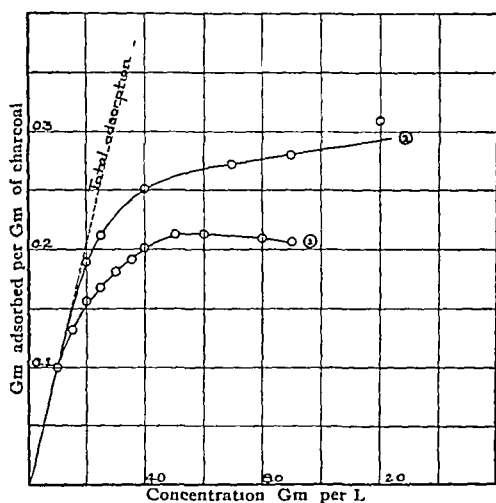


Fig 7

L of alkaloidal salt The alcohol curve also shows a maximum of adsorption at about 9 Gm per L concentration, whereas the water curve rises slowly but steadily upward after the usual sharp bend Table III gives a direct comparison of the amounts adsorbed in each case

TABLE III—PER CENT ADSORBED BY CHARCOAL NO 1

Solvent	Concentration—Gm per L									
	1	2	3	4	5	6	7	8	10	
Water	100	100	100	100	97.7	89.0	77.9	69.0	56.1	
Alcohol	100	95.2	90.9	86.2	78.1	68.2	59.9	53.3	42.6	

Charcoal No 2 with alcohol (Fig 7, Curve 1), shows the same type of diminution in adsorption as does Charcoal No 1 The highest point of total adsorption occurs at a concentration of about 1 Gm per L This point is somewhat lower than that of Charcoal No 1 and the maximum of the curve occurs at about 6 Gm per L concentration in contrast to 9 Gm per L concentration in the case of Charcoal No 1 Table IV presents a direct comparison of quantities adsorbed at different concentrations in the two solvents

TABLE IV—PER CENT ADSORBED BY CHARCOAL NO 2

Solvent	Concentration—Gm per L								
	1	2	3	4	5	6	7	8	10
Water	100	94.5	76.3	62.6	52.0	44.2	38.9	34.4	28.8
Alcohol	100	78.0	61.5	50.3	42.5	35.7	30.4	25.3	20.2

SUMMARY

- 1 The media studied vary widely in their ability to adsorb strychnine sulphate
- 2 One charcoal was found to require more than 24 hours to reach an equilibrium of adsorption

3 Langmuir's equation represents the adsorption curves better than does Freundlich's equation

4 The ability of Charcoals No 1 and No 2 to adsorb strychnine sulphate from solution is less when the salt is dissolved in alcohol than when it is dissolved in water

REFERENCES

- (1) 'Activated Carbon—the Modern Purifier,' pamphlet published by Industrial Chemical Sales Company, Inc (1933)
- (2) Langmuir, Irving, "Adsorption of Gases on Plane Surfaces of Glass, Mica and Platinum," *J Am Chem Soc*, 40 1351-1403 (1918)
- (3) Daniels, Mathews and Williams, *Experimental Physical Chemistry*, page 95
- (4) Getman and Daniels, "Outlines of Theoretical Chemistry" page 240

THE STABILIZATION OF SOLUTION OF IRON AND AMMONIUM ACETATE, U S P X¹

BY WILLIAM J HUSA² AND LYELL J KLOTZ

Husa and Birmingham (1) found that the stability of Solution of Iron and Ammonium Acetate is affected by various factors such as light, heat and variations in the proportions of the ingredients. In the present investigation, further experimentation was undertaken with a view toward increasing the stability of Solution of Iron and Ammonium Acetate, commonly known as Basham's Mixture

Order of Mixing—In the preparation of colloidal solutions, the order of mixing is often an important factor in the stability of the finished product, particularly when substances capable of acting as protective colloids are present. Birmingham (2) prepared Basham's Mixture by 12 different orders of mixing and stored the resulting preparations under three conditions, *i e*, sunlight, darkness and diffused light. Order of mixing appeared to have no effect upon the stability, except in a few cases of diffused light.

Since the tests carried out by Birmingham in diffused light gave some indication that order of mixing might be a factor to consider, further tests were carried out on this point. The materials used were of U S P grade, the ammonium carbonate assaying 31.2% ammonia and the diluted acetic acid being adjusted to 6.0%. Solutions were prepared by two methods: (a) hand mixing, shaking well after the addition of each ingredient, and (b) mechanical mixing, adding each ingredient drop by drop from a burette into a beaker fitted with an electric stirrer, five minutes being allowed after the final addition of each ingredient and efficient mechanical stirring being maintained throughout the process.

In order to designate the orders of mixing concisely, the following numbers are assigned to the various ingredients:

- | | |
|--------------------------------|-------------------|
| 1 Solution of Ammonium Acetate | 4 Aromatic Elixir |
| 2 Diluted Acetic Acid | 5 Glycerin |
| 3 Tincture of Ferric Chloride | 6 Water |

¹ Section on Practical Pharmacy and Dispensing, A. P. H. A., Washington meeting, 1934

² Head Professor of Pharmacy, University of Florida

The orders of mixing were as follows, certain ingredients being omitted in some cases as indicated

MECHANICAL AGITATION

1 + 2 + 3 + 4 + 5 + 6, 3 + 5 + 4 + 1 + 2 + 6, 3 + 5 + 4 + 2 + 1 + 6, 3 + 5 + 2 + 1 + 4 + 6, 3 + 5 + 1 + 2 + 4 + 6, 3 + 1 + 2 + 5 + 4 + 6, 1 + 5 + 3 + 2 + 4 + 6, 1 + 3 + 2 + 5 + 4 + 6, 1 + 2 + 5 + 4 + 3 + 6, 3 + 4 + 1 + 2 + 5 + 6, 3 + 4 + 2 + 1 + 5 + 6, 1 + 3 + 4 + 5 + 6 (2 omitted), 1 + 3 + 5 + 4 + 6

HAND AGITATION

1 + 2 + 3 + 4 + 5 + 6, 1 + 3 + 5 + 4 + 6 (2 omitted)

The solutions were stored under various conditions, 25-cc portions being placed in 1-oz prescription bottles. The solutions were observed daily for evidences of precipitation.

TABLE I—THE EFFECT OF VARIOUS CONCENTRATIONS OF DILUTED ACETIC ACID ON THE STABILITY OF SOLUTION IRON AND AMMONIUM ACETATE

Diluted Acetic Acid	Time of Ppt Days	Diluted Acetic Acid	Time of Ppt., Days
0% (s)	9	8% (s)	19
0%	9	8%	19
2% (s)	11	12% (s)	51
2%	11	12%	52
4% (s)	11	18% (s)	*
4%	11	18%	*
6% (s)	14		
6%	14		

* Did not precipitate during the test period of 60 days

Mechanically mixed samples following the U S P X order of mixing precipitated in 22 days in diffused light and in 29 days in darkness, hand-mixed samples precipitated after practically the same interval. The samples prepared by various other orders of mixing precipitated in 13 to 26 days in diffused light and in 18 to 31 days in darkness. Since differences of a few days might be attributed to experimental error and in any case would not be of much practical significance, it may be safely concluded that the variations in order of mixing showed no advantage over the U S P method. It is further evident that mechanical mixing offers no advantage over hand mixing as far as stability is concerned. Samples of all the above solutions were also stored in a refrigerator at about 6° C, after 18 months, all the samples were still perfectly free from precipitation. It is thus apparent that storage of the solution at refrigerator temperature constitutes an excellent method of avoiding the troublesome deterioration.

Effect of Various Concentrations of Acetic Acid—Samples of Solution of Iron and Ammonium Acetate were prepared containing 0%, 2%, 4%, 6%, 8%, 12% and 18% of Diluted Acetic Acid in the finished preparation. Two 30-cc portions of each sample were placed in 4-oz prescription bottles in diffused light. One sample was shaken daily and the other allowed to remain undisturbed. Table I shows the time of precipitation of these solutions. Samples marked (s) were shaken daily.

It was concluded from the data in Table I, that the time of precipitation is inversely proportional to the quantity of acetic acid present, and that daily agitation has no effect upon the time of precipitate formation

Effect of Addition of Alkali—Specified quantities of a normal solution of sodium hydroxide were added to samples of Solution of Iron and Ammonium Acetate before diluting the mixture to volume with distilled water. Samples were stored in diffused light. Data are shown in Table II.

TABLE II—THE EFFECT OF ADDITION OF ALKALI UPON THE STABILITY OF SOLUTION OF IRON AND AMMONIUM ACETATE

N Alkali in Solution	Time of Ppt., Days	N Alkali in Solution	Time of Ppt. Days
0.5% (s)	7	5.0% (s)	9-27*
0.5%	7	5.0%	10-29*
1.0% (s)	6	10.0% (s)	**
1.0%	6	10.0%	**
2.0% (s)	5		
2.0%	7		

* Precipitated at the end of 9 and 10 days, respectively, the precipitate redissolved within a few hours and did not reappear until the expiration of 27 and 29 days, respectively.

** Did not precipitate during the test period of 60 days.

It was concluded from the data in Table II, that additions of alkali in concentrations of 5% or more of normal solution exert a stabilizing influence upon this preparation. This observation is in accord with theory in that it is well known that ferric hydroxide is more readily peptized in neutral or alkaline than in acid media (3).

Effect of Concentration of Ingredients—Husa and Birmingham (1) have shown that an increase in the concentration of certain ingredients resulted in increased stability of Solution of Iron and Ammonium Acetate. Walter Taylor (4) stated that a double strength preparation is stable, his statement being based upon the U. S. P. formula of 1890. Although the present U. S. P. formula cannot be doubled in strength by the use of the ingredients contained, it is possible to perform the concentration by substituting the proper amount of acetic acid or glacial acetic acid for the required quantity of Diluted Acetic Acid.

In order to determine the stability of a preparation made exactly twice as strong as the present official solution, samples of solution were prepared according to the following formula:

Solution of Iron and Ammonium Acetate

Tincture of Ferric Chloride	80 cc
Glacial Acetic Acid	65 cc
Ammonium Carbonate	50 Gm
Aromatic Elixir	240 cc
Glycerin	240 cc
Distilled Water, q. s.	1000 cc

Mix the glacial acetic acid with 350 cc of distilled water and to this mixture gradually add the ammonium carbonate. After effervescence has ceased, add successively, the tincture of ferric chloride, the aromatic elixir, and the glycerin, and lastly, enough distilled water to make the product measure 1000 cc.

This solution was then stored under the usual conditions in 1-oz prescription bottles, portions of the solutions also being placed in the electric oven at approximately 50° C. In addition, 8-oz bottles of the concentrated preparation were stored under the usual conditions and at the end of each month, 1 fl oz of the concentrate was diluted with an equal volume of distilled water and stored for comparison with a control sample. Data follow in Table III.

TABLE III—THE EFFECT OF DOUBLING THE CONCENTRATION OF ALL INGREDIENTS IN SOLUTION OF IRON AND AMMONIUM ACETATE

Sample	Sunlight.	No. of Days before Ppt Occurred Diffused Light.	Darkness	Oven
U S P Control	5	55	60	1
Concentrate	26	No ppt 6 months	No ppt 6 months	10

In addition, samples prepared by diluting the concentrate were fully as stable as freshly prepared control specimens, no difference being observed in any case between the times of precipitation.

It was concluded from the data in Table III, that a stable preparation can be prepared by doubling the quantities of active ingredients in Solution of Iron and Ammonium Acetate.

SUMMARY

1 The deterioration of Basham's Mixture may be avoided by storing the solution at refrigerator temperature.

2 Basham's Mixture is very stable when prepared double strength, this concentrated preparation may be diluted to double its volume with distilled water just before it is dispensed.

3 The stability of Basham's Mixture may be improved by increasing the proportion of acetic acid or by the addition of alkali, but since these changes would alter the product somewhat, they are not considered as practical as the methods listed under 1 and 2.

REFERENCES

- (1) Husa, William J, and Birmingham, George W, *Jour. A. Ph. A.*, 22, 495 (1933)
- (2) Birmingham, George W, Thesis "The Stability of Solution of Iron and Ammonium Acetate, U S P X" University of Florida, 1932
- (3) Graham, J, *J. Chem. Soc.*, 15, 253 (1862)
- (4) Taylor, Walter, Personal communication to senior author

SCHOOL OF PHARMACY, UNIVERSITY OF FLORIDA
GAINESVILLE FLORIDA

ANALYSIS OF MAGNESIUM CARBONATE *

BY HAROLD R. BOWERS ¹

Samples of Magnesium Carbonate were obtained from eight sources. These were subjected to routine analysis to discover how closely they compared, particularly as to MgO content and to find out how wide a range existed. Also to

* Section on Practical Pharmacy and Dispensing, A. Ph. A. Washington meeting 1934

¹ Assistant Professor of Pharmacy, University of Southern California College of Pharmacy Los Angeles Calif

discover if the various samples conformed to the U S P requirement as to limit of CaO The results of the analysis are given in the following table

TABLE I

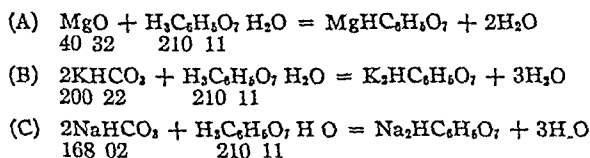
Samples	% MgO	% CO ₂	% H ₂ O	% Al and Fe.		% CaO
1	41 89	29 70	27 52	T	T	0 51
2	46 90	39 50	12 00	T	T	0 58
3	46 90	36 30	16 00	T	T	0 50
4	42 08	35 50	22 10	T	T	0 16
5	43 90	35 80	20 00	T	T	0 01
6	48 50	39 60	11 20	T	T	0 42
7	41 80	36 95	20 12	T	T	0 43
8	48 35	36 44	14 30	T	T	0 41

As shown in Table I, the samples analyzed have an MgO content ranging from 41 80% to 48 50% while the CaO content for all samples is well within the limit (0 80%) set by the U S P X The Al and Fe contents are negligible

The foregoing results are of interest and importance when we consider the U S P X formula for Solution of Magnesium Citrate

Magnesium Carbonate	15 00 Gm
Citric Acid	35 00 Gm
Syrup	60 00 cc
Purified Talc	5 00 Gm
Oil of Lemon	0 10 cc
Potassium Bicarbonate	2 50 Gm
or, Sodium Bicarbonate	2 10 Gm
Distilled Water, a sufficient quantity to make	350 00 cc

On the basis of the following equations we can compute the quantity of Citric Acid to be used in the preparation of Solution of Magnesium Citrate, assuming that we wish to obtain $\text{MgHC}_6\text{H}_5\text{O}_7$ as the active agent in the finished solution



Thus, by using the calculated factors the amount of Citric Acid necessary for a given sample of Magnesium Carbonate can easily be computed

$$\begin{aligned} \text{(A)} \quad & \frac{210 \ 11}{40 \ 32} = 5 \ 2110 \text{ factor for MgO} \\ \text{(B)} \quad & \frac{210 \ 11}{200 \ 22} = 1 \ 0493 \text{ factor for KHCO}_3 \\ \text{(C)} \quad & \frac{210 \ 11}{168 \ 02} = 1 \ 2505 \text{ factor for NaHCO}_3 \end{aligned}$$

EXAMPLE For a Magnesium Carbonate of 48 5% MgO content
 $15 \times 0 \ 485 \times 5 \ 211 = 37 \ 91 \text{ Gm } \text{H}_3\text{C}_6\text{H}_5\text{O}_7 \cdot \text{H}_2\text{O}$ is required

The following table shows the results of similar calculations applied to all samples analyzed, also the total amount of $\text{H}_3\text{C}_6\text{H}_5\text{O}_7 \cdot \text{H}_2\text{O}$ required for both Magnesium Carbonate and NaHCO_3 or KHCO_3 The amount necessary for the latter two substances is, of course, a constant, *v e*, 2 62 Gm

TABLE II

Sample No	Amount of $\text{H}_3\text{C}_6\text{H}_5\text{O}_7 \cdot \text{H}_2\text{O}$ for Magnesium Carbonate Gm	Amount $\text{H}_3\text{C}_6\text{H}_5\text{O}_7 \cdot \text{H}_2\text{O}$ Required for Either KHCO_3 or NaHCO_3 Gm	Total Amount Required Gm
1	32 74	2 62	35 36
2	36 66	2 62	39 28
3	36 66	2 62	39 28
4	32 89	2 62	35 51
5	34 31	2 62	36 93
6	37 91	2 62	40 53
7	32 67	2 62	35 29
8	37 79	2 62	40 41

Table II reveals (a) that for all of the samples analyzed the amount of Citric Acid in the U S P formula is insufficient, assuming, of course, that $\text{MgHC}_6\text{H}_5\text{O}_7$ and either $\text{K}_2\text{HC}_6\text{H}_5\text{O}_7$ or $\text{Na}_2\text{HC}_6\text{H}_5\text{O}_7$ are desired as reaction products, (b) that in some cases, *i e* (2, 3, 6 and 8), the insufficiency is quite appreciable

The results also assume NaHCO_3 and KHCO_3 as 100% pure, which, of course, is not true The totals are, therefore, close approximations No provision has been made for the slight amount of CaO

It would seem then that the formula for Solution of Magnesium Citrate should be more flexible, *i e*, provide for varying proportions of Citric Acid proportional to the MgO content of the Magnesium Carbonate used

It is well known that Solution of Magnesium Citrate precipitates upon standing As one chemist recently stated, "Some batches have stood up for three years, others have precipitated in three weeks"

Pasteurization at 60°C for one hour retards precipitation, but does not prevent it Possibly better dispersion is thus effected

It is logical to believe that when Magnesium Carbonate, high in MgO is used, precipitation will take place more quickly and in greater quantity

It would be good Pharmacy to first analyze the Magnesium Carbonate, calculate the amount of $\text{H}_3\text{C}_6\text{H}_5\text{O}_7 \cdot \text{H}_2\text{O}$ necessary, and then *q s* to a volume such that the preparation will contain just slightly more than 1.5 Gm MgO per 100 cc

A product more uniform from the standpoint of chemical composition (qualitatively and quantitatively) and physiological action would thus be obtained

A SUGGESTED FORMULA FOR WHITE LINIMENT *

BY LAWRENCE H. BALDINGER

From time to time different formulas have appeared in the pharmacy journals for a product known commonly as *White Liniment* This liniment should not be confused with *Linimentum Terebinthinæ Aceticum*, *N F V*, known also as *Linimentum Album* The *White Liniments* being manufactured by a number of pharmaceutical houses at present appear to be stable emulsions of fixed oils in which suitable stimulants and rubefacients have been dissolved

White Liniment is often prepared extemporaneously by the pharmacist according to the following formula

* Section on Practical Pharmacy and Dispensing, Washington meeting, 1934

Ammonia Water

Olive Oil

Oil of Turpentine, ññ, æquales partes

The resulting product, however, separates on standing, especially if the olive oil is neutral, and it has been suggested (1) that two drachms of oleic acid be added to make a non-separable mixture, and that camphor or opium may be added to enhance the value of the liniment Newman (2) has suggested a similar formula in which neatsfoot and cottonseed oils have been substituted for olive oil Other formulas (3), (4), (5), (6) which are more suitable in the preparation of a stock *White Liniment* include the following ingredients in varying amounts ammonium carbonate, camphor, oil of turpentine, oil of origanum, castile soap, soft soap, cottonseed oil and alcohol

In the preparation of *Ammonia Liniment*, *N F V*, which, for all practical purposes, is a *White Liniment* without some of the rubefacient ingredients, several suggestions have been made to insure a homogeneous and permanent emulsion of creamy consistency Raubenheimer's suggestions (7) have been adopted in part by the *N F V* Revision Committee in that sesame oil is used in *Ammonia Liniment* Latham (8) has proposed the use of paraffin oil, oleic acid and ammonia water as ingredients for *Ammonia Liniment*

White Liniment is essentially an oil-in-water emulsion, the emulsification being brought about by a small amount of ammonium soap in the mixture This soap is either added as such or is produced in the mixture by a reaction between the ammonia water and some fatty acid present in the fixed oil It is thus apparent, as pointed out by Kyser and Velbrandt (9), that a stable emulsion cannot be formed if the fixed oil is neutral or if no soap is added These authors have stated that as the percentage of fatty acid increases up to a certain point, the emulsion improves, but becomes too viscous when the fatty acid content is high They have recommended that fixed oils should be standardized with respect to percentage of free fatty acids Shulze (10) has also stated from observation that some free fatty acid in oils appears to be necessary for the preparation of emulsions

The "whiteness" of *White Liniment* is dependent upon the saponified fat present in the preparation, and upon the minuteness of the oil globules dispersed in the oil phase Without the use of a colloid mill or a homogenizer, it would be difficult to make a permanent, non-separating liniment It has been suggested (7), (11) that sufficient alcohol be added to reduce the density of the outer phase to that of the oil phase, or to use glycerin for increasing the viscosity of the emulsion Neither suggestion seems to have been adopted

A few years ago, the Carbide and Carbon Chemicals Corporation (12) introduced a new synthetic organic chemical, triethanolamine The commercial product is a colorless liquid of faintly ammoniacal odor and great hygroscopicity It is less alkaline than ammonia, not harmful to textiles, not caustic to the skin Recently the Council on Pharmacy and Chemistry of the American Medical Association (13) accepted for admission to New and Nonofficial Remedies triethanolamine-crude The report of the Council in part is as follows

'Triethanolamine-crude is an excellent emulsifying agent for use in the preparation of ointments and other dermatologic medicaments it combines with fatty acids to form soaps with

good detergent properties, which are soluble not only in water but also in gasoline, kerosene and oils. It is claimed to have the power of increasing the penetration of oily substances and to possess a certain amount of bacteriostatic action."

For the preparation of *White Liniment* the following formula was used. The amount of stimulants and rubifacients may be varied to suit the compounder.

WHITE LINIMENT

Cottonseed Oil	220 Gm
Oleic Acid	25 Gm
Triethanolamine	5 Gm
Camphor	9 Gm
Oil of Turpentine	40 cc
Stronger Ammonia Water	25 cc
Distilled Water <i>q s ad</i>	500 cc

To the cottonseed oil, in which is dissolved the camphor, add the oleic acid and triethanolamine, and stir vigorously, preferably with a motor stirrer. Add the oil of turpentine and continue stirring until the mixture is homogeneous. Then slowly add with constant stirring about one half the required amount of water. Stir until a thick creamy emulsion is formed. Add the stronger ammonia water and enough distilled water to complete the required volume.

This product may show a tendency to separate, particularly if diluted to a high degree with water. The product, however, can be restored to the original state by gentle shaking.

In an attempt to simplify the preparation of this product in small quantities the formula and procedure were modified slightly as follows. The camphor and cottonseed oil were replaced by an equal weight of *Camphor Liniment U S P*, and the ingredients were placed in a dry bottle and vigorously shaken to form the emulsion. The resulting product indicated that the bottle method is to be preferred in the preparation of smaller amounts of liniment.

CONCLUSION

1. Triethanolamine-crude, N N R, has been suggested as an emulsifying agent in the preparation of *White Liniment*.

2. Both the stirrer method and the bottle method have been proposed for making this emulsion.

REFERENCES

- (1) Anon, *Bulletin of Pharmacy*, 21, 526 (1907)
- (2) Newman, *Ibid*, 29, 136 (1915)
- (3) Anon, *National Druggist*, 54, 236 (1924)
- (4) Anon, *Bulletin of Pharmacy*, 21, 440 (1907)
- (5) Anon, *Ibid*, 29, 48, 538 (1915)
- (6) Anon, *Merck's Report*, 11, 69 (1901)
- (7) Raubenheimer, *Bulletin of Pharmacy*, 22, 391 (1908). Proceedings of the A. P. H. A. 56, 1030 (1908)
- (8) Latham, *Jour. A. P. H. A.*, 3, 234 (1914)
- (9) Kyser and Velbrandt, *Ibid*, 13, 433 (1924)
- (10) Schulze, *Apoth. Ztg.*, 46, 391 (1931)
- (11) Anon, *National Druggist*, 59, 68 (1929)
- (12) "Emulsions," The Carbide and Carbon Chemicals Corp. New York, July, 1933
- (13) New and Nonofficial Remedies, *J. A. M. A.*, 102, 537 (1934)

UNIVERSITY OF NOTRE DAME,
DEPARTMENT OF PHARMACY, NOTRE DAME, INDIANA

A NOTE ON OPEN PRESCRIPTION DEPARTMENTS *

J NORMAN SILSBY ¹

The present trend toward visible prescription departments is perhaps one of the most hopeful signs of the reawakening of Pharmacy's professional pride. It is beginning to realize that it has professional obligations to itself as well as to the physician and his patient.

Pharmacists are beginning to realize that a more professional atmosphere in the store goes far toward increasing his prestige and business.

It is hoped that the trend toward the visible prescription department becomes more wide-spread, but it is a move that must be considered carefully before it is undertaken.

As no two locations are identical the pharmacist must make his own decisions as to the probable advantages to be derived from an open department. The following are a few of the things he may do well to consider before making his decision.

As the primary object of the drug store is the filling of doctor's prescriptions, the opinion of the local physicians should be sought and their suggestions given serious thought. The good-will of the physician is one of the most potent factors in building a remunerative prescription practice and every effort should be made to secure his cooperation.

With this object in view the writer interviewed a number of our local physicians and they have been unanimous in their disapproval of a department in which it was possible to see the different ingredients that enter in the finished prescription.

At this point it would be well to add a word about the meaning of the term "visible prescription department." As the writer understands the term it means a department where the customer can see the top of the work-bench on which the prescription is being prepared and is able to follow every move the pharmacist makes and see the different ingredients that go to fill the prescription. Of course if the department is one in which the customer can only see the head and shoulders of the pharmacist, the following objections do not hold.

In the recent "Prescription Ingredient Survey" a tabulation of the number of ingredients in the average prescription showed that between 41.4% and 46.8% of all prescriptions studied contained only one ingredient and from 60% to 72.7% had no more than two ingredients. The average for all prescriptions studied was 2.29%.

It can readily be seen from this report that the filling of the greater number of prescriptions consists chiefly of pouring from one bottle to another, or possibly adding a salt to a liquid or mixing two liquids. Of course the care and ability necessary in compounding the ingredients in the first place does not enter into the consideration of the customer when he sees the actual filling of the prescription. Unless the patron understands this the natural reaction of the customer will be one of resentment toward the prescriber for giving him a prescription so simple in its ultimate composition. The fact that the customer can see the ingredients in his prescription is the chief objection of the doctor. The next objection presented by the doctors was the tendency toward self-medication.

Another point that must be considered is that if the prescription calls for "a

* Section on Practical Pharmacy and Dispensing, A. Ph. A., Washington meeting, 1935.

¹ Rutgers University School of Pharmacy, Newark, N. J.

poison" to be used internally and the customer sees the label, it may engender an unwarranted fear in his mind—for to him "a poison" is a poison in any quantity

Then again, every pharmacist has had the experience of a prescription "going wrong" and being forced to throw it away and start over again To the initiated this has no particular significance but to the patient it may mean that the pharmacist was either lacking in ability or was careless in his work

Of course, all of these factors may not enter into the consideration of those contemplating a change but the writer thinks they will all be well repaid if they interview their local physicians and give the other points careful thought before they make any changes In the larger stores, where the prescriptions are received at a desk and the customer is unable to identify his own prescription in process of being dispensed, none of these objections may be serious

As an alternative to the visible prescription department the writer offers the suggestion of a visible manufacturing department where the pharmacist can make up his pharmaceuticals Seeing a pharmacist making one of the various types of pharmaceuticals would show the patron that there is more to pharmacy than selling stamps or wrapping packages

THE PROFESSIONAL OUTLOOK *

BY L M KANTNER

Several months ago, a gentleman who is deeply interested in professional pharmacy asked my opinion regarding the future of pharmacy In reply I asked for his opinion on the subject Rather dolefully we both shook our heads

Somehow I am led to believe that the public appreciation of pharmacy has slumped We can remember the long rows of glass-stoppered and glass-labeled bottles that were first encountered upon entering the drug store of a generation ago The public really had a high appreciation of the professional phases of pharmacy in those days The stores themselves seemed to radiate confidence, respectability and balance

The change in the public reaction and the change in the drug stores are almost incredible when contrasted with the advances made in pharmacy as a whole The educational system has made vast improvement In earlier days, there were no legal requirements for pharmaceutical practice Later, a specified number of years of experience was required in addition to passing a state board examination High school training and college of pharmacy graduation came in due course Finally, the college course has been increased from two years to four In my opinion it can be truthfully said that pharmaceutical education is on a standard collegiate basis

These magnificent advances came in response to the efforts of those who appreciated and understood the importance of pharmacy and the need for placing it on a sound educational foundation It was accepted that to become a fully recognized profession sound educational training must be made a basic requirement

Later, there developed another class of individuals who saw an opportunity to commercialize the advances pharmacy was making professionally A deliberate

* Section on Practical Pharmacy and Dispensing, A Ph A Washington meeting, 1934

effort was made to exploit the standing of the drug store Pharmacy became the object of a heartless and ruthless attack

The dignified and thought-provoking shelf bottles gave way, in some stores, to bric-a-brac, cooking utensils, gardening tools, athletic supplies, canned foods, hardware and recently, hard liquor The soda fountain has developed a lunch and dinner service, carried on in the name of pharmacy

A few days ago a prominent woman said to me that the modern drug store was a most pitiful institution The conglomerate assortment of merchandise gives the store a hodge-podge location in the public mind It is difficult to think of professional practice in a lunch-room atmosphere One is not inclined to place a high estimate on persons who seem determined to place a low value on themselves There is no difficulty in understanding the public mind—it is an unavoidable reflection of the course of action followed by thousands of retail pharmacists

There is, however, no question that we have many high type drug stores, perhaps more than ever before These stores are conducted on an ethical basis, and by persons devoted to high professional principles Such stores are a credit to pharmacy, and are efficient in every respect

Some may claim that the professional and ethical type of pharmacy is not effected by the general merchandising type, that the higher the professional standing the less the store is concerned with purely commercial matters In my opinion this view is utterly unsound In the first place, no drug store, however professional it may be, can operate in an uneconomic style The general merchandising store really sets the pace They sell thousands of items, running into fabulous sums, in direct competition with the ethical store Many of these items are used as "loss leaders" with the result that every one must compete on the same basis or be out of the picture Many of the best selling preparations have been footballed so long that there is no price other than the predatory price This list includes antiseptics, toilet preparations, cod liver oil, mineral oils, chemicals, pharmaceuticals, articles for feminine hygiene and countless other items These general merchandising stores buy these articles frequently in enormous quantities, cut them to a predatory level and thus establish the conditions under which they are sold This state of affairs is largely responsible for the general public estimate that the present-day pharmacist is just another merchant

While the writer is inclined to judge the future for pharmacy as anything but bright, he believes that the near future will see more professional pharmacies and better pharmaceutical service will be extended the public There are several reasons for this The codes have attacked some unfair trade practices, and common-sense has raised the current level of many articles heretofore sold on a predatory basis Pharmaceutical legislation of the future is certain to be more aggressive The boards of pharmacy should be clothed with discretion when applications are made for new drug stores The sale of drugs and medicines should be restricted to pharmacists, and drug stores should conform their activities and classes of sales to reasonable limitations

My optimism is based upon my inherent feeling that pharmacy is an essential and responsible public health profession Will the public save it, if we fail to do so?

COOPERATION BETWEEN DENTISTS AND PHARMACISTS *

BY SAMUEL M GORDON ¹

Dentistry and pharmacy have a common purpose in caring for the public health. This may have been overlooked, probably because of the emphasis that has been given in the past to the restorative aspects of dentistry and because of certain trends in pharmacy, notably the stocking of many shelves with diverse nostrums. The present trend in dentistry is toward prevention, just as we are aware that there is a return to the professional prescription pharmacy, where the nostrum is not permitted to enter. To be sure, the operative and prosthetic aspects of dentistry will continue to absorb a large part of dental effort, even as orthopedic surgery, to choose but one example from the field of medicine, has not been entirely displaced by the new knowledge of nutrition.

The dental curriculum of to-day emphasizes the relationships of physiology, bacteriology, pathology, biochemistry and other basic sciences to the prevention and treatment of dental disease. The study of the action and uses of drugs occupies a fair proportion of the dental curriculum.

Drugs have been used for correcting and alleviating dental disorders from earliest times. Reference to the use of drugs for the relief of toothache is found in the earliest manuscripts. Drugs were used in the attempt to control dental caries in the earliest practice of dentistry. Large amounts of plant and mineral astringents were used in the treatment of diseases of the gums. The dental profession is associated with the discovery of the anesthetic properties of ether and nitrous oxide, through Morton and Wells. Dentists were instrumental in large measure for examining clinically the local anesthetic properties of cocaine and the numerous synthetics related to it. It is estimated that the greater part of all the procaine, and a large amount of epinephrine, manufactured, is now used by dentists.

Dental surgeons treat pathological conditions of the soft and hard tissues of the oral cavity and closely adjacent areas. In the practice of oral surgery and in the routine practice of dentistry, large amounts of general and local anesthetic agents, germicides, analgesics, hypnotics, hemostatics and other classes of drugs are used.

With the appreciation that dental caries is related in some way to the problem of calcium supply and deposition, the dentist prescribes and is being urged to recommend preparations containing calcium and phosphorus, as well as various vitamin containing preparations ². One cannot speak of calcification or the laying down of bone, dentine or enamel, without at least mentioning the endocrine system, and particularly the parathyroid and its function in calcium deposition. Investigations on record, confirmed and unconfirmed, point to an interplay of other glandular secretions ³.

* Section on Education and Legislation, A. P. H. A., Washington meeting, 1934.

¹ Secretary, Council on Dental Therapeutics of the American Dental Association.

² "Diet and the Teeth," Report of the Council on Dental Therapeutics, *J. A. D. A.*, 19, 1843 (October 1932).

³ "Endocrines and Teeth," Report of the Council on Dental Therapeutics, *Ibid.*, 21, 322 (February 1934).

These points are cited to illustrate the classes of drugs that dentists may be called upon to prescribe, recommend or to advise upon. As far as I am aware from the various state dental practice acts, there are no restrictions on the prescribing or uses of drugs by dentists, other than those that apply to physicians of the regular schools.

Many *clinical* samples are sent to dentists by manufacturers of all kinds, good and bad. The purpose behind the generosity is palpable. The senders do not expect a clinical test in the fine sense of that term. Is it not reasonable to expect that they hope the package will be used and displayed in such a way that the patient remembers the name after he leaves the office, so that it may be purchased without the immediate advice of his medical adviser for similar or other conditions that may arise after his office visit? Here the drug stores also assume part of the blame for counter prescribing.

Contrary, undoubtedly, to the desire of the manufacturers of some pernicious proprietary articles, who would have the dentist serve as his advertising agent, it is gratifying to know that since the inception of the Bureau of Chemistry and the Council on Dental Therapeutics of the American Dental Association, the dental profession by far and large, are protesting these evil practices and supporting the interests of legitimate therapy, as exposed in the reports of the Council which have been appearing in the *Journal of the American Dental Association* in the past five years.

The Council on Dental Therapeutics has been pointing out to dentists the imposition practiced on them and on their patients by patent medicine exploiters parading in the more respectable guise of medicine manufacturers. It need surprise no one acquainted with the work of the Council on Pharmacy and Chemistry that similar conditions exist in the dental profession. Here are just a few of the findings. Two-thirds of a fluidounce of a pyorrhea cure, which sold for ten dollars, was found to be forty per cent sulphuric acid. Another guaranteed cure for pyorrhea, bleeding gums and all the other indefinite expressions linked in the exploiter's literature, under the term pyorrhea, sold for ten dollars for a half pound. This contained pumice, 90 per cent, and alum, 10 per cent. A tablet under the name of Anacin, which, on the whole was a variation of the well-known A P C mixture, was sold through the unwitting advertising of dentists who accepted and passed out the "clinical" samples. The "newest local anesthetic" was found to be a mixture of benzyl alcohol and chloroform. Neu-Ora claimed to be a non-toxic topical anesthetic was found to contain 15 per cent of cocaine. Vlemnick's solution was redressed in a therapeutically suggestive name and sold to dentists at an exorbitant price as a pyorrhea cure. These cases can be multiplied endlessly, and their use defeats the aims both of dentistry and pharmacy.

HOW THE DENTAL ASSOCIATION IS MEETING THE PROBLEM

The work of the Council alluded to briefly has made dentists appreciate that the interests of their patients in this respect can be fully served only by prescribing drugs not on the alluring appeals framed in some advertising office but on an intelligent understanding and use of such drugs, as the individual needs of the patient require. This connotes an understanding of the composition, actions and claims of the drugs. It is gratifying to note that dentists are beginning to ap-

preciate the importance of a wide usage of official drugs and preparations made therefrom as against non-acceptable unofficial drugs

The term "official drug" is well understood but neither the interests of dentistry or pharmacists are advanced if one puts out a mixture of several official drugs and puts them out under a non-informing name. This is a practice that deserves to be discouraged. This is being discouraged on our part by encouraging the dentist to make greater use of the official drugs, and to avail himself of the service of competent pharmacists. Progress depends on an understanding of the problem at hand. To accelerate this progress, the Council's work has, of necessity, fallen into several categories. It accepts those articles that conform to a printed set of rules. These rules relate to composition, tests for identity and purity, advertising to the public and advertising to the profession, therapeutic claims, naming of articles and rationality of mixtures. It will be at once recognized that these rules are essentially those of the Council on Pharmacy and Chemistry of the American Medical Association. Their value to the medical profession and to the public have been amply demonstrated in the past twenty-five years. Inasmuch as dentifrices present a somewhat different problem, the Council has published a separate set of provisions. Dentifrices are acceptable if, among other things, they are advertised solely as an aid to the tooth brush in cleansing the teeth. The list *Accepted Dental Remedies* now carries reference to 166 proprietary articles and many official articles, but more of this later.

With the aid of the A. D. A. Bureau of Chemistry, the Council examines proprietary articles on the market for their compliance with the rules. Many of the articles already examined are those of secret composition and advertised with claims which are palpably false or unwarranted. This constitutes a large part of the work. Reports discussing the unacceptability of these products appear in the *Journal of the American Dental Association* from time to time.

A further appreciation of wider problems in dental therapeutics is given readers of the *Journal* through a series of reports on the general subject of pharmacology and therapeutics. These general articles are prepared by members of the Council or by outsiders who are invited by the Council for their special knowledge in separate fields. By way of illustration, some of the titles of articles which have already appeared are "Causes and Treatment of Systemic Reactions in Local Anesthesia," "Endocrines and Teeth," "Glycerin in Toothpastes," "Mouth Washes," "Pre-Medication and Post-Medication for Dentists and Oral Surgeons," "Scientific and Rational Therapeutics—Its Effect on Dental Progress," "Stock Solutions and Mixtures for Local Anesthesia," "Uses and Abuses of Barbitals," "Uses of Pain Relievers in Fixed Proportions by Dentists."

In addition thousands of inquiries from dentists are answered every year on various official and nonofficial products.

ACCEPTED DENTAL REMEDIES

It is sometimes amusing, if not tragic, to meet pharmacists of all shades who have the impression that dentists do not prescribe beyond mouth washes and dentifrices. Let it be said at the outset that dentifrices and mouth washes are an extremely negligible part of the dentist's interest in materia medica. As a matter

of fact, the Council considers the ordinary run of mouth washes as no more useful than the use of talcum powder after shaving

It was suggested above that the Council includes acceptable proprietary drugs in a list designated as *Accepted Dental Remedies*. The list, which will soon appear in book form, includes not only these acceptable proprietary articles but also information on useful official drugs and preparations¹. The inspiration for this little volume has come from "New and Nonofficial Remedies" of the Council on Pharmacy and Chemistry and "Useful Drugs" of the American Medical Association. The information, however, is devised for the members of the dental profession. Preliminary estimates indicate that this little volume will be required or recommended in almost all of the dental schools of the country. It should also have an interest for pharmacists as a point of contact with the dental profession.

In addition to the drugs listed therein, there will be appendices on metrology, solubility of drugs, symptoms and treatment of poisoning, therapeutic indices, and so forth. As an indication of the character of the drugs included, the following selected classes, taken from one of the indices of the book, may be useful.

General Anesthetics—Nitrous oxide, ether, chloroform, ethylene, ethyl chloride, etc

Local Anesthetics—Cocaine, procaine, butyn, apothesine, tutocaine and their various recipes

Drugs Acting on the Central Nervous System—Strychnine, atropine, morphine, caffeine and a wide variety of hypnotics and anodynes or analgesics, such as barbitals, acetamid, acetphenetidin, acetylsalicylic acid, codeine, etc

Drugs Acting on the Circulation—Epinephrine, nitrites, etc

Drugs acting on the alimentary canal, and a large class of drugs of purely local action such as astringents, styptics, antiseptics, germicides, etc

The extent of the list should surprise no one when consideration is given to the relatively wide field in which the dentist works and the appreciation that has come in the last decades of the relation between the mouth and cognate apparatus and the rest of the human body.

It is not my intention to bore you with formulas or recipes. They may be obtained from many textbooks and other sources². The important point is for pharmacists to acquaint themselves with the demands of the dentists and supply them. These products will range from such simple and innocuous products like dentifrices and non-medicated mouth washes to such agents as are used for the treatment of pyorrhea, trench mouth and the more involved surgical manipulations of dentistry.

HOW PHARMACY CAN MEET THE PROBLEM

Millions are spent yearly to advertise proprietary products to the dental profession. The advertising manager of one of the better pharmaceutical houses has pointed out that recommendations by dentists have started many an unknown proprietary on the road to fortune. Those worthy of the dentist's attention will

¹ Now available from American Dental Association. All dental schools with few exceptions make use of the book.

² Recent articles of interest in this connection are Blass, J. Lewis, Ph G., D D S. "Medicinal Aids in General Dentistry," *Dental Cosmos*, 76, 239 (February 1934).

Agüer, James E. Ph G., D D S., "Dental Medicines. Modern Pharmacologic and Therapeutic Principles Applied to Their Use in General Practice" *Dental Cosmos*, 75, 1184 (December 1933).

be in *Accepted Dental Remedies*, and no doubt will be available from pharmacies. No dental journal which goes to dentists engaged in the general practice of dentistry censors its advertising on a published basis except the *Journal of the American Dental Association*. Some of these journals are sent gratis to dentists. The circulation cost is defrayed by dental supply houses. In these journals may be found advertised the old well-known mixtures, clothed in fancy and appealing names, foreign to the nomenclature of the Pharmacopœia. *Apropos* of this, the late Professor Puckner of the Council on Pharmacy and Chemistry has aptly pointed out that if a law were enacted to oblige manufacturers to sell medicinal products under a properly descriptive name or make it illegal for a dentist or physician to use or prescribe them, the use of most proprietary remedies would be discontinued and successful newcomers might each year be counted on the fingers of one hand.

This multiplication of trade names for well-known preparations is used to disparage the well-known and useful preparations, and the assumed advantages of the new mixtures are extolled. For example, procaine base has been known to chemists, physicians and dentists for many years. Its pharmacologic properties were well worked out by Gros in 1910, and confirmed by Sollmann and others since then. Recently there has come on the market, primarily to dentists, the same procaine base in lanolin, and other non-essential ingredients, and heralded to the dentist with the following statements:

There has been a continuous search, since Koller's use of cocaine in 1884, for a drug to be used as a topical anesthetic, possessing the ability to penetrate mucous membranes, yet having low toxicity."

There are available in the Pharmacopœia, several drugs of proven usefulness for topical anesthesia, even considering the limitations of this form of anesthesia, such as benzocain, ethyl chloride, cocaine and others.

In the treatment of trench mouth, besides his operative technique, the dentist uses a wide variety of drugs, ranging from escharotics, such as chromic acid, to milder drugs like sodium perborate, and even salt solutions. In between these two extremes are found occasionally the use of mercuric chloride, hydrogen peroxide, bismuth compounds and the organic arsenicals. It is desirable that arsenicals and other unstable preparations be freshly prepared. Hence there is no rational reason why the pharmacist should not acquaint the dentist how he can furnish these preparations at a greatly reduced cost and moreover on a basis that more fully benefits both.

An incident will illustrate the benefits of intelligent cooperation. Sometime ago a dentist who had been having post-operative difficulty with the stock solution of a local anesthetic that he had been using invited my assistance. The matter was discussed with the result that a method was worked out whereby he could prepare his own solutions of procaine and epinephrine in an alkaline medium. This has been a little over a year ago. This particular dentist is highly pleased not alone with the fact that he has been able to affect a considerable saving, but more importantly, the feeling that his patients are more comfortable. Furthermore there is a sense of accomplishment and prestige that comes from knowing in detail the preparation of the material he was injecting into his patient, rather than depending on semi-secret preparations as he had been in the custom of using. This is not an isolated case. Such examples may be cited over and over again.

In the course of his practice, a dentist uses many hypnotics and analgesics. Unfortunately in the past he has been an unwitting salesman for the shot-gun mixtures so long disparaged by students of the problem. The extent of his prescribing was reached when he handed out a package with two or three tablets, but the package bore the name, in large type, and directions that invited self-medication for real or imaginary ills foreign to the purpose of the case. There is a legitimate field of interest between pharmacy and dentistry in this respect, since many dentists write prescriptions for drugs for the relief of pre- and post-operative pain. But the system is not as general as it should be. Some dentists are reluctant to write prescriptions, because of the economic aspect. If they wish their patients to have a limited number of doses, let us say of an hypnotic, they find the cost unnecessarily high. Hence they carry in their own medicine cabinets a stock for dispensing. This should by no means be discouraging to pharmacists, but should rather be seized as an opportunity. It is well known that the mode of administration is an important factor in drug action. Sometimes a cachet or a capsule may be preferable to the compressed or the triturated tablet. The situation is somewhat analogous to the use of drugs by ophthalmologists and other medical specialists. The oculist does not write a prescription for each dose of atropine he uses for mydriasis. Yet the filling of this class of prescription is a point of pride with many professional pharmacies.

Despite the successful operation of many pharmacies, meeting the highest requirements of scientific dispensing, the dentist still obtains his drugs from other sources, and to his economic disparagement and sometimes as already indicated to the unwitting abuse of his patient. For example, Eugenol sold under another name sells for ten times its real cost. Preparations essentially zinc oxide, used by dentists for so-called pulp capping, are purchased by dentists at the rate of seventy-two dollars for a pound. The pharmacist can sell C P zinc oxide at one dollar a pound and yet make more than a fair profit.

The Council has pointed out that mouth washes are of little or no value in the treatment of dental disease. Yet their limited usefulness is recognized because of the pleasant feeling they leave after operative procedures. Without becoming involved in details, Dean Schicks has rendered a useful service by placing on record certain mouth washes of open composition. These can be detailed by pharmacists to dentists at a reasonable cost.

Aside from personal solicitation which should always be employed wherever possible, the pharmacist may acquaint himself with the needs of dentists by following regularly the reports of the Council on Dental Therapeutics which appear in the *Journal of the American Dental Association*, and particularly to acquaint themselves with the material in the little book, "Accepted Dental Remedies," about to be published. The descriptions in this volume will, on the whole, be free of recipes and here the pharmacist can assist the dentist by acquainting him with the most advantageous pharmaceutical use of the various useful drugs.

Professor Schicks of Rutgers University School of Pharmacy must be regarded as a pioneer among pharmacists in bringing together both groups. The circumstance that several meetings of the American Association of Colleges of Pharmacy have been devoted to the prescription requirements of dentists is an omen for success. Further it is a source of encouragement to know of the meetings of local

dentists with members of Professor Schicks' school. This is a phase of the work that should be fostered by more schools of pharmacy, pharmacy associations and dentists. Professor Schicks' experience indicates that dentists will welcome such efforts. It appears that the schools of pharmacy and dentistry of the same university can find common meeting ground.

Just as advertisers find it profitable to spend millions in the attempt to make dentists proprietary-minded conscious, pharmacists can work to make dentists pharmacopœial conscious. Any effort of this kind that draws its inspiration from the ideals of both professions cannot help but benefit the public for whom both professions aim to serve.

THE PLACE OF A FIELD REPRESENTATIVE IN COOPERATIVE PROFESSIONAL ADVERTISING *

BY L. WAIT RISING

This era of economic decadence is witnessing the rebirth of professional pharmacy. There was a time, not so many years ago, when such a movement could only be predicted, and that with some hesitancy. But the competitive scramble in low-priced drug sundries brought on by the period of depression has changed prediction to actuality. Pharmacy is going professional. Even now a sufficiently large percentage of the existing drug stores are being made over, or will be shortly, into pharmacies with true professional ideals and methods of doing business which warrant the setting up of a new classification to take care of them. While they were the exception rather than the rule, their very minority made apparent the uselessness of dealing with them as a group.

However, this has changed. When speaking of pharmacies to-day we must differentiate between two kinds. The merchandising establishment of the "corner drug store" variety, and the prescription pharmacy, which, while no less a merchandising unit in its way, is not considered as a true retail store by the laity.

This amounts to a division of trade, and brings with it not a division but a whole new set of merchandising principles and problems that apply only to the prescription pharmacy. One of the latter is advertising. It is trite to say that a professional pharmacy cannot advertise in the same manner as the ordinary retail store. Its appeal must be both dignified and restricted and it must be directed at the physician as much or more than at the general public. Many drug stores conduct a profitable business without physician cooperation, the lack of which would quickly throttle the prescription pharmacies.

What then are the best advertising methods for securing this necessary professional friendship? Indirect contact through the mails is good and is a means of reaching the doctor periodically which is open to every pharmacist. There is no limit to the number of physicians one pharmacist can reach in this way nor to the number of times such contact can be made. A mail campaign will serve to focus some attention on the organization conducting it.

A second and perhaps the ideal way to attract professional patronage, especially if it be combined with a mail campaign, is by frequent personal contact with the

* Section on Practical Pharmacy and Dispensing, A. P. H. A., Washington meeting, 1934

physicians whose business is being sought By this means alone can the pharmacist obtain the full measure of value for his advertising effort To interview a physician is to be given the fullest opportunity to convince him of the merits of the pharmacy in question There is no chance for him to throw away unnoticed advertising of this nature It cannot be tabled to be perused some other time, only to be forgotten completely The story of the pharmacist is put across right then And if it is interestingly presented, there will be questions to answer that mean openings for other messages perhaps unrelated to the subject upon which it was first intended to interview the doctor, but none-the-less valuable Through these conversations the deeper medical interests of the physician can be learned, the special pharmaceutical and therapeutic services which he would like rendered him can be ascertained It is obvious without pointing out other advantages accruing both to the physician and the pharmacist from these periodic visits to the office of the former, that a mutually beneficial cooperative relationship can be established as a direct result

Just how near the actual results obtained by this contact advertising approach the theoretical total possible to achieve will depend primarily on the man making the contacts The pharmacy being represented must measure up in full to all that is claimed for it, but the fact that it does is of secondary importance when we consider the factor most responsible for the ultimate success of a personal contact campaign Given two establishments possessing equal physical equipment, the one with the better contact man will attract more than half the professional business In other words, inanimate advertising assets such as superior facilities are not worth as much to a business as the men who go out and tell about them

Not all pharmacists are equally good at the telling A large number of excellent pharmacists are unable to compete satisfactorily in a serious program of selling their organizations through personal calls Figuratively speaking, they are forced to hide their lights under a bushel That is poor economics It gives all the advantage to the pharmacy possessing poorer equipment but having a better personality in representing it to the medical profession

There is, however, a way to offset this disadvantage and to obtain the proper kind of representation, especially in the more thickly settled localities It is one that has been tried before but with no wide acceptance following its use This lack of acclaim probably resulted from certain difficulties which will be pointed out later If, therefore, a simple alteration or complete removal of one or two inhibitory influences would rehabilitate an old, indifferently successful contact system, the plan certainly merits review

The method is fundamentally this In any community where there are a number of drug stores, let those which place a premium on the professional business cooperate in a common advertising program which can be supplemented by the individual organizations as they see fit The stores would, of course, be carefully chosen The proper choice of the pharmacies participating is vital Proximity of location which means competition is not of such importance as the caliber of the various units of the organization When a miscellaneous group is represented, there will always be one or more which by bad precept or example destroy the faith of the physicians in the entire membership This has been forcibly demonstrated when pharmaceutical associations have attempted personal visitation work Care-

ful selection of the participating stores eliminates that disadvantage and also eliminates inefficient direction of the campaign

The stores so united would pool the bulk of their advertising funds, thus obtaining a fair-sized treasury. The sum made available would vary, depending on the number of stores cooperating and the average annual allowance they set aside for advertising purposes, but the minimum would scarcely be less than \$2400.00

With this budget, the group is now able to hire a full-time field representative whose chief duty will be to make office contacts with the physicians. The salary that can be paid for this work would be sufficiently large to attract men of excellent training and who possess distinct capabilities for the task in hand. This means that each of the cooperating pharmacists can now have as a part-time member of their staffs, a man more able in personal contact or detail work than themselves. This man is to be considered as only a part-time member of the individual staffs, because he is working specifically as an emissary of each pharmacy only when he is calling on the doctors designated by that pharmacy as the ones it particularly wants approached.

Two major results are immediately achieved. The pharmacists are assured of the most efficient representation among the men from whence their business springs. This major advertising problem solved, they now have more time for other important details of business.

The messages to be carried by the field representative to the physicians will naturally be influenced by many factors, but their objectives will always be the same—namely, selling the professional services and personalities of the pharmacies combining in the advertising effort. By this method the physicians in a given locality are constantly being reminded by pleasant contact with a personal representative of Blank's pharmacy that it can best serve their needs. And because the proper kind of man is doing the detailing, the doctors have a person upon whom they can rely for valuable assistance with both pharmaceutical and therapeutic problems. For this reason alone they will always be glad to see him and more than willing to place considerable confidence in the pharmacies he represents.

In addition to his worth as a personal contact man, the field representative can earn his money in other ways. Because he is constantly meeting and studying a hundred or more doctors, his advice is invaluable in building up and coordinating advertising campaigns to be carried on by the individual units of the organization during the intervals between his visits to the physicians with whom they specifically requested to contact. He can in this fashion gear the minor advertising efforts to a higher degree of efficiency. By watching the prescribing tendencies of his doctors, he can assist materially in shifting slow prescription stock to places where it will move more quickly. Even in the matter of developing a fair pricing system for prescriptions his advice will be helpful. These suggest just a few of the ways in which a field representative having a knowledge of the problems and an interest in a number of professional pharmacies can more than pay his way.

It may be said with considerable truth that any pharmacy can, by using its regular staff, obtain for itself the personal contacts, carry on other advertising efforts, and do any number of other things calculated to build better professional relations and increase professional business. But the point is—how many of them

will do it without some organization such as has been suggested? This furnishes the stimulus which is all too often needed to galvanize individual initiative into full action

"PATENT MEDICINES"*

BY J HAMPTON HOCH

Down the street the flaming neon sign casts its ruddy lure—"Cut-Rate Patent Medicines" Cut-rate they may be, but are they patent medicines? Nostrums of proprietary origin having registered and protected names are called "patent medicines" but, in the legal sense of the word, a patent medicine is one whose composition or method of preparation or both has been patented and is not a secret because these facts appear in the patent specifications and become public property at the end of seventeen years. The distinction between a patent and a proprietary medicine, as these terms are generally used to-day, was non-existent three hundred years ago when preparations of this type originated.

Back in 17th century England, a year before Charles I ascended the throne, the "Arcanum Goddardianum," more familiarly called Goddard's Drops, was patented. This first patent medicine acquired such a wide reputation as a specific for epilepsy that Charles II, thinking to benefit humanity by making the formula accessible, purchased the secret of its preparation from Dr Goddard for 1500 pounds. And therefore it was also called "King Charles' Drops" or simply the "King's Drops" or, later, "Royal English Drops" and "English Drops." Spirit of human skull and opium, for these were the ingredients, sound revolting even for such a dread affliction as the "falling sickness," but, then, strong stomachs had our fathers of old.

The fact that Jonathan Goddard obtained a purchaser with a copious pocket undoubtedly stimulated the appearance of the many nostrums and proprietaries which followed this first one. Advertisements in the press reveal the wide distribution of trades which adopted proprietary remedies as side-lines—stationers, book-sellers, tinsmiths, hosiers—all bent on selling this "sovereign cure" or "effectual remedy" and that "established medicine" which is to be had "no where else." And frequently the public was warned against imitators.

The English settlers who migrated to these shores demanded those remedies with which they were familiar in the old country and it was not long before the news-sheets of America advertised the same preparations in the same way, all of which probably made the "cover to cover" reader feel quite as if he were back in England.

Among the better known proprietaries of the 17th century which were advertised in the early newspapers of the Southern Colonies and set forth in glowing terms to the credulous reader we find Anderson's Scots' Pills, Dutch Drops, Daffy's Elixir, Lockyer's Pills and Stoughton's Elixir.

ANDERSON'S PILLS

The originator of this proprietary was a Scotch physician, Dr Patrick Anderson, who claimed to have obtained the formula in Venice. The actual formula has been disputed for a long

* Section on Historical Pharmacy, A. P. H. A., Washington meeting, 1934

time, but contained Barbadoes aloe as its main constituent along with jalap and oil of anise. Various published formulas note soap, ivory black, colocynth, gamboge, black hellebore, potassium subcarbonate, and syrup of buckthorn as excipients or additional constituents. The pills were 3 or 4 grains in weight and sold for 1 shilling the box.

After Anderson's death his daughter made and sold the pills, subsequently passing to Thomas Weir of Edinburgh the right of manufacture. Weir obtained a patent on them in 1687. In the early part of the next century Mrs. Isabella Inghish (or English), then the proprietress, explained how the genuine product was to be recognized: "The true Pills have their Boxes seal'd on the Top (in black Wax) with a Lion Rampant, and 3 Mallets Argent, Dr. Anderson's Head betwixt I I with his Name round it, and Isabella Inghish underneath, the Shield in a Scroll."

DUTCH DROPS

This proprietary, first made in Haarlem in 1672, had as its basis the residue left in the redistillation of oil of turpentine. To this red, viscid and resinous matter (called Balsam of Turpentine) was added spirit of nitrous ether, tincture of guaiac and small portions of oil of amber and oil of cloves.

Two and a half centuries have rolled over the sands of time without obliterating this preparation, which is certainly noteworthy for its longevity. Dutch Drops were originally sold for half a guinea a bottle and are said to have netted the proprietors handsome returns.

DAFFY'S ELIXIR

This compound like all the more popular proprietaries was widely counterfeited and there are several formulas for its preparation. Anthony Daffy, "Student in Physick," was probably the originator, and in a pamphlet of 1673, "Elixir Salutis the choise drink of health or Health Bringing Drink," he lauds his "Secret" as "far beyond any Medicament yet known." Following Daffy's death (1750), his widow continued the business. Later, Mrs. Mary Swinton, "niece and executrix of Anthony Daffy and wife of Dr. Peter Swinton, who has prepared and in her name sold the true Daffy's Elixir," charged 6 shillings for a pint bottle. The Swinton formula called for Jalap, 3 lb., Senna, 2 oz., Coriander Seed, Aniseed, Liquorice Root and Elecampane, of each 4 oz., Spirit of Wine and Water, of each a gallon. The Tinctura Sennæ Compositæ of the British Pharmacopœia is a lineal descendent of this old proprietary.

LOCKYER'S PILLS

The vainglorious Lionel Lockyer used his tomb to advertise his most Excellent Pills called *Pillulæ Radijs Solis Extractæ*. The magniloquent epitaph in the Cathedral of St. Saviour, Southwark reads:

"Here Lockyer lies interr'd enough his name
Speakes one, hath few competitors in fame
A name soe Greate soe Generalle may scorne
Inscriptions w'h doe vulgar tombs adorne,
A diminution 'tis to write in verse
His eulogies, w'h most mens' mouths rehearse
His virtues and his PILLS are soe well known
That envy can't confine them under stone
But they'l survive his dust and not expire
Till all things else at th' universall fire
This verse is lost his Pill embalmes him safe
To future times with out an Epitaph"

Although disclaiming the use of "turpeth mmerale," "the sulphur of antimony" or "crude mercury" in his pills, Lockyer did not divulge its composition or method of preparation. The dose of this "Universall Medicine" seems to have been somewhat flexible since four were "a good ordinary Dose, the which contains some six Grains." Each tin of pills was "Lapt up in Papers" and bore the signatures of the proprietors "and Sealed at one end with the Doctor's Coat of Arms, being Three Boars Heads." A four-shilling box contained "above One hundred Pills (sometimes

more and sometimes less, according as they are in bigness)," for two shillings one received "about Fifty in the Half-Box " Accuracy and pharmaceutic elegance were evidently not a *sine qua non*

An early 18th century dispensatory which purports to give the basis of Lockyer's Pill directs "Panacea of Antimony, 4 parts, Opium, 1½ parts, Extract of black Hellebore, 3 parts "

These pills were vaunted as a cure-all in the broadest sense of the term, *viz*

'Falling-Sickness, Frenzy, Vertigo, Rheums or Defluxions, Head ach of all Kinds, Convulsion Fits, Difficulty of Breathing, Stoppage of the Stomach, Cough, Tisick, Inflammation of the Lungs, Consumption, Want of Appetite, bad Digestion, Pain in the Stomach, Worms of all Kinds, Colick, Inflammations and Obstructions of the Liver, Corruption, Putrefaction of the Blood, Jaundies, Black and Yellow, Dropsie or Tympany, Hard Swellings, Pain and Inflammations of the Spleen, Overflowing of the Gall, Trembling of the Heart, Swoonings, Stoppage and Scalding of Urine, Bloody-Flux, Gravel and Stone in the Reins and Bladder, Rickets, King's Evil Tumours and Hard Swellings, and Ulcers on the Body, Leprosie, Scurvy, Scab, Itch, the Gonorrhoea or Running of the Reins, the Pox, the Gout, Violent and Hectick Fevers, Agues, Green-Sickness, Fits of the Mother, Stoppage of Terms, restores Radical Moisture, cleanses and strengthens the Spermatic Vessels, increases and animates the Seed in both Sexes, fortifies the Womb preserves the Embryo, strengthens the Child, prevents Miscarriage, restores the lost Delight of Nature and absolutely cures all Barrenness curable by Medicine, Antidote against all Contagious Airs and Infectious Diseases, and perfectly resists all Foulness and Infection in the Act of Generation, mundifies and cleanses the Skin, restores and increases Beauty, makes Old Age Comely and Beautiful and the Countenance of all to be Cheerful and Sanguine "

STOUGHTON'S ELIXIR STOMACHICUM

"Poplicola" writing in the *Gentleman's Magazine* for August 1748, says "By nostrums I mean such medicines as are kept a secret for the use of the proprietors, though advertised for the benefit of the public " Then, indeed, Richard Stoughton's preparation certainly qualifies, for he was cunning enough not to be too exact in his patent specifications (thereby keeping his secret) and his "bitters" were not lacking in the public notices

The patent grant from Queen Anne to 'our trusty and well-beloved Richard Stoughton, Apothecary" is dated 1712, but the "Unicorn, in Southwark" saw many bottles of "Stoughton's Drops" or "Stoughton's Cordial Elixir" sold at 1 shilling, years before the patent was issued Perhaps the only reason for obtaining a patent was to warn off the bolder counterfeiters

Many other "patents," some of greater and some of less renown, are to be found mentioned in the columns of the early news-sheets of the American Colonies Godfrey's Cordial, Freeman's Elixir, Squire's Elixir, Bateman's Drops, Turlington's Balsam of Life, James' Powder, Hooper's Pills, Schwanberg's Liquid Shell, Dr Ward's White Drops, Misaubius' Pills, Eaton's Styptic

Time has seen most of these preparations interred in the therapeutic graveyard, but here and there one has survived, if in a somewhat modified form, and has won through to a wider field of usefulness in our official standards

WISCONSIN PHARMACEUTICAL ASSOCIATION

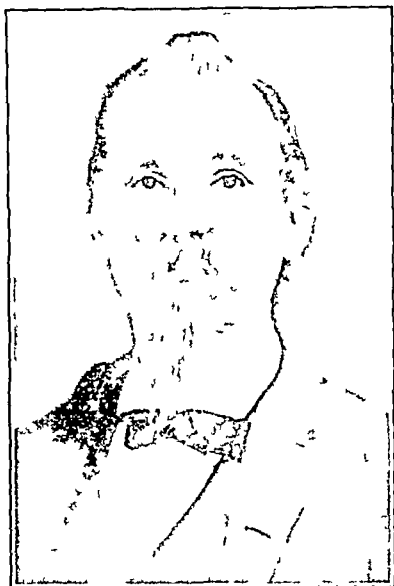
The Wisconsin Pharmaceutical Association will hold a one day meeting at the Park Hotel Madison, February 27th The purpose of this meeting is to do important legislative work and to have a business session to take up such other matters as may be important Legislative subjects which will be discussed are

- 1 The proposed Wisconsin Fair Trade Act commonly called the Junior Capper-Kelly Bill
- 2 Suggested changes in pharmacy laws
- 3 Retention of medicinal liquor permit
- 4 Peddlers' Ordinance for local communities
- 5 State narcotic legislation as requested by United States Commissioner of Narcotics

EMINENT AMERICAN PHARMACOGNOSISTS OF THE
NINETEENTH CENTURY *

BY HEBER W YOUNGKEN

In approaching this topic I am at once confronted with the problem of scope. Shall I record in this humble historical effort the life and work of all of the pharmacognosists who have risen to eminence in America and whose earthly activities began during the Nineteenth Century or shall I limit the field of my theme to those of that distinguished number whose labors have ended but whose souls abide with us? I have chosen the latter course as more appropriate at this time, being duly mindful of the outstanding work and worth of the others who are still living but whose labors for the advancement of science have not ceased



JOHN M. MAISCH

JOHN M. MAISCH (1831-1893)

The pioneer in American pharmacognosy was undoubtedly John Michael Maisch, son of a German merchant, who was born at Hanau on the Main on January 30, 1831. After a brief period of education in a private school and later in a city school, he determined to enter the jewelry business when a little more than twelve years of age. While pursuing his apprenticeship he took instruction in the Realschule and Oberrealschule and soon evinced interest in botany, zoology and theology. He early conceived the idea of the union of religion and science and was encouraged to prepare for the university by his teachers. During this preparation he took chemistry under Professor Bromeis and became so interested in the

natural sciences that he gave up the idea of the ministry. He had so overexerted himself through the study of the dead languages and other preparatory subjects that his health failed and his university plans were abandoned.

In 1849 Maisch came to America. He was almost penniless when he arrived in Baltimore and, in order to supply the necessities of life, obtained work for about six months in a paper box factory. While there he met a Dr. Wiss who, in 1850, opened a drug store and hired young Maisch as his assistant. Maisch was very ambitious and eagerly sought instruction from Dr. Wiss and Dr. Vogler, making constant use of Dr. Wiss' pharmaceutical books during his spare time. The store was sold in 1851 and young Maisch obtained work in another drug store in Washington until 1853. From 1853-1855 he worked in drug stores in Philadelphia and New York and in a chemical establishment in Brooklyn.

In 1856 he returned to Philadelphia to accept employment as clerk for E. B.

* Section on Historical Pharmacy, A. P. H. A., Madison meeting, 1934

Garrigues and Robert Shoemaker and Company, positions he held until 1859. He then was called to teach in Professor Parrish's School of Pharmacy at 8th and Arch Streets.

In 1861 he accepted the call to the chair of Pharmacy and Materia Medica in the College of Pharmacy of the City of New York which he occupied for two years, working during his spare time in the laboratory of E. R. Squibb.

The Civil War was on and Maisch was called in 1863 to organize and conduct the United States Army Laboratory at Philadelphia becoming director thereof until the end of the war.

After the close of the war he conducted a drug store at 1607 Ridge Avenue, Philadelphia, until 1871 when he sold it to give his entire time to teaching and the secretaryship of the AMERICAN PHARMACEUTICAL ASSOCIATION.

In 1866, Professor Maisch was elected to the chair of Pharmacy at the Philadelphia College of Pharmacy, succeeding William Procter, Jr. The following year he exchanged chairs with Professor Parrish by mutual consent and the title of the chair was changed to Materia Medica and Botany. This chair Maisch retained for 26 years, or until the time of his death. As a teacher he impressed his strong personality upon all whose fortune it was to sit at his feet.

Professor Maisch was a prolific writer, a persistent observer and a careful investigator. He was the first American pharmacognosist to recognize the value of the microscope in the study of drugs and adulterants. His hobby was peculiarly that of a searcher after adulterants. As early as 1854 he wrote an article for the *American Journal of Pharmacy* entitled "On the Adulteration of Drugs and Chemical Preparations." Realizing the need of a microscope in his investigations he induced the college to procure one. This arrived in 1861 and Maisch is said to have employed it constantly in his work.

Among his papers bearing upon pharmacognosy were the following: "On *Chelidonium majus*," "African Saffron," "Lycopodium clavatum," "Matico," "Purity of Commercial Spanish Saffron," "On the Adulteration of Volatile Oils," "Sneezeweed," "On the Active Principles of *Rhus Toxicodendron*," "Maize as a Sugar Producer," "Maize Oil" and "On the Tubers of *Dioscorea* sp."

From 1870 until his death Maisch was editor of the *American Journal of Pharmacy*. He was co-editor with Dr. Alfred Stille of the "National Dispensatory" and revised or assisted in the revision of a number of text and reference works including the third edition of "A Universal Formulary" by R. Eglesfeld Griffith, M.D. (1874).

In 1882 the first edition of his "Organic Materia Medica" appeared. This text which passed through five editions became the outstanding standard in its field for several generations.

Maisch died of a malignant growth on September 10, 1893, only a short time after being the first American recipient of the Hanbury Medal for distinguished services and for original research in the natural history and chemistry of drugs.

He has rightly been called one of the master minds of American Pharmacy and he can well be ranked as one of the most industrious and versatile of workers in the field of international pharmacognosy.

EDSON S. BASTIN (1843-1897)

Edson Sewell Bastin was born in Ozaukee County, Wisconsin, on May 29, 1843. His boyhood was spent on a farm where he was obliged to work in the summer and attended the district school in the winter. His parents died before he had reached his teens which threw him on his own resources.

At the age of sixteen he entered Carroll College and pursued work there for three years. The Civil War had broken out, and in 1862 he enlisted in the 28th regiment of Wisconsin volunteer infantry. Within two years after enlistment he was commissioned Captain of the 4th Arkansas Cavalry. Following the war he was offered a cadetship at West Point, but declined the honor and instead entered Chicago University from which he graduated in 1867. In the Fall of the same year he entered the Theological School of the same University and graduated with the

B. D. in 1870. He had intended to preach but his great interest in Botany and other natural sciences influenced him to enter Pharmacy as a means to the end. He was United States Marshal in Indian Territory for several years, and in 1874 returned to Chicago to accept the position as registrar of the University of Chicago in which institution he was soon made an Instructor in Botany. In 1876 he was advanced to the Professorship of Botany and Geology and the same year was made a Lecturer on Botany in the Chicago College of Pharmacy.

In 1883 he resigned from the University of Chicago to devote his entire time to the Chicago College of Pharmacy. Here he first established a botanical and microscopical laboratory.

In 1887, he issued his "Elements of Botany" and, in 1889, the second edition of the work appeared under the title of "College

Botany." This work was destined to be his greatest masterpiece and was widely adopted in both academic and pharmaceutical colleges. In 1890, Professor Bastin resigned his position at the Chicago College of Pharmacy to accept the chair of Botany and Materia Medica in the Northwestern University School of Pharmacy. Here he started another microscopical laboratory and wrote papers on "The Flora of the South Shore of Lake Michigan," "Starches in Root Drugs," "Contributions on Plant Hairs," "Detection of Stem Admixtures in Root Drugs," "Plant Crystals" and "Notes on Vegetable Histology."

In the Autumn of 1893 he became Professor of Botany and Materia Medica at the Philadelphia College of Pharmacy as successor to Professor Maisch.

Within a year he brought about the establishment of a botanical and microscopical laboratory and published another excellent book, "Laboratory Exercises in Botany." This work contained several hundred original drawings.

During 1895 he published nine illustrated papers on local and medicinal plants.



EDSON S. BASTIN

In 1896, he and Henry Trimble began a series of papers on "The North American Coniferæ" which they published in the *American Journal of Pharmacy*. While engaged in preparing a text on pharmacognosy he was stricken with exophthalmic goitre and died as a result of cerebral hemorrhage on April 6, 1897, at the age of 54 years.

Professor Bastin was a staunch advocate of the practical study of the natural sciences. His method was that of studying the plant and drug material in hand, using books only as guides.

JULIUS O SCHLOTTERBECK (1865-1917)

Julius Otto Schlotterbeck was born of German parentage in Ann Arbor, Michigan, September 1, 1865. He received his early education in the public schools of that city and for several years served an apprenticeship in Moore's drug store. In 1885 he matriculated in the School of Pharmacy of the University of Michigan and graduated therefrom in 1887 with the degree of Pharmaceutical Chemist. Shortly after his graduation he became manager of the Eagle Pharmacy in Pittsburgh, Pa., where he served until the Fall of 1888 when he returned to the University of Michigan to become Assistant Instructor in Pharmacognosy and Pharmacy. While serving in this position he pursued studies in the College of Literature, Science and Art of the University from which he was graduated in 1891 with the degree of B.S. in Chemistry. From 1892 to 1895 he was Instructor in Pharmacognosy and Botany in his *Alma Mater*. From 1895 to 1896 he studied abroad at the University of Berne, specializing in Pharmacognosy under the eminent Tschirch and received his Ph.D. in 1896. His inaugural dissertation was on "The Developmental History of Pharmacognostically Important Seeds."



JULIUS O SCHLOTTERBECK

He returned to Ann Arbor in the Fall of the same year and was made Assistant Professor of Pharmacognosy. In 1904 he was advanced to Junior Professor and in 1905 to Professor and Dean of the College of Pharmacy. For a time he was consulting expert for Frederick Stearns and Company and for the J. Hungerford Smith Company.

He has been rated as one of the best teachers of pharmacognosy in the United States. Many of his pupils have attested to his ability, loyalty, faith and vision as his outstanding characters; he lived these and inspired others to live them.

He was a member of many scientific associations, secretary of the American Conference of Pharmaceutical Faculties 1904-1908 and its president from 1910-1912. He was a member of the Committee on Revision of the United States Pharma-

copœia of 1900, and chairman of the Scientific Section of the AMERICAN PHARMACEUTICAL ASSOCIATION from 1902-1903

Dr Schlotterbeck was a brilliant investigator in the fields of pharmacognosy and phytochemistry. He received two Ebert Prizes for outstanding work in the sciences. Among his original contributions are included the following: "Notes on the Behavior of Albuminate of Iron and Ferratin with Artificial Gastric Juice" (with S R Boyce), "Analysis of Kola" (with J W T Knox), "Comparative Structure of the Leaves of *Datura Stramonium*, *Atropa Belladonna* and *Hyoscyamus Niger*" (with A Van Zwaluwenburg), "Clove Bark" (with A Van Zwaluwenburg), "Developmental History of Important Seeds: Cotton Seed and Cacao Seed" (with A Van Zwaluwenburg), "The Alkaloids of *Bocconia Cordata* and the Assay of *Sanguinaria* and Its Preparations" (with Paul Murrill), "The Nature of Commercial Sanguinarine Nitrate, *Adlumia Cirrhosa*: A New Protopine Bearing Plant," "The Structure and Development of the Fruit of *Illicium Floridanum*" (with C R Eckler), "Contribution to the Chemistry of *Stylophorum Diphyllum*" (with H C Watkins), "Does *Argemone Mexicana* Contain Morphine?" "The Development and Structure of the Seed of *Stylophorum Diphyllum* and *Chelidonium Majus*," "The Alkaloids of *Adlumia Cirrhosa*" (with H C Watkins), two papers on "Contribution to the Chemistry of Chelidonine" (with Watkins and Knapp, respectively), "Contribution to the Chemistry of *Bocconia Cordata*" (with W H Blome), "The Development and Structure of the Seed of *Argemone Mexicana*" and "Vanilla Extract" (with J R Dean).

Dr Schlotterbeck was devoted to his wife and family of two boys and one girl, and was delightful company according to many of his friends. He loved music and played the piano well. He also had a fine sense of humor and possessed that rare gift of being able to tell a story well. Due to his German parentage and early training, he spoke German fluently which proved invaluable to him while studying for the doctor's degree at Berne under Tschirch.

In September 1916, while attending a meeting in New York, he was taken ill. Two periods in the hospital failed to help him and he died of a lingering illness at his home in Ann Arbor, June 1, 1917.

(To be concluded)

NEW ZEALAND PHARMACEUTICAL CONFERENCE

Pharmacists from all States and New Zealand met in Melbourne to attend the biennial meeting of the Pharmaceutical Association of Australia and New Zealand.

A varied program of work and entertainment was provided. Commencing with the meeting of the Sciences Association, pharmacy is represented by Section "O" (Pharmaceutical Science) and at the various sessions some valuable contributions of a scientific nature were made. A full session was devoted to "The Expanding Pharmaceutical Curriculum." Dr Roy Gardner, F I C., of New Zealand, presided at the Section "O" meetings, and as the official guest of the Pharmaceutical Society of Victoria,

A R Penfold, of the Sydney Technological Museum, whose work on the Eucalyptus is well known, read two special papers on the subject. Other leading pharmaceutical authorities presented communications that were interesting and instructive.

Following on the Section 'O' sessions the Pharmaceutical Association held its sessions. The Association is the clearing house of Australasian pharmacy. Embracing as it does representatives of all the pharmaceutical bodies in New Zealand and all the Australian States, it focuses attention on national problems, and shapes the pharmaceutical policy for the ensuing two years. A conference of Pharmacy Boards was held after the meeting of the Association.

THE DEPARTMENT OF THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY

C B JORDAN—CHAIRMAN OF EXECUTIVE COMMITTEE, A A C P, EDITOR OF THIS
DEPARTMENT

The following paper by Professor Briggs together with discussions by Drs Burlage and Langenhan are very timely and of considerable interest to all teachers in colleges of pharmacy, and of particular interest to those who teach the subject of pharmacy. How many of the professors of pharmacy will agree with Dean Briggs' statement that "the work included in the Syllabus outlined under 'Theory of Pharmacy and Pharmaceutical Technique' is overemphasized and is receiving an unwarranted amount of time and credit?" Rarely do we find the professor of any subject stating that the time devoted to the subject is in excess. We will all admire Dean Briggs for his outspoken attitude, but will we agree with his conclusions?—C B JORDAN, *Editor*

THEORY OF PHARMACY AND ACADEMIC STANDARDS

W PAUL BRIGGS *

The beginning of the academic year 1932-1933 marked a mile-stone in pharmaceutical education. After half a century of very questionable requirements in quality and quantity, pharmaceutical degrees were brought to a parity with accepted academic standards. The Bachelor's degree carries with it certain implications of learning as well as rights, privileges and responsibilities. The B S degree stands for a rather definite level of attainment in the various fields of knowledge. In most instances the Baccalaureate degree in any major division of knowledge is accepted as the equivalent of the same degree in any other division. Thus, through resolution, the Profession of Pharmacy has placed the educational requirements of future pharmacists on the same plane as Engineering, Law and other respected professions. But resolutions, traditional degrees and *laissez faire* methods will not succeed in creating or preserving respect for the B S in Pharmacy degree. Such respect and acknowledgment can only be attained and preserved if the educational elements leading to this degree are sound and academically comparable to the elements forming the basis for other B S degrees.

Consider the traditional course usually titled "Theory of Pharmacy." It seems unnecessary to define this title or to describe its scope. Almost every college of pharmacy gives such a course, and the usual textbooks on Pharmacy devote from 168 to 256 pages discussing the theory of Pharmacy. The Pharmaceutical Syllabus requires 256 hours of Theory of Pharmacy, and Pharmaceutical Technique, which, the Syllabus recommends, should parallel each other. Without challenging the need for such instruction, for the moment, consider this fact, 192 didactic hours of Theory of Pharmacy and 64 laboratory hours of Pharmaceutical Technique, assuming that these courses measure up to established academic standards, would receive $13 \frac{1}{3}$ credit (semester) hours, or over 10% of the usual 120 credit (semester) hours required for the B S degree. Bear in mind that this requires more time and more credit (semester) hours than Organic Chemistry and more than Botany and Physics together. Can this be justified academically? With due respect to the purposes of the Syllabus and to the objectives of pharmaceutical educators, I submit that it cannot be justified and further that when these

* Professor of Pharmacy The George Washington University, School of Pharmacy

two pharmacy courses and any other academic course are compared, the results will place pharmaceutical education on the defensive

Over one-half (Sections B and C) of the outline in the Syllabus under Theory of Pharmacy deals with simple details which are necessarily considered in other courses. In discussing, for example, Sulphur or Alcohol under Theory of Pharmacy we are advised by the Syllabus to teach, "commercial phases incidents of historical importance nomenclature, official status, official uses, official preparations, classifications, pharmaceutical uses, methods of handling, preservation, etc." Sulphur and Alcohol, and every other item covered by Sections B and C of the Syllabus, under Theory of Pharmacy must be studied under some other course, such as Inorganic or Organic Pharmaceutical Chemistry. From an academic point of view these facts should be considered at the time these compounds are presented in the courses in Pharmaceutical Chemistry. It is probable that such information is now given in the courses in Pharmaceutical Chemistry, thus duplicating effort and needlessly consuming valuable time.

As to Sections A and D, I feel that the material suggested by the Syllabus is pertinent. However, it appears that tradition has been used as a yardstick rather than progress in developing Section A. The present-day student is educationally far advanced over those of fifty years ago, and Pharmaceutical practice has undergone far-reaching changes. Many students entering upon the study of Pharmacy to-day have had courses in High School Physics and Chemistry. Physics is recommended by the Syllabus, required by many colleges, and should be a part of the scientific training of all pharmacy students. With these conditions in mind, does it not seem that we are overemphasizing, under Theory of Pharmacy and Pharmaceutical Technique, the teaching of "Heat, Evaporation, Solution, Crystallization," etc? This knowledge a student should certainly have but it is not necessary to devote two courses to teaching it. In his laboratory work in Botany, Chemistry, Physics and Pharmacy he actually carries out each of these processes, and does so with a definite objective. Such training is far more valuable than when done in an abstract manner. Preparing Fluidextract Belladonna leaves by percolation presents a vivid picture which is not soon forgotten, but packing a percolator with sawdust smacks of kindergarten methods.

I have discussed in detail the Syllabus outline for Theory of Pharmacy and Pharmaceutical Technique with the members of our Chemistry Department. It was found through this conference that every process and theory, outlined under Pharmaceutical Technique and Section A of Theory of Pharmacy, was actually employed in either the Chemistry or Pharmacy laboratory courses. The scope and methods of teaching General or Inorganic Chemistry have been fairly well fixed and in the majority of universities an 8-credit hour course of 2 lectures and 2, 3-hour laboratories per week for a year is given. No special course is given dealing with technique or process, but when a process is used for the first time, the instructor explains it, and the student proceeds immediately to employ the process to a definite objective. Now, if in teaching Chemistry, the student learns about filtration, precipitation, etc., and uses this knowledge as a means to an end, why in teaching Pharmacy, should the same processes and techniques be taught as Theory of Pharmacy? My answer is that we have been playing "Follow the Leader." Large books were written fifty years ago which attempted to cover

every phase of the practice of pharmacy They were, in most cases, prepared for apprentices who never expected to attend College and who often possessed less than a grammar school education To these young men the words filtration, precipitation, vaporization, etc., were terrifying and mysterious and they needed a simple description of the processes and techniques involved But such is not the case to day Chemistry courses have shown us that freshmen students can work intelligently in the laboratory without spending 256 hours learning a few simple principles A few pharmaceutical processes, such as drug extraction, may require more than superficial discussion and demonstration, but most of the work in Pharmaceutical Technique and Section A of Theory of Pharmacy, which is not covered in other courses, could be incorporated as a part of Operative Pharmacy The old argument that repetition impresses facts upon students may be brought out in defense of the Syllabus I would answer that argument with two questions In what other academic courses is duplication resorted to? Are we willing to admit that pharmacy students, apart from all other university students, require repeated drilling in order to acquire knowledge? We should ask ourselves these two questions when we attempt to justify Sections B and C under Theory of Pharmacy The propriety of Section D is granted but its position in the curriculum is questioned

Personally, the best results have been obtained by combining the material covered by the Syllabus under Theory of Pharmacy, Pharmaceutical Technique and Operative Pharmacy, and deleting those parts here objected to For these three courses the Syllabus requires a total of 448 hours The set-up which has given satisfactory results is a 10-credit (semester) hour course of 96 hours of lecture and 192 hours of laboratory, a total of 288 hours, or $\frac{1}{3}$ less than recommended by the Syllabus for the three courses In this course everything is carefully covered that the Syllabus includes under Operative Pharmacy This work is preceded by lectures and demonstrations of the important features of Theory of Pharmacy and Pharmaceutical Technique, omitting those parts which are superfluous or which are adequately covered in other courses Part D, under Theory of Pharmacy, which deals with the pharmacist as a member of the social order and in a professional status is omitted from this course, but is presented in Dispensing Pharmacy, where it seems to belong

Results indicate that fundamental educational elements have not been slighted The students complete the course with a wholesome respect for the work which they have done, they are not hurried and there is no evidence that any essential features of their training have been omitted This is not offered with the idea that it is a perfect arrangement or that it should be universally adopted, but merely to support my personal views

It may be that because of the professional background of pharmacy and because of the diversified knowledge which a pharmacist is expected to possess, we are justified in requiring an amount of educational training, in both hours and credits, in excess of the usual requirements for the B S degree However, I cannot subscribe to this reasoning When we offer a B S in Pharmacy degree we should compare it academically to a B S degree in Chemistry, Engineering, etc., and not to the purely professional degrees, such as D D S or M D We have gone on record as approving an established degree for pharmaceutical education and

we should make our curricula conform to the established requirements for that degree. If we require an amount of work much in excess of 120-credit (semester) hours, examination of our curriculum, which is bound to come now that we are granting an academic degree, will raise a serious educational question. The answer will probably be either that our quality requirements are low or that the material of our curriculum does not warrant the credit or hours which we have assigned. By granting a purely professional degree we could avoid this inevitable analysis of our courses, but I most certainly would not recommend meeting the problem in that way.

In conclusion it seems to me that we need to carefully study our several courses, particularly Theory of Pharmacy and Pharmaceutical Technique, and adjust the time and credit evaluations on a sounder academic basis. Let me strongly emphasize here that I do not mean to minimize the necessity or value of these or any other Pharmaceutical courses outlined by the Syllabus. The issue which I raise is essentially a modernization of our traditional courses in the light of academic standards. In the hope of provoking discussion let me restate my stand, that the work included in the Syllabus outlines under Theory of Pharmacy and Pharmaceutical Technique is overemphasized and is receiving an unwarranted amount of time and credit (semester) hours, and, that the entire four-year course in Pharmacy can and should be brought in line with other baccalaureate degree courses in terms of clock hours and credit (semester) hours.

THEORY OF PHARMACY AND ACADEMIC STANDARDS

A DISCUSSION OF A PAPER BY THIS TITLE PRESENTED BY W. PAUL BRIGGS

BY HENRY M. BURLAGE *

In discussing Dean Briggs' paper I wish, first of all, to congratulate him on his efforts and to say that, on the whole, I agree with the content and intent of such discussion. There is no doubt in anyone's mind that the adoption of the minimum four-year course by the colleges of the Association has cast upon the educators in the Profession of Pharmacy new responsibilities. Now that such a course has been obtained after years of struggle and planning, these educators should not sit back with an air of complacency but should direct new efforts to modernizing, stabilizing and unifying a curriculum which was established to meet an unfortunate two- and three-year requirement and as a result has been haphazard in its structure. I am glad to note that Dean Briggs sets forth in part the responsibilities accompanying the new "mile-stone in pharmaceutical education."

In his discussion, the author has singled out those sections of the Pharmaceutical Syllabus, which in my own mind are of greatest importance in our pharmaceutical curriculum in building a theoretical and professional background. It probably would have been much better if the various subdivisions of Theory of Pharmacy, Technique and Operative Pharmacy had been outlined as separate

* Professor of Pharmacy, School of Pharmacy, University of North Carolina, Chapel Hill, N. C.

courses to clarify a confusing situation, especially as to time allotment. This latter fact is evidenced in a study of the curricula and courses of the various member colleges. The greatest thought and consideration should be given to these Sections.

With regard to Sections B and C under Theory of Pharmacy (Syllabus, pages 113-117) there certainly is much in the outline that needs changing to avoid unnecessary duplication. These divisions should be developed still further to include work that is not given in basic courses of General Chemistry (Inorganic Pharmaceutical Chemistry) or Organic Chemistry (Organic Pharmaceutical Chemistry). The courses in chemistry, if basic, cannot certainly give the important aspects of the inorganic and organic medicaments and their requirements, standards, etc. Section B should include non-repetitious material about the official inorganic compounds, studying them from the angle of their periodic classification—not alphabetically as is usually done—accompanied by laboratory work performing the necessary U S P tests and more especially preparing and studying the official preparations involving chemical reactions of these substances. Certainly such course content cannot be presented adequately in a course in General Chemistry of Pharmaceutical Chemistry of a basic character.

Section C should likewise be given after a basic course in Organic or Organic Pharmaceutical Chemistry stressing the official organic drugs and principles and finally, but of rapidly increasing importance, ethical New and Nonofficial Remedies of this character. One needs also only to step behind the prescription counter of the average pharmacy to learn immediately the growing importance and value of a knowledge of medicines of organic character, especially from the dispensing standpoint.

Section A appears as an example where, as the author says, "tradition has been used as a yardstick rather than progress in developing this course." There may be overemphasis and duplication in the teaching of "Heat," but there appears to be a need of a modernized course in technique (or whatever one wishes to call it), which although it might appear simple in its make-up but necessary in curricula in sections of the country, where many of the high schools are small—where one teacher gives instruction in more than one subject with the result that one cannot depend too greatly on the student's knowledge of the simplest processes and theories. Physics and Chemistry are, no doubt, much better presented in the large city high schools and Dean Briggs' statements in this regard would apply to those Pharmacy schools drawing students from the large and well-equipped high schools.

Dean Briggs' statement that every process and theory outlined under Pharmaceutical Technique and Section A of Theory of Pharmacy was actually employed in the chemistry and pharmacy laboratory does not apply to the situation in most schools. It is true that many of the processes should be and are studied or mentioned in General Chemistry. However, in most of the State institutions this subject is taught to the masses in large laboratory and lecture sections with the result that they know little or nothing about the practical applications of processes, the theories and the practices of the same. As a whole they appear as a poorly trained lot, who are only capable of using a laboratory manual of specific directions efficiently. If the processes mentioned are grasped by the students of pharmacy in

other courses as Chemistry and Physics, there certainly is no need of them in our curricula, but I fear that such a fortunate condition does not obtain if my observations in four institutions located in widely separated sections mean anything

I cannot agree that the material in the Syllabus under Theory of Pharmacy, Technique and Operative Pharmacy can be covered in one course of 10 semester hours, but should be in 400-432 hours (18-19 semester hours) including Technique ($48 + 64 = 112$), Galenical Pharmacy ($64 + 96 = 160$), Pharmacy of Inorganic ($32 + 48 = 80$) and Organic Materials ($48 + 0 = 48$ or $48 + 32 = 80$) providing the material in the last two subjects named is not given in Organic Pharmaceutical Chemistry of a non-basic character. This with at least 10 semester hours of Dispensing (totaling 28-29 hours) is equivalent to about 25% of the total hours required for a B S degree. For the same degree in Chemistry, basic courses equivalent to about 35 semester hours are required. There is no question that Part D of Theory of Pharmacy can be adequately placed in other sections.

The author indicates that the textbooks of Pharmacy are too voluminous because of conditions mentioned, it appears that there is a dire need of revising these costly texts into books of a more theoretical nature rather than copies (to a great part) of the U S P and N F. A comparison with the later editions of English texts show some interesting differences as to presentation of pharmaceutical theory and subject matter.

I agree with Dean Briggs that we are not justified in requiring more than the usual 120 semester hours for a B S degree, and in order to stay within these bounds it behooves us to examine our curricula and course contents very closely, in order to withstand and avoid critical examination.

One value of this paper to my mind is the fact that it presents an idea that worthy work might be done in this Conference by devoting a portion of each annual meeting to a very serious and critical examination of course content, distribution, etc., using the Syllabus as a possible starting point with an idea of developing the pharmacy courses so that they might be of the greatest value in developing the knowledge and pride of the student of pharmacy in his profession.

THEORY OF PHARMACY AND ACADEMIC STANDARDS

A DISCUSSION OF A PAPER BY THIS TITLE PRESENTED BY W. PAUL BRIGGS

BY H. A. LANGENHAN *

If you will define Pharmacy (Practical) as the application of the knowledge and training in Physics, Chemistry, Botany, Therapeutics, etc., *to the making of medicine*, you may readily realize that too much time is not given to this subject in any college.

The Syllabus outline is to help, in part, those who are not qualified to teach this subject, and those who do not understand what it is about, who naturally wonder what they should teach and why the subject is listed. Practical Pharmacy is not a special subject, it is a *specialized general subject*.

In order to teach in this broad field a foundation in all of the prerequisite

* Professor of Pharmacy, University of Washington, Seattle, Washington

fields is necessary. The instructor must be sufficiently versed in Physics in order to demonstrate and explain the applications of this field to pharmaceutical operations and methods. He must be able to explain the application of colloidal chemistry in manufacturing, such as extraction emulsification, incompatibility, etc., the application of p_H in connection with preservation, incompatibility, etc. His training in organic and plant chemistry must be broad so that he may discuss the stability or instability of alkaloids, oils, glucosides and other plant constituents in galenical preparations, and the ever-present problem of incompatibility of these substances.

The question of solvents, vehicles, flavors, coloring agents all call for special information to be applied to the making of medicines. The applications of therapeutics and pharmacognosy are important.

The scope of the field of Practical Pharmacy as an applied subject is enormous. One could go on and on citing "applications" of these fundamental subjects.

Up to the present time pharmacy instructors have not been especially trained for this work, but have been compelled to develop their own course of instruction. The type of instruction given is influenced by preliminary training and by the fundamental training of the students entering the classes. It calls for a well-correlated curriculum and a cooperative faculty in order to properly qualify the student in these subjects so that the pharmacy instructor need not teach chemistry, materia medica and other fundamentals, but may devote his entire time to *application* of these fundamentals to the "making of medicine."

In discussing for example, Arsenical Solutions, the instructor should develop the history of arsenicals in general, the pharmacopœial (U S P and foreign) development, the chemistry, the manufacturing, therapeutics, incompatibility, dispensing and correlate this summary with the story of the new arsenic remedies now in use. A skeleton outline of this single subject will indicate the various fundamental fields required for a fair understanding of the subject.

One serious handicap for pharmacy is the teaching of pharmacy students by non-pharmaceutical and non-cooperative teachers, in these fundamental subjects. With the proper preparatory instruction the student is ready for the pharmacy instructor who, if qualified, will find that he has insufficient time in any of the present existing curricula to cover the entire applied field. This application of fundamentals is not repetition, no more than advanced German is a repetition of beginning German. I will not be at Washington, so offer this material for you to present as personal property or any way you wish.

DRUG SALES SCHOOL

Salesmen calling on the drug trade attest to the success of the Sales School of the Detroit Retail Druggists' Association.

An official of the Association said that repeatedly he has been informed that stores are taking on new appearances. Probably the greatest change is the quick appearance of attractive open displays, in many cases the addition of island displays in the store. Other

stores have faced a general clean-up, new store arrangement and display material.

The success of the first school on drug store merchandising has led the Association to plan for another year. It is probable that next year the school will cooperate more closely with the pharmacy departments of local colleges should local druggists show sufficient interest to attract the sponsoring of lecturers. The final two sessions found an increasing attendance — *Detroit News Boosler*

PROCEEDINGS OF THE LOCAL BRANCHES

"All papers presented to the Association and Branches shall become the property of the Association with the understanding that they are not to be published in any other publication prior to their publication in those of the Association, except with the consent of the Council"—Part of Chapter VI, Article VI of the By-Laws

ARTICLE III of Chapter VII reads "The objects and aims of local branches of this Association shall be the same as set forth in ARTICLE I of the Constitution of this body, *and the acts of local branches shall in no way commit or bind this Association, and can only serve as recommendations to it* And no local branch shall enact any article of Constitution or By-Law to conflict with the Constitution or By-Laws of this Association "

ARTICLE IV of Chapter VII reads " Each local branch having not less than 50 dues paid members of the Association, holding not less than six meetings annually with an attendance of not less than 9 members at each meeting and the proceedings of which shall have been submitted to the JOURNAL for publication, may elect one representative to the House of Delegates "

Reports of the meeting of the Local Branches shall be mailed to the Editor on the day following the meeting, if possible Minutes should be typewritten with wide spaces between the lines Care should be taken to give proper names correctly and manuscript should be signed by the reporter

CHICAGO

The 226th meeting of the Chicago Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held January 15, 1935, at the University of Illinois College of Pharmacy

The speakers of the evening were, Dr D L Tabern, Research Chemist, and H C Struth, Pharmacologist, of the Abbott Laboratories They discussed "Recent Developments in Hypnotics "

Dr Tabern gave a short history of the development of the barbiturates and their increased use The barbiturates were classed as a veritable gold mine for the organic chemists They are of interest to the physician and pharmacist, the speaker pointed out that they are being used so much to day and there are many with different actions

Lantern slides were shown and Dr Tabern discussed the chemistry of such well known barbiturates as Ipral, Allonal, Dial, Neonol, Amytal, Evipal, Nembutal, Pernocton, Ortol, Phenobarital and Barbital, showing the effects caused by changing and adding chemical groups to the basic formula About 95% of these are given orally, others are given hypodermically or rectally

Mention was made of combining the barbiturates with amidopyrine, of marketing them in cough syrups to take the place of codeine and used in conjunction with ephedrine

Mr Struth took up the discussion at this point and outlined the methods of calculating the sleep producing power of barbiturates

Albino rats are injected subcutaneously with the sodium salt of the compound The minimum lethal dose and minimum effective dose is determined Sleep in these experiments is taken as the stage where tickling in the ear with a small prod will produce no effect These results are not taken as a clinical parallel, but only as a guide

Albino rats were injected and the tests were run by Mr Struth as a practical demonstration for the large group assembled

Dr Tabern resumed the discussion showing charts giving a graphic comparison of the minimum lethal dose, minimum effective dose and safety margins of the popular barbiturates The comparisons were made with barbital and a chart was also shown that compared the length of drug duration

Mr Struth took up the discussion and demonstration at this time and injected three rabbits intravenously with the sodium salts of barbital, evipal and nembutal

A discussion relative to the elimination of the compounds showed that some are eliminated unchanged in the urine while others are detoxified in the liver No damaging effects on the liver have been reported at this time

At the close, the practical uses of the barbiturates were outlined Phenobarbital was named a specific for epilepsy, a property peculiar unto itself Other uses of the compounds mentioned were, as an antidote for strychnine poisoning, as an antidote for local anesthetics such as

cocaine, as a hypnotic, in rare cases as a general anesthetic and for pre medication for a general anesthesia

LAWRENCE TEMPLETON, *Secretary*

NEW YORK

The January meeting of the New York Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held on the evening of January 14, 1935, in the College of Pharmacy, Columbia University. About thirty members and their guests attended.

The meeting was called to order by President Ballard and the report of the secretary was read and approved. The treasurer's report showed a balance.

The secretary reported that the application of Mr. Harry Kaye for membership in the AMERICAN PHARMACEUTICAL ASSOCIATION had been forwarded to Secretary Kelly.

Chairman Schaefer, of the Committee for the Fischelis Dinner presented his report giving a complete outline of all disbursements and receipts. His report appears in the files of the secretary and showed a net surplus of \$2 79. Dr. Ballard thanked Dr. Schaefer on behalf of the New York Branch for the fine service he had rendered in managing so successful a testimonial dinner for Dr. Robert P. Fischelis. Dr. Bihuber made a motion expressing the thanks of the Branch to Dr. Schaefer. The motion was seconded by Mr. Steiger.

Chairman Lehman, of the Committee on Education and Legislation, then reported the following:

'Beginning January 9, 1935, the National Industrial Recovery Board has been holding hearings on the question of 'Price Fixing' as exemplified in various Retail Codes. The outcome is awaited with great interest and anxiety, especially by the retail drug trade.

'The General Wholesale Code Authority started its meetings at the Mayflower Hotel on January 8, 1935 in reference to amendments to the codes and adoption of codes for industries not coded. The Wholesale Drug trade was not included in this hearing.

'The Federal Alcohol Control Administration is seriously considering the interpretation of the Distillers' Code which will have the effect of limiting the sale of alcohol to the retail druggists in glass containers not exceeding 1 gallon, such containers not to be used a second time. This is objected to by the representatives of the Retail Drug Trade as it will add considerably to the cost, not only of the alcohol but of the preparations made therefrom especially in New York State, where alcohol can only be sold to the public on a physician's prescription.

'On January 4th, Senator Copeland introduced S. 5, a bill superseding the Tugwell Bill S. 2800, and said to require formula disclosure or filing the formula with the Secretary of Agriculture. Therapeutic claims are to be substantiated by competent medical authorities in every particular, the bill empowers the Secretary of Agriculture to make regulations having the force and effect of law. In the case of habit-forming drugs it empowers the Secretary to determine what drugs are habit-forming. Cosmetics are included with articles of food and drugs in the bill.

"Representative Treadway will introduce early in the session a bill calling for a 2½% manufacturers sales tax. This tax will no doubt be passed on to the long suffering retailer in pyramided form, and should be opposed by the drug trade.

'The Bureau of Narcotics is endeavoring to have introduced in some thirty-six states the uniform Narcotic Law, similar to the Harrison Act and the New York State Narcotic law.

"The Retail Drug Code Budget has been approved, with appropriate provision for the federal and local authorities. In New York City collections have begun \$1.00 for every registered person employed or non registered if employed in the drug department for 60 hours or more weekly. Payment is mandatory.

"News from Albany indicates that a bill is to be introduced which will provide that all restaurants in drug stores must be enclosed in a separate room."

Mr. Lehman was then called upon to present his report as chairman of the Committee on Nominations. This report was as follows:

"To the members of the New York Branch of the American Pharmaceutical Association—

"Your committee on nominations begs to submit the following nominees for office for the year 1935: President, Charles W. Ballard, Vice-President, Frederick C. A. Schaefer, Secretary, Rudolf O. Hauck, Treasurer, Turner F. Currens, Committee Chairman, On Audit, Ernst A.

Bilhuber, *Education and Legislation*, Robert S Lehman, *Membership*, Cosmo Ligorio, *Professional Relations*, James H Kidder, *Progress of Pharmacy*, Leonard W Steiger, *Secretary*, *Remington Medal Committee* and *Delegate to the House of Delegates*, Hugo H Schaefer

(Signed) { ROBERT S LEHMAN
ERNST A BILHUBER
LEWIS N BROWN

Following the reading of this report, Dr Schaefer moved that it be received, seconded President Ballard then called upon Dr Schaefer to take the chair during the election Mr Dworkin moved that the secretary cast one ballot unanimously electing the nominees, seconded and approved The secretary cast the ballot accordingly

Dr Ballard then resumed charge of the meeting and expressed his thanks

The application of Mr Edward A Wickam for membership in the New York Branch was received and approved

Before introducing the speaker of the evening, President Ballard called attention to the unfortunate circumstance that midterm examinations were being held in the College of Pharmacy this week and that another meeting was to take place the following night This combination of circumstances had adversely affected the usually good attendance and the president expressed regret to the speaker that more members were not present

President Ballard then introduced William A Lott of the Research Laboratories of E R Squibb & Sons, Inc

Mr Lott spoke on the 'Rational of Chemo-Physiological Research' He began by pointing out the intensive research conducted before a new chemo therapeutic agent is put on the market He called attention to the three prime requisites of a satisfactory product *First* that it have high activity, *secondly* low toxicity, and *thirdly*, no pernicious or undesirable effects From the theoretical viewpoint, he indicated that progress had been made in determining what chemical groups were responsible for particular physiological actions In this regard considerable work had been done in the research laboratories He then discussed some of the open chain hydrocarbons of both the saturated and unsaturated series and indicated how the narcotic power increased with increasing molecular weight

He spoke of the influence of the substitutions of the OH-groups Passing on to the compounds of the aromatic series he explained the influence of the phenyl groups and aromatic amines, and closed with a presentation of a theory of narcotics which had been more recently developed

A rising vote of thanks was accorded the speaker

RUDOLF O HAUCK, *Secretary*

NORTHERN NEW JERSEY

The regular January meeting of the Northern New Jersey Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held at the Rutgers University College of Pharmacy, Newark on Monday evening, January 21st, with President Ernest A Little presiding

William L Sampson assistant professor of Biochemistry, Rutgers University College of Pharmacy, and member of the staff of the Merck Institute of Therapeutic Research, addressed the members of the branch on the subject of ascorbic acid The speaker traced the early history of the disease of scurvy among sailors on long sea voyages, soldiers campaigning in foreign lands, prisoners confined in jails, and even the populace of the larger cities of the world He told how investigators as early as 1752 found that scurvy was due to a dietary deficiency and could only be cured by the addition of fresh vegetables and fruits to the diet Bringing the study down to the present day, Professor Sampson outlined the research which led to the isolation of the principle contained in fresh vegetables and fruits which cured scurvy and its natural and synthetic production in suitable form for medicinal use

Professor George C Schicks presented the report of the Committee on Professional Relations in which he outlined the work being carried on by a joint committee composed of the Committee on Medical Practice of the Medical Society of New Jersey and the Committee on Professional Relations of the New Jersey Pharmaceutical Association which has as its goal the publication of a New Jersey Formulary

The meeting was well attended and members joined in the discussion of the committee reports and the address of Professor Sampson

C L Cox, *Secretary*

PHILADELPHIA

The December meeting of the Philadelphia Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held at the Philadelphia College of Pharmacy and Science on Tuesday evening, December 11, 1934

The minutes of the previous meeting were read and approved, and President Barol introduced Dr Arno Viehoveer, Research Professor of Biology at the College, as the speaker

His topic concerned the action of organic cathartics and recent developments in standardizing their activity A micro projection of a living daphnia was shown with the intestine and glands impregnated with a vital stain, facilitating the study of these organs

Graphic formulas for substances such as Emodin, chrysophanic acid and aloe emodin were placed on the blackboard, and an explanation made concerning the difficulty of chemical analysis of them Dr Viehoveer then presented a series of graphs showing quantitatively the effect of aloin and aloin residue on the intestinal activity of the daphnia, stating that positive quantitative results were obtained A moving picture of the progressive activity of a solution of cascara sagrada showed the laxative effect on the daphnia

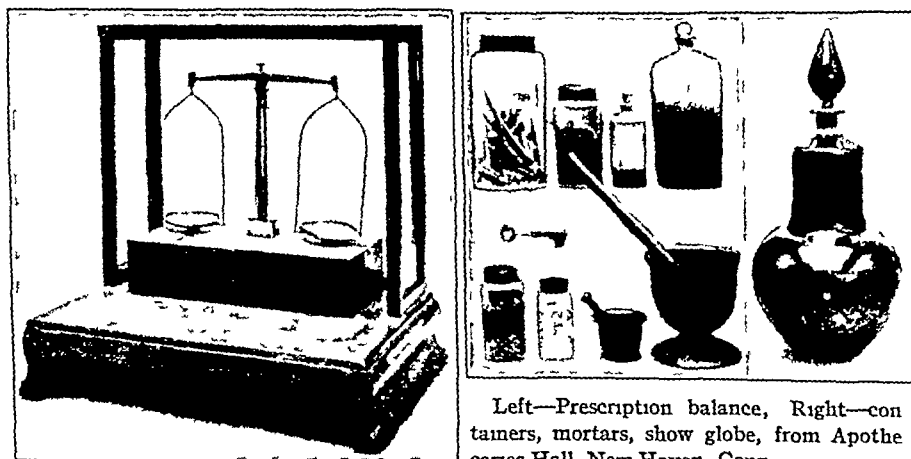
Dr Viehoveer gave brief explanations of the effects on dogs and daphnia of the following drugs Aloin, cascara, senna rhubarb and podophyllum The effect of the toxic substances in podophyllum was demonstrated

Experiments showing the relative amounts of mucilage released from cathartic drugs, such as psyllium seeds and certain patented mucilaginous cathartics, were performed

At the close of the lecture Dr Viehoveer showed lantern slides of former workers in biological subjects and suggested that their work should be checked and verified instead of taking their discoveries as facts

E H MacLAUGHLIN, *Secretary*

Pharmacist John Cameron, member of the AMERICAN PHARMACEUTICAL ASSOCIATION favored us with a copy of the Formulary published by the Committee on the Hospital of the Peiping Union Medical College The Formulary consists for the most part of drugs and preparations official in the Chinese Pharmacopœia or contained in the "New and Nonofficial Remedies" It is a book of 70 pages



Left—Prescription balance, Right—containers, mortars, show globe, from Apothecaries Hall, New Haven, Conn

ASSOCIATION BUSINESS

AD INTERIM BUSINESS OF THE COUNCIL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, 1934-1935

Office of the Secretary, 2215 Constitution Ave , Washington, D C

LETTER NO 11

January 18, 1935

To the Members of the Council

54 *Committee on Maintenance* In accordance with Motion No 6 (Council Letters No 6, page 1149, and No 7, page 1244) the note for \$40,000 00 held by the Maryland Trust Company was paid in full on December 31 1934

55 *Contract for Printing, Binding and Distribution of the Year Book, Volume 22* Motion No 14 (Council Letter No 8, page 1246) has been carried and the contract has been awarded to the Lord Baltimore Press, Baltimore, Md

56 *Contract for Printing and Mailing the Journal of the A Ph A for 1935* Motion No 17 (Council Letter No 10 page 66) has been carried and the contract has been awarded to the Mack Printing Company, Easton, Penna

57 *Use of Text of the N F* Motion No 15 (Council Letter No 8, page 1246) has been carried and the J B Lippincott Company have been advised

58 *Budget for 1935* Motion No 18 (Council Letter No 10, page 68) has been carried and the budget for 1935 is approved

59 *Selection of Auditors* Motion No 19 (Council Letter No 10, page 68) has been carried and W A Johnson & Co have been employed to audit the accounts of the Association for 1934

60 *Appropriation for Maintenance of Building for 1934* In submitting the budget for 1934, it was stated that the expenses of maintenance could not be estimated and the budget carried \$1800 00 In submitting the budget for 1935, it was stated that as soon as the expenses for maintenance for the year were known a motion to increase this appropriation would be submitted, in accordance with Article II of Chapter II of the By-Laws of the Council The expenses have totaled \$3227 29

(*Motion No 21*) It is moved by Kelly that the appropriation for the maintenance of the Building for 1934 be increased to \$3300 00

61 *Headquarters for the 1935 Meeting* See Council Letters No 4, page 945, and No 6, page 1150

Local Secretary Mickelsen has advised that the Idaho Pharmaceutical Association has decided to join with the Oregon and Washington Associations in holding their annual meetings for 1935 in Portland, and on Monday and Tuesday of the week of the A Ph A meeting

The following is quoted from his letter

"I am very pleased to inform you that plans and arrangements for the 1935 meeting at Portland, Oregon, in my opinion, have been arranged very satisfactorily

"A meeting of the A Ph A Branch was held at the College on December 4th and it was unanimously voted that the A Ph A Branch assume all responsibility of financing the national convention On Wednesday, December 5th a joint meeting was held with the Oregon State Pharmaceutical Association Portland Retail Drug Association and the A Ph A Branch During this meeting it was decided that the tri state convention members namely, Oregon, Washington and Idaho, would officially close their meeting Tuesday evening in time to join with the A Ph A and hold a joint banquet and dance This should be an ideal arrangement for our convention Undoubtedly a number of retail pharmacists attending our banquet and dance will remain for the remaining meetings of the convention Buyer's Week will in no way interfere with our meeting This leaves the remainder of the week from Tuesday to Saturday free for business and activity for A Ph A members

"It was unanimously voted that the convention dates be set for the week of August 5th to 10th, inclusive, and I hope that this will meet with the approval of your Council

"I was given the authority to appoint a convention committee to take charge of A Ph A arrangements The following members were appointed George L Haack, *Chairman*, F C Felter *Publicity Chairman*, Frank Nau, Earl Gunther, Edgar Stipe, Fred Geue, *Treasurer*, and Fred Grill This committee met at the

Multnomah Hotel, December 7th and we wish to recommend that the Multnomah Hotel be chosen as Headquarters for our 83rd annual meeting. The hotel management assured us of every hospitality, good food and coöperation in every way possible to make our convention a success. In other words, the hotel is really turned over to A. P. H. A. activities during that week. The arrangement of the Hotel on the mezzanine floor is ideal for convention meetings. Aside from this, the Multnomah has a banquet hall which is suitable for six hundred guests and in an emergency, one thousand.

"The enthusiasm of our convention seems to have regained the momentum it lost for a while, and I feel confident that the A. P. H. A. has a real reception in store.

"It is also planned to appoint state auxiliary committees from Washington, Idaho, Oregon, Montana and California. The purpose of these auxiliary committees will be to stimulate interest in our convention and to get additional members for our association."

(Motion No. 22) It is moved by Kelly that the Hotel Multnomah, Portland, Oregon be approved as the headquarters for the 1935 meeting of the A. P. H. A.

62 *Time of the 1935 Meeting* It will be noted that parts of Local Secretary Mickelsen's letter as quoted above, refer to the time of the meeting.

Only two letters were received in response to the request for comments or suggestions with respect to the time of meeting, as made in Council Letter No. 4, page 945, and these were not quoted earlier pending the receipt of the final recommendation from the Local Committee.

The following quotations are from a letter from President Fischels:

"I think it is important for the Council to give consideration to the following points in deciding upon the time of the meeting.

"Are we interested in well attended meetings of the AMERICAN PHARMACEUTICAL ASSOCIATION, or do we merely want a crowd? I ask this question because past experience will show that on Monday and Tuesday of the convention week members of faculties of Colleges of Pharmacy and members of Boards of Pharmacy are

in attendance in large numbers. Tuesday night of the convention week is the high point in attendance. Beginning Wednesday, members of Boards of Pharmacy and College faculties start to leave, and by Friday a mere handful of persons is in attendance at the most important sessions of the AMERICAN PHARMACEUTICAL ASSOCIATION.

"The Buyers' Week will undoubtedly attract a great many retail druggists to Portland as will also the meetings of the State associations which are scheduled for Monday and Tuesday. Under the proposed arrangement you will add to the heaviest days of the convention week additional attendance of members of the State associations and those who are coming for the Buyers' Week. It will look like a tremendous convention on Monday, Tuesday and Wednesday. On Thursday and Friday, when the main business of the Association is conducted, you will have only the old standbys to rely on.

"Of course, if all of the members of the State associations scheduled to meet on Monday and Tuesday were members of the AMERICAN PHARMACEUTICAL ASSOCIATION, the situation might be different. What will happen on Monday and Tuesday is that some members of the State associations will drift into the meetings of the American Association of Colleges of Pharmacy or of the National Association of Boards of Pharmacy, thinking that they are meetings of the AMERICAN PHARMACEUTICAL ASSOCIATION, and they will be very much disappointed in the discussion which they will hear because the chances are they will be on technical matters in which the average retail druggist has little or no interest. On the strength of this these retailers will decide that it is useless to stay over for the balance of the week.

"We all know that meetings of the AMERICAN PHARMACEUTICAL ASSOCIATION are already overcrowded with respect to events and specialized meetings, and considerably undermanned with respect to attendance.

"Unless there is a much better reason than the mere presence of a large number of people milling around in the headquarters hotel, I would strongly urge the selection of the week of August 12th in preference to the week of August 5th."

Mr Philip wrote as follows

"Reviewing the letter received from Dean Mickelsen of Portland, Oregon, and thinking over other information received concerning Buyers' Week which is to be held in Portland during the week of August 5, 1935, one of the weeks contemplated by the AMERICAN PHARMACEUTICAL ASSOCIATION officials to hold their annual Convention in Portland, I think that the ASSOCIATION meeting will be more successful if the earlier week in August is accepted even though this week would be concurrent with Buyers' Week in that city

It so happens that the University of California opens early in August. If we expect any attendance from that nearby group, a later date in August would conflict with those who are interested in the University of California activities

"I have come to the conclusion that those who attend only part of the Convention are not affected by outside entertainment or special conditions

' If our weekly program were reversed, those people who come to the Convention and stay only Monday and Tuesday, would change their plans and not arrive at the Convention until Thursday and then leave Friday "

(Motion No 23) It is moved by Philip that the week of August 5 to 12, 1935, be approved as the time for the 1935 Meeting

LETTER NO 12

To the Members of the Council

63 *Committee on the Proposed Council on Pharmaceutical Practice* President Fischels has called attention to the omission from *Motion No 16* (Council Letter No 9, page 66) of the recommendation of the Committee (see page 65) that a Council on Pharmaceutical Practice be established. No further comment has been received

A vote is now called for on the motion as follows

(Motion No 24) It is moved by Fischels that the report of the Special Committee on the Proposed Council on Pharmaceutical Practice be received, that the Council approve the establishment of a Council on Pharmaceutical Practice to be conducted under the auspices of the American Pharmaceutical Association with personnel as recommended by the Special Committee and that

the Special Committee be continued for the purpose of developing the plan in conjunction with the Council on Pharmaceutical Practice and report at the Portland meeting

64 *Appropriation for Maintenance of Building for 1934* Motion No 21 (Council Letter No 11, this issue of the JOURNAL) has been carried and the appropriation is increased

65 *Headquarters for the 1935 Meeting* Motion No 22 (Council Letter No 11, this issue of the JOURNAL) has been carried and the Multnomah Hotel is approved as the headquarters

66 *Time for the 1935 Meeting* Motion No 23 (Council Letter No 11, this issue of the JOURNAL) has been carried and the week of August 5th-12th is approved as the time for the meeting

67 *Use of the Text of the N F V* Mr Morris Dauer Ph G, Chief Pharmacist, Kings County Hospital, Brooklyn, N Y, has requested permission to partially reproduce the text of the N F V in a Medical Formulary and Prescription Manual. After correspondence with Mr Dauer as to the extent the text would be reproduced, Chairman DuMez of the Committee on Publications writes

"In response to your letter of the 17th instant, I am pleased to note that Mr Dauer does not intend to publish complete working formulas in his Formulary for Physicians. I, therefore, recommend to the Council that permission be granted Mr Dauer to use portions of the text of the National Formulary in the preparation of his Formulary for Physicians, providing he does not publish complete working formulas, and that permission also be granted for the use of National Formulary titles in the posological table to be included in the book. For this privilege I recommend further that the usual fee of \$5 00 be charged "

(Motion No 25) It is moved by DuMez that permission be granted to Mr Morris Dauer to use the text of the N F V for partial reproduction in his Formulary for Physicians under the usual conditions and at the usual charge of \$5 00

68 *Life Membership* The following became Life Members during 1934 through the payment of dues for 37 consecutive years: William L Cliffe, Jesse L Hopkins, Robert S McKinney and Frank X Moerk

The following became Life Members during 1934 through the payment of a fee: Gustav

Bachman, Zada M Cooper, Frank R Eldred, Roland E Kremers, Henry A Langenhan, Martin Larson, Rufus A Lyman and George S Morgan

69 *Year Books for the Library of Congress*
Dr Herbert Putnam, Librarian of Congress, through the Chief Division of Accessions has requested that the Association donate copies of the YEAR BOOKS, Volumes 1-5, 7-12, 14-21 for the files of the National Library

The request was referred to Dr A G DuMez of the Committee on Publications who writes

"It is stated that it is my personal opinion that a full set of the YEAR BOOKS of the AMERICAN PHARMACEUTICAL ASSOCIATION should be in the Library of Congress, and as most of the books contained in that library have been donated I can see no good reason why the AMERICAN PHARMACEUTICAL ASSOCIATION should not donate

the numbers requested by the Librarian of that institution If my memory serves me correctly, we donated almost a complete set of the YEAR BOOKS to the Creer Library not so long ago, which should serve as a precedent for us to follow in this case "

(Motion No 26) It is moved by Kelly that Volumes 1-5, 7-12, 14-21 of the Year Books of the Association be donated to the Library of Congress A vote on this motion will be called for

70 *Bequest by Dr Frederick B Kilmer*
Newspapers and other publications have carried the statement that the will of Dr Kilmer includes a bequest of \$3000 00 as a trust fund to the AMERICAN PHARMACEUTICAL ASSOCIATION, the income from which is to be applied in the form of a prize, to the rewarding of meritorious work in pharmacognosy So far, no official report has been received

E F KELLY, *Secretary*

BIBLIOGRAPHY OF PHARMACEUTICAL RESEARCH—Continued from p 119

Randall, Merle, and Sarquis, Marian N

Microdetermination of lead

Ind Eng Chem, Analyt Edit, 7 (1935), 2

Sa A

New color reaction for the chlorate ion

Anales farm buquim, 5 (1934), 111

Wagenaar, G H

Identification of superol

Pharm Weekbl, 71 (1934) 1122-1124, through

Chem Abstr, 29 (1935), 291

Wagenaar, M

Microchemistry of cinchophen

Pharm Weekbl 71 (1934), 1100-1103, through

Chem Abstr, 29 (1935), 291

Wagenaar, M

Microchemistry of diethylbromoacetylurea (adaline)

Pharm Weekbl, 71 (1934), 1261-1264, through

Chem Abstr, 29 (1935), 545

Weiss, Ludwig

Evaluation of ferrum reductum by the sublimate method

Z anal Chem, 98 (1934) 397-402, through

Chem Abstr, 29 (1935), 292

Willard, Hobart H, and Young Philena

Standardization of potassium dichromate

Ind Eng Chem, Analyt Edit, 7 (1935), 57

Willson, Virgil A

Determination of available chlorine in hypochlorite solutions by direct titration with sodium thiosulphate

Ind Eng Chem, Analyt Edit, 7 (1935), 44

INORGANIC AND PHYSICAL CHEMISTRY

Lancien A and Pivoteau, M

Contribution to the study of colloidal solutions

Bull sci pharmacol, 36 (1934), 660

Russell, E R

Presence of arsenic in bismuth preparations

Arch Dermatol Syphilol, 28 (1934), 841-842,

through *Chem Abstr*, 29 (1935), 290

ORGANIC CHEMISTRY

Bird, John C, Panciera Z, and Shafer, E G E

Alpha-Dinitrophenol, its purification with qualitative and quantitative data

Am J Pharm, 106 (1934), 462

Lowry T Martin

Tartrates and Racemates

J Soc Chem Ind, 54 (1935) 28

Morgan, Gilbert T, and Pettet, Alfred, E J

Molecular compound of phenols

J Soc Chem Ind, 54 (1935), 22T

Offerhaus, C, and Baert, C G

Anaesthetics, particularly Cocaine and Novocaine

Pharm Weekbl, 71 (1934), 1401

Van Itallie, E I

Review of new researches on pectin

Pharm Weekbl, 72 (1935), 2, 25

CLINICAL TESTS

Cholak Jacob

The quantitative spectrographic determination of lead in urine

J Am Chem Soc, 57 (1935), 104

EDITORIAL NOTES

AN UNFORTUNATE ERROR

A patient at the George Washington University Hospital lost her life as a result of administration of formaldehyde. This brief mention of the unfortunate error is made, as statements regarding the occurrence differ. The coroner's jury placed the responsibility for the error on the pharmacist (Miss Blannie Bennet), however, other information differs from the findings. The latter stated that the 5 pound bottle from which she poured the solution was new and bore a paraldehyde label. Another patient in the same section suffered from the same poisoning, but recovered.

PUBLIC HEALTH PROFESSORSHIP

The first professorship in public health has been established in the University of Munich. Professor Dr. Schultze, the new state commissioner for public health in Bavaria, has been appointed lecturer. In his inaugural he pointed out first the negative side of his professorship, namely, combating the errors in medicine due to specialization. The problems of the new discipline in science are, as he stated, racial supervision, dwelling and colonization problems, social insurance and determination of the useful in folk remedies, the single great objective being that public health is political power.

IMPERIAL BOTANICAL CONFERENCE

An Imperial Botanical Conference, commencing on August 28th and lasting two or three days, will be held in London this year. The subjects set down for discussion are of general interest to Empire botanists. The *Kew Bulletin*, in announcing the Conference, hopes that it will furnish a convenient meeting ground for home and overseas botanists who are on their way to attend the International Botanical Congress which meets at Amsterdam in the week following. The Director of the Royal Botanic Gardens, Kew, is the chairman of the Organizing Committee of the Conference, and the honorary secretary is Professor W. Brown. Imperial College of Science and Technology, South Kensington, London, S W 7, from whom further particulars may be obtained.

FOURTH INTERNATIONAL HOSPITAL CONGRESS IN ROME

The International Hospital Association an-

nounces that the fourth International Hospital Congress will take place in Rome from May 5-12, 1935. The Italian Government has extended a most cordial welcome to the Association, so that the visit to Rome is assured of being a most memorable one in every respect. The full program, giving all details of the Congress and of the study trips which will take place before and after the Congress, will be issued within a few weeks. The International Hospital Association requests government health departments, national associations and the press to give publicity to the Congress and to encourage a large attendance. The Association also expresses the hope that all who are interested in its work will endeavor to fit the Congress into their program of travel for 1935.

VACATION COURSES OF THE UNIVERSITY OF HEIDELBERG

The University of Heidelberg has provided vacation courses for those from foreign countries who desire to take part in one or the other of these special courses.

AUSTRIAN PHARMACEUTICAL SOCIETY

The Austrian Pharmaceutical Society held its annual session in its building in Vienna. The usual order of business was carried out. Among the addresses was one by Professor Dr. H. Mark. The secretary of the organization is Dr. Hans Heger and the honorary president is Dr. Richard Firbas.

CENTENNIAL CELEBRATION AT TULANE

The one hundredth anniversary of the establishment of Tulane University of Louisiana School of Medicine, New Orleans, was commemorated in a program sponsored by the Orleans Parish Medical Society, January 7th. This observance is a forerunner of the celebration planned by the University in June for three or four days, culminating on commencement day, June 12th. The recent program marked the actual day of its founding, the first Monday in January, 1835. The history of the institution was reviewed by Mayor T. Semmes Walmsley, and Drs. Charles C. Bass, dean, Waldemar R. Metz, Albert E. Fossier and Randolph Matas.

PERSONAL AND NEWS ITEMS.

THIRTIETH ANNIVERSARY OF THE
COUNCIL ON PHARMACY AND
CHEMISTRY

On February 11th, the Council on Pharmacy and Chemistry completed its thirtieth year of service. During the greater part of this period, our late fellow member, W. A. Puckner, served as its secretary. The present secretary of the Council is Dr. Paul Nicholas Leech, a member of the AMERICAN PHARMACEUTICAL ASSOCIATION. President R. P. Fischelis sent a congratulatory telegram to the American Medical Association.

TWEIFTH INTERNATIONAL CON-
GRESS OF PHARMACY

The 12th International Congress of Pharmacy is to be held in Brussels July 30th, to August 5, 1935, under the auspices of the International Pharmaceutical Federation, Belgium Pharmaceutical Association and the Pharmaceutical Society of Anvers. Pharmacist J. Breugelmans of Brussels, *Secretary*, states that an invitation has been extended to the U. S. Government to be represented and pharmacists of the United States are invited. Further information will later be mailed. The *JOURNAL* Entertainment features and plans for visitations have been arranged. Those contemplating to attend should address Dr. J. Breugelmans, General Secretary, 3 rue du Gouvernement Provisoire, Brussels, Belgium. Further information will be given in a succeeding number of the *JOURNAL*.

BULLETIN OF THE INTERNATIONAL
FEDERATION

The number of the *Bulletin* issued December 28, 1934, contains reports of the Committee on Specialties, information relative to the Pharmaceutical Congress to be held in Brussels in 1935. Regulations governing the Practice of Pharmacy in various countries—Belgium, Czechoslovakia, Egypt, Great Britain, Hungary, Netherlands, Poland, United States, Spain, Sweden, Bucharest, Rumania. An article by Col. J. Thomann, of Berne, discusses Military Pharmacy, another is devoted to the Centenary of Dr. Charles Davilla. The number concludes with rosters of pharmaceutical activities in Germany, United States, Belgium, Finland, France, Great Britain,

Hungary, Latvia, Luxemburg, Netherlands, Sweden, Switzerland and Czechoslovakia.

Secretary General J. Breugelmans and Secretary T. Potjewijd have made a very valuable contribution by the publication of this number of the *Bulletin of the International Pharmaceutical Federation*.

John P. Jelinek, of St. Paul, is completing his second year as president of the Northwest Pharmaceutical Bureau under whose auspices the Northwest Drug Show is held annually. Mr. Jelinek will conduct the bureau conference at a 6 o'clock dinner, Wednesday, February 20th.

Miss Mary A. Fein, of Little Rock, Ark., has a record of long service as secretary of Arkansas Pharmaceutical Association. The 25th anniversary of her incumbency received wide recognition from pharmacists and State pharmaceutical associations. While no longer secretary, her interest in pharmacy continues and she is a frequent visitor to adjoining State associations and is an occasional visitor at meetings of the AMERICAN PHARMACEUTICAL ASSOCIATION.

Her service was given publicity after the election of Miss Alice Garvin to succeed her lamented father, Patrick J. Garvin.

Charles H. LaWall is on the program for an address on Pharmacy and Early Pharmacy, to be delivered at the Widener Branch of Free Library, Philadelphia.

Paul C. Olsen has recently completed a careful factual study of the results of stabilization in a typical retail drug store. We enclose a mimeograph copy of his report which he has just handed to us. Dr. Olsen advises that he is working up similar studies on the results obtained in other typical stores.

It would appear from this study by Olsen and a few other critical researches that have been conducted, that there is a whole lot more to say in favor of stabilization to day than ever before.

Frederick W. Connolly, Boston, Mass., has presented to the AMERICAN PHARMACEUTICAL ASSOCIATION a formulary of the London Hospital for the treatment of skin diseases. The staff of the hospital includes a pharmacist, the year of issuance is 1850.

OBITUARY

CHARLES M BLANEY

Charles M Blaney, member of the AMERICAN PHARMACEUTICAL ASSOCIATION, and a retired pharmacist of Baltimore, died January 16th, aged fifty-six years. After his retirement Mr Blaney gave much of his time to aiding others in various pharmaceutical activities. He contributed toward the Headquarters fund and after the building was completed donated a number of articles for the Museum.

Mr Blaney was a member of the Maryland Pharmaceutical Association of the Baltimore Retail Druggists' Association, and the Veteran Druggists' Association. He was deeply interested in the U S P and N F revision work.

The Baltimore Veteran Druggists' Association attended the funeral in a body.

W L CLIFFE

William L Cliffe, member of the AMERICAN PHARMACEUTICAL ASSOCIATION and active in pharmaceutical affairs, both national and state, died suddenly, February 4th, at his home in Frankford, Pa (Philadelphia). After completing his early school education he was apprenticed with F H Basset in Frankford. In 1882, he matriculated at the Philadelphia College of Pharmacy and graduated in 1884, after graduation he engaged in business on his own account at Kensington Avenue and Somerset Street.

Mr Cliffe took a leading part in college activities and served the Alumni Association as president and in other offices, and the college as a member of its board of trustees and active on its committee of instruction and of education, rendering most valuable service.

He was a former president of Pennsylvania Pharmaceutical Association, a member of the State Board of Pharmacy and a former vice president of the AMERICAN PHARMACEUTICAL ASSOCIATION. He had a part in all of these organizations in their efforts for promoting pharmacy. The writer, a classmate, valued his friendship highly.

The deceased is survived by his widow.

EDGAR A RIDGELY

Edgar A Ridgely, president of the Indiana Pharmaceutical Association, died January 24, 1935, following an attack of Angina pectoris. Mr Ridgely was attending a testimonial dinner to a fellow-member, E C Went, newly elected Mayor of Mishawaka. Mr Ridgely was scheduled as one of the speakers of the occasion presided over by Harry Noel as toastmaster.

Mr Ridgely was born near Olney, in Southern Illinois, where he received his early education and later attended the Southern Collegiate Institute at Albion, from which institution he graduated. After teaching for several years he matriculated at Valparaiso University, from where he graduated in 1902. After graduation he served for a time as drug clerk and then entered business on his own account in East St. Louis. He afterward located in Gary, Indiana.

Mr Ridgely was interested in civic affairs and active in Indiana Pharmaceutical Association of which he was elected president last year. Mr Ridgely was 56 years of age and is survived by his widow and three daughters.

E D IRVINE

Ephraim Dinsmore Irvine, honorary member of the Illinois Pharmaceutical Association for many years, and editor and publisher of the *Western Druggist*, afterward known as the *Drug Bulletin*, died at his home in Oak Park, Sunday January 27th, at the age of 68. Mr Irvine was graduated from the Chicago College of Pharmacy in 1893 as an honor student and was president of his class. He was for a time engaged in the drug business in North Dakota but returned to Chicago and became a member of the teaching staff of the college, as assistant to Professor Hallberg. Shortly afterward he joined the *Western Druggist* staff and upon the death of G P Engelhard succeeded to the editorship and ownership of that journal. He has been a member of the Chicago Veteran Druggists' Association since 1920. He leaves a wife and daughter. The funeral services were held at the family residence 725 Clinton Street, Oak Park, and the members of the Chicago Veteran Druggists Association attended in a body—
WM B DAY, Dean

SOCIETIES AND COLLEGES

EIGHTY-THIRD ANNUAL MEETING
AMERICAN PHARMACEUTICAL
ASSOCIATION AND AFFILIATED
ORGANIZATIONS

The Council of the AMERICAN PHARMACEUTICAL ASSOCIATION has approved the week of August 5th to 10th as the time and the Hotel Multnomah, Portland, Ore., as the headquarters for the 1935 meeting

The North Pacific Branch of the A P H A will have direct charge of arrangements for the meeting under the supervision of Local Secretary Dean A O Mickelsen, North Pacific College of Pharmacy, Portland, and with the active coöperation of committees representing the pharmacists of Oregon, Washington Idaho, California and Montana This is the first time that the A P H A has met in this section and every effort is being exerted to make it an outstanding event

The pharmaceutical associations of Oregon, Washington and Idaho will hold their annual meetings, jointly, in Portland on Monday and Tuesday, August 5th and 6th, which will add greatly to the interest and attendance at this unusual pharmaceutical gathering

The Plant Science Seminar and the National Conference on Pharmaceutical Research will hold their annual meetings the previous week, the latter on Saturday, August 3rd The National Association Boards of Pharmacy and the American Association Colleges of Pharmacy will hold their annual meetings, as usual, on Monday and Tuesday, August 5th and 6th

A joint banquet for all groups including those attending the state association meetings, is scheduled for Tuesday evening, August 6th

The sessions of the A P H A, including those of the Conference of Pharmaceutical Association Secretaries and of the Conference of Pharmaceutical Law Enforcement Officials will occupy Wednesday, Thursday and Friday, closing Friday evening

On Saturday, all visitors will be taken on an all day trip by bus, over the famous Columbia River Highway during which an out-door luncheon will be served Other entertainment features will be scheduled during the week and every opportunity provided to see the many unusual points of interest in this wonderful section of our country

The arrangements for the various business sessions and the entertainment features will be announced as they are completed in a series

of news bulletins to be issued by the Committee on Publicity

The American Chemical Society will hold its summer meeting in San Francisco during the week of August 19th, which will be very convenient for those who wish to also attend this meeting with a week in between to sightsee

Portland has ample hotel facilities for the convention The Hotel Multnomah will be given over to the business sessions and entertainment of the delegates and visitors to the A P H A and related organizations The headquarters of the state associations will be located in other hotels within easy access to the Multnomah so that visiting will be easy

The Committee on Transportation of the A P H A will soon have an important announcement in reference to rates and time The certificate plan will not be necessary because of the unusually low round trip or single rates including choice of routes and full stop over privileges A variety of interesting side-trips will be offered at low cost Parties to travel together are being made up in various centers and special train accommodations will be offered from Chicago and other points

The automobile roads are excellent and the accommodations for those who prefer to travel this way are fine Many scenic attractions can be visited by automobile more conveniently and a diversity of routes is available

This annual meeting will be an exceptional one from the standpoint of program and attendance A very interesting section of our country can be seen with every convenience and at reasonable cost and during the most favorable period of the year The annual meetings of the three state associations will provide the unusual opportunity of meeting the pharmacists of this entire section

SECTION AND CONFERENCE PAPERS
FOR THE PORTLAND MEETING OF
THE AMERICAN PHARMACEUTICAL
ASSOCIATIONS

The time is approaching for preparing papers and reports for the Portland meeting The list of officers may be found in the roster, for your convenience the names of the presiding officers and secretaries are here given Scientific Section, *Chairman*, E V Lynn, Massachusetts College of Pharmacy, Boston, *Secretary*, F E Bibbins, 5840 Washington Blvd, Indianapolis Ind Section on Education and

Legislation, *Chairman*, Oscar E Russell 531 So Main St, Elkhart, Ind, *Secretary*, L W Rising, University of Washington, Seattle, Wash Section on Practical Pharmacy and Dispensing, *Chairman*, H M Burlage University of North Carolina, Chapel Hill, N C, *Secretary*, Leon W Richards, University of Montana, Missoula, Mont Section on Commercial Interests, *Chairman*, Henry Brown, Scranton, Pa, *Secretary*, R T Lakey, Cass & Hancock Aves, Detroit, Mich Section on Historical Pharmacy, *Chairman* C O Lee, Purdue University, La Fayette, Ind, *Secretary*, H W Youngken, Massachusetts College of Pharmacy, Boston, Mass, *Historian*, E G Eberle, 2215 Constitution Ave, Washington, D C

National Conference on Pharmaceutical Research, *Chairman* E N Gathercoal 710 So Wood St, Chicago, Ill, *Secretary*, John C Krantz, Jr, 2411 No Charles St, Baltimore, Md Conference of Pharmaceutical Association Secretaries, *President*, F V McCullough, New Albany, Ind, *Secretary*, Carl G A Harring, 20 Glen Road, Newton Center, Mass Conference Pharmaceutical Law Enforcement Officials, *Chairman*, R L Swain, 2411 No Charles St, Baltimore Md *Secretary* M N Ford, New State Office Building, Columbus, Ohio Plant Science Seminar, *Chairman*, Frank H Eby, 240 Powell Road, Springfield, Pa, *Secretary*, F J Bacon, Western Reserve University Cleveland, Ohio

American Association of Colleges of Pharmacy, *President*, Ernest Little, Rutgers University College of Pharmacy, Newark N J *Secretary*, Zada M Cooper, University of Iowa, College of Pharmacy, Iowa City, Ia, *Chairman of Executive Committee*, C B Jordan Purdue University La Fayette, Ind

National Association of Boards of Pharmacy, *President*, C H Evans, Warrenton, Ga, *Secretary*, H C Christensen, 130 No Wells St Chicago Ill

SECTION ON HISTORICAL PHARMACY

'The officers of the Historical Section earnestly solicit the cooperation of all members and friends of the AMERICAN PHARMACEUTICAL ASSOCIATION as they begin their work in preparation for the historical program for the annual convention of the Association in Portland Oregon

"Our ASSOCIATION has not met in the far west for a number of years and we are anxious to carry a renewed appreciation of the glorious art of the Apothecary of the past into this section

"Modern Pharmacy has been built upon the past and every phase of pharmacy which has transpired, although but recently, is history The stories of drug stores, pharmaceutical manufacturing houses, local or state associations, men and institutions of pharmacy are all within the realm of history Send us the titles and abstracts of your stories at your earliest convenience You are invited to contribute to the Archives of American Pharmacy now housed in the AMERICAN INSTITUTE OF PHARMACY in Washington, D C—HEBER W YOUNGKEN, *Secretary*

PHI DELTA CHI FRATERNITY

The annual meeting of the Grand Council of Phi Delta Chi was held in Baltimore, at the Emerson Hotel, February 7th and 8th

The gala event of the conclave was the Annual Banquet, held February 8th After the close of the conclave many of the fraters visited the AMERICAN INSTITUTE OF PHARMACY

AMERICAN DRUG MANUFACTURERS' ASSOCIATION

Plans for the twenty fourth annual meeting of the American Drug Manufacturers' Association at Hot Springs, Va, May 6th to 9th are in preparation The schedule of sessions places the first general session on May 7th, sessions of the biological, crude drug pharmaceutical and scientific sections will start May 6th The annual dinner is scheduled for May 8th

In his first call for the meeting President A Homer Smith says

This year general and specific problems of unprecedented magnitude have confronted the industry Many of these will be still pending when we assemble at The Homestead There is no better way to approach a satisfactory solution of these pressing issues than through an interchange of ideas on the floor of the convention and through personal contacts It is therefore urged in the interest of all concerned that every member firm arrange now to have present a representative delegation of their technical and business staffs I shall be most grateful for your assurances to this end"

DRUG AND CHEMICAL DINNER

Eight hundred reservations for the tenth annual dinner of the drug, chemical and allied trades to be held March 21st in the Waldorf Astoria New York City, have been received by the Drug, Chemical and Allied Trades section of the New York Board of Trade, which organization sponsors the dinner

NORTH CAROLINA PHARMACEUTICAL ASSOCIATION

The meeting date of North Carolina Pharmaceutical Association has been fixed for May 13th-15th, in the Robert E Lee Hotel as convention headquarters, Winston-Salem Sam C Welfare and M T Lesley have been named Local Secretary and Assistant Local Secretary

NEBRASKA PHARMACEUTICAL ASSOCIATION

Nebraska will hold the fifty-fourth annual convention at the Hotel Cornhusker, Lincoln, February 25th-28th Many problems of legislation will be discussed and decided Speakers of prominence are named on the program

MAINE PHARMACEUTICAL ASSOCIATION

It was voted to hold the Annual Convention at the Rangeley Lakes House, Rangeley, Me , on June 25-28, 1935 The Mid-Winter meeting was held in Augusta, Friday February 15 1935

A suggestion of forming a Council of Pharmacy, in which every section of the State will be represented was accepted and the Executive Committee will proceed at once to get the Council organized and ready to function The purpose of this Council of Pharmacy is to create more interest in Pharmacy in the State, and to create a better spirit of cooperation among the Druggists of the State The tentative plan for the organization of the Council of Pharmacy is for the President, B K Murdock, to appoint two members from each county to form the Council, which is to elect two members to serve on the executive committee of the Maine Pharmaceutical Association

PUERTO RICO PHARMACEUTICAL ASSOCIATIONS

The Board of Directors of Puerto Pharmaceutical Association is composed of *President*, Alberto Pelegrina, San Juan, *Vice-President*, Candido A Martinez, Caguas, *Secretary Treasurer*, Ramon Lopez Irizarry, San Juan, *Counsellors* Angel M Diaz, Hector Urrutia Carlos G Gonzalez, Francisco L Anselmi, Antonio Maisonave, Armando Arroyo, Juan T Puig, Zoilo Zotomayor, Francisco Sosa Perez, Raul Acosta, Victoriano Pagan Colon Enrique Angalde Luis R Emanuelh, V M Colon

Members of the State Board of Pharmacy are *President*, Ramon Lopez Irizarry, San

Juan, *Secretary*, Washington Llorens, Arecibo, *Treasurer*, Lumen M Mendez, Lares, Luis A Torregrosa, San Juan, Sergio Seijo Arecibo

Report of the Director of the School of Tropical Medicine of the University of Puerto Rico, under the auspices of Columbia University for the year ending June 14, 1934 Published by the University of Puerto Rico and Columbia University, 67 pages

PROPOSALS AFFECTING PHARMACEUTICAL PROFESSION IN THE PHILIPPINE ISLANDS

Two important proposals which would materially affect the pharmaceutical profession in the Philippine Islands are being studied by the board of pharmaceutical examiners, upon the recommendation of the Philippine Pharmaceutical Association

The first proposal would confine the practice of pharmacy in the Philippines exclusively to Philippine and American citizens Its purpose is to nationalize the profession, and protect Philippine pharmacists This plan, which will be brought before the Legislature, will not however, affect foreign subjects now practicing pharmacy in the Philippines

The second plan provides that all pharmacy and drug store owners shall be graduates of pharmacy schools This is in accordance with the system followed abroad, where only regular pharmacists are allowed to own drug stores it was declared

On July 25th, the board of pharmaceutical examiners, at its regular monthly meeting approved the proposal to make the sale of household remedies exclusive to American or Philippine residents who have resided in the Islands at least one year before the filing of application with the board All applicants should be of good character, should not suffer from contagious diseases, and should have passed prescribed examinations (Acting Trade Commissioner Carl H Boehringer, Manila)

The following officers of Philippine Pharmaceutical Association have been elected *President*, Apolonio R Chaves, *First Vice President*, Alfredo C Santos, *Second Vice-President*, José E Jimenez, *Secretary*, Antonio Belmonte, c/o Manila College of Pharmacy, Manila *Assistant Secretary*, Victorio C Dionisio, *Treasurer*, Pedro C Batallones, *Assistant Treasurer*, Remedios Reynado *Board of Directors* Pedro T Maglalang, Petrocino Valenzuela, Florencio Gavino, José V Gloria,

Delfin Santos Ocampo, Antonio G Llamas, Felipe J Concepcion, Servando de los Angeles

OFFICERS OF THE JAPAN PHARMACISTS' UNION

At the 13th general meeting of the Japan Pharmacists' Union, held January 18th and 19th, in Tokyo, Dr Kametaro Kawai was reelected president, the vice presidents are Kimyiro Ishu and Buro Ogmura. President Kawai considered national health insurance most important and, unless separation of medical and pharmaceutical practice is brought about pharmacists would be seriously affected, because physicians, without such restrictive provision, would supply medicines and cut deeply into the income of pharmacists.

AMERICAN DRUGGISTS' FIRE INSURANCE COMPANY

The annual meeting of the American Druggists' Fire Insurance Co was held February 11th-13th. This was the 30th anniversary of the company, dinner was served at the Cincinnati Club and Dr James H Beal was persuaded to deliver an address on Abraham Lincoln.

The following officers were elected: *President*, Charles H Avery, *Vice-President*, James H Beal, *Secretary and General Counsel*, Frank H Freericks, *Assistant Secretary*, W P Starkey, *Treasurer*, Walter Rothwell, *Assistant Treasurer*, E H Thiesing.

LEGAL AND LEGISLATIVE

THE COPELAND BILL

An amended form of the Copeland bill (S 5) was submitted to the Senate committee on commerce by the chairman, Senator Royal S Copeland, February 13th, and assigned to a sub committee for public hearings, consisting of Senator Bennett Champ Clark, of Missouri, Chairman, Senator Hattie W Caraway, of Arkansas, and Senator Charles L McNary, of Oregon. The sub-committee has not yet set a date for hearings, but has promised that it will give ample notice.

The title of the bill has been changed to read "An Act to prevent the adulteration, misbranding and false advertising of food, drugs and cosmetics in interstate, foreign and other commerce subject to the jurisdiction of the United States, for the purposes of safeguarding the public health and preventing deceit upon the purchasing public."

The variation clause is changed only by striking out two phrases, one covering names which "simulate" those recognized in an official compendium, and the other reading "If it fails to meet the definition and description set forth therein."

The definition of adulterated drugs and cosmetics now includes "If it consists in whole or in part of any filthy, putrid or decomposed substance, or if it has been prepared, packed or held under insanitary conditions whereby it may have become contaminated with filth, or whereby it may have been rendered injurious to health, or if its container is composed

of any poisonous or deleterious substance which may render it injurious to health."

The requirement for "explicit" directions for use has been changed to "adequate" directions for use.

Where the original bill made a drug misbranded "if its name is the same as, or simulates, a name recognized in an official compendium and is not packaged and labeled as described therein," the new language reads "If its name is recognized in an official compendium, or it purports to be a drug the name of which is so recognized."

COMPULSORY SICKNESS INSURANCE OPPOSED BY AMERICAN MEDICAL ASSOCIATION

According to the Press reports of February 16th, the American Medical Association reiterated its vigorous opposition to compulsory sickness insurance plans being studied by the President's Committee on Economic Security. But it tempered its stand by approving projects for setting up systems of voluntary illness insurance on a community basis.

Decrying what it termed attempts to regiment the profession in proposed legislation and attacking certain sections of the Wagner bill embodying the national administration's social security program, the Association's house of delegates adopted a declaration of policy for its 100,000 member physicians.

The report, carried unanimously at the sec-

and extraordinary session in the organization's history, set forth

"The house of delegates of the American Medical Association reaffirms its opposition to all forms of compulsory sickness insurance whether administered by the Federal Government, the governments of the individual States or by any individual industry, community or similar body. It reaffirms also its encouragement to local medical organizations to establish plans for the provision of adequate medical service for all of the people, adjusted to present economic conditions by voluntary budgeting to meet the costs of illness."

The statement pointed out more than 150 plans for medical service were undergoing study and trial in various communities and added:

"Your Bureau of Medical Economics is ready and willing to advise medical societies in the creation and operation of such plans. The plans will serve the people of the community in the prevention of disease, maintenance of health and with curative care in illness. They must meet apparent economic factors and safeguard the medical profession."

"The House of Delegates emphasizes the necessity for separate provision for hospital facilities and physicians' services. Payment for medical service, whether by prepayment plans, instalment purchase or voluntary hospital insurance plans, must hold, as absolutely distinct, remuneration for hospital care on one hand and the individual, personal scientific ministrations of the physician on the other."

The association's trustees were urged to request the Bureau of Medical Economics to "study further plans now existing and developing with special reference to the way in which they meet the needs of their communities, costs of operation, quality of service, effect of such service on the medical profession, the applicability to rural, village, urban and industrial population and to develop for the association's June meeting model plans adapted to the needs of populations of various types."

NRA EXTENSION ASKED BY PRESIDENT ROOSEVELT

President Roosevelt, on February 20th, called on Congress to extend the National Industrial Recovery Act for a period of two years from June 16th.

In a message read to both Houses he declared: "The fundamental purposes and principles of this act are sound. To abandon them is unthinkable. It would spell the return of industrial and labor chaos."

While admitting that there should be amendments to the present law, the President laid down certain specific benefits which, he said, have accrued and which must not be abandoned. He listed among these: the abolition of child labor, the establishment of maximum hours of work and of minimum wages, the right of the workers to collective bargaining and the freeing of industry from dishonorable competition.

HOUSE ELIMINATES HEALTH INSURANCE PROVISION OF THE WAGNER-LEWIS BILL

The House Ways and Means Committee has given consideration to the Wagner-Lewis bill during the past month. An important change was made in eliminating relief insurance from the measure.

Apparently at the request of critics of State medicine the committee deleted from the bill authority for the projected Social Insurance Board to study and recommend legislation to afford economic security through health insurance.

Observers recalled health insurance was not included in the report of the President's economic security committee on which the Wagner-Lewis bill was based.

MARIJUANA

S 53, Montana, to amend the law prohibiting the production, distribution or possession of marijuana, proposes to make a violation of the act a felony, punishable by imprisonment in the penitentiary for from one to five years and/or a fine of from \$500.00 to \$1000.00. A Maryland amendment of the narcotic bill relates to prohibition of marijuana. The statement is made that cigarettes containing the narcotic are sold.

ARKANSAS

Arkansas introduced H 105, apparently to supplement the pharmacy practice act, proposing (1) to define drugs as "any drug or compound listed in the United States Pharmacopoeia or National Formulary, or both, which are used for the prevention, mitigation or cure of disease," (2) "to prohibit the distribution of drugs, as defined, except by registered pharmacists," (3) "to permit the board of pharmacy to enjoin the operation of any store not complying with the pharmacy laws." H 110 and S 67 propose "to repeal the laws regulating the possession and distribution of narcotic drugs and to enact what the drafts-

men of these bills cite as the uniform narcotic drug act " The bills however, differ from the model uniform narcotic drug act in some important particulars and contain obvious errors in phraseology They omit the provisions in the model bill intended to limit the gross quantity of a habit-forming drug a person can buy in exempt preparations within a period of forty eight hours

INDIANA

H 113 proposes "to authorize the state board of pharmacy to appoint a narcotic inspector to enforce and to collect information necessary to enforce, the state and federal laws relating to narcotic drugs " S 83 proposes to repeal the laws regulating the distribution and possession of narcotic drugs and to enact what apparently is the uniform narcotic drug act " S 118 to amend the workmen's compensation act H 211 proposes to authorize counties, cities and towns to supply insulin free of charge to citizens who are in need of insulin treatment for diabetes and who are financially unable to purchase the drug

ARIZONA

H 19, Arizona, proposes to enact a new pharmacy practice act Apparently this bill proposes to prohibit physicians from dispensing drugs and medicines but permits them to administer personally "drugs and medicines carried or kept for emergencies in order to supply the immediate needs of their own patients "

MISSOURI

H 73, Missouri, proposes to forbid the sale or other distribution of acetylsalicylic acid, carbolic acid or iodine except on the prescription of a licensed physician, dentist or veterinarian

MONTANA

S 35, Montana, to supplement the pharmacy practice act, has passed the house, proposing 'to authorize the state board of pharmacy to adopt rules requiring registered pharmacists to keep a record of all poisons sold or disposed of containing the signatures of the purchasers and such other information as may be required by the board "

BOOK NOTICES AND REVIEWS

Toxicologie Moderne A L'Usage des Étudiants en Médecine et en Pharmacie, des Médecins Legistes et des Chimistes Experts By ROGER DOURIS 1935 339 pages, 47 figures Published by Vigot Frères, Paris

Should the pharmacist specialize in toxicology? Conversely, why not? His daily training teaches him much regarding the occurrence properties, reactions, incompatibilities, chemical and pharmaceutical behavior of poisons, and he is required to be familiar with customary antidotes Blyth defined toxicology in the title to his book Poisons Their Effect and Detection " It should be frankly appreciated that the pharmacist is not trained in pathology Therefore, he will not be able to make detailed studies of a pathological nature However, he is very specifically trained in the detection of poisons Professor Douris has prepared a manual not only for medico legal chemists and industrial toxicologists, but also for students of pharmacy and medicine

The book is divided into eight distinct parts The first four chapters discuss general aspects of poisoning, variations in toxicity according to methods of administration, relationship of age and method of administration to effect, trans-

formation within the organism and tabulate a series of antidotes The second part contains fourteen chapters dealing with the method of collecting viscera, tests for the metallic poisons and methods of extraction of organic poisons and alkaloids A brief chapter discusses methods of physiological identification This section closes with a discussion of poisonous gases and corrosives A series of excellent tables indicates the detailed procedures to be followed in separation and identification of inorganic and organic poisons

The third portion gives specific methods to be used in testing for various organic or inorganic poisons, both chemically and by physiological methods, and lists the toxic and the lethal doses of many of these products In this chapter ureides, barbituric acid compounds, glucosides, alkaloids, ptomaines and metallic poisons are discussed in some detail

The fourth section deals with war gases, giving their "nom de guerre" formula, boiling point, physiological action and common adjuvants So far as possible, the toxicity of these products is also recorded The fifth chapter deals with poisons to be sought in examining drinking water The sixth section

discusses the action of bacterial toxins and of mushrooms. The seventh section deals with medico legal identification of blood, sperm, stomach contents, etc., and is followed by a brief discussion of the toxicological reports submitted in the French Courts.

This book supplements information given by Blyth, by Autenrieth and by Peterson, Haimes and Webster. It will prove very useful for pharmaceutical reference purposes.—JAMES C. MUNCH

Annual Survey of Research in Pharmacy, 1933-1934 and Proceedings of National Conference on Pharmaceutical Research, 1933-1934. Edited by JOHN C. KRANTZ, JR., Secretary Press of The John D. Lucas Printing Co., Baltimore.

Secretary John C. Krantz, Jr., has presented an annual volume which shows his usual care and the research subjects reported speak well for pharmacy. The subjects are arranged in alphabetical order under 'Specific Problems' and "General Problems" and the former 228 in number and the latter are listed under Bibliography, Botany and Pharmacognosy, Pharmaceutical Economics, Pharmaceutical Education, Pharmaceutical History, Pharmaceutical Law, Pharmaceutical Publications, Pharmaceutical Inter-Relationships, Pharmaceutical Retail Studies, Revision Studies, N F, Revision Studies, U S P and Miscellaneous. The latter include general, directing and general biological research, household products, medicinal chemicals, medicinal organo-metallic compounds, organic research and synthesis, pharmaceutical research and physical-chemical research.

The Table of Contents lists 18 titles, the Preface concisely relates the functions of the National Conference of Pharmaceutical Research and refers to its accomplishments and aims. The contributors are to be congratulated for their work which the Editor has ably presented in this volume. The book contains 170 pages.

The Therapy of the Cook County Hospital. Edited by BERNARD FANTUS, M.D., Chicago.

In their elaboration these articles are submitted to the members of the attending staff of the Cook County Hospital by the director of therapeutics, Dr. Bernard Fantus. The views expressed by various members are incorporated in the final draft for publication. The series of articles will be continued from time to time in the *Journal of the American Medical Association*.

Lea & Febiger, Memorial Volume—This sketch was originally prepared by Henry Charles Lee in 1885, commemorating the one hundredth anniversary of the founding of Lea & Febiger. It has now been revised and amplified and the title changed to conform to the present anniversary—the completion of the 150 years of continuous business activities. The volume contains a number of interesting illustrations, among them the copy of a check returned to General LaFayette on the occasion of a second visit to the United States in 1824 for the sum of \$400.00, upon which the business had been started. There is also a copy of a letter from Washington to Matthew Carey and a copy of Carey's first publication of the *Pennsylvania Evening Herald*.

Proceedings of the 60th Regular Meeting of the National Wholesale Druggists' Association, held at White Sulphur Springs, W. Va., October 1-4, 1934. Former proceedings have been noted in these columns; this report in a general way follows the plan. Much information of value to all readers is contained in these pages relating to laws and business practices. The volume includes the fair trade practices for wholesale druggists discussed in Chicago on December 6, 1934, briefly referred to in the December JOURNAL, page 1252. Publications obtainable through the N.W.D.A. are listed, also bulletins of the statistical division, of the Druggists' Research Bureau, 1928-1929, case studies by the latter, numbering 256 reports. In addition to the records, the addresses and reports contain valuable information relating to all divisions of the drug industries.

We are in receipt of the following dissertations for the Doctor's degree:

Beiträge zur mikroskopischen Diagnostik der Gemüse, Leguminosenhülsen, Wurzel und Knollengemüse, Blatt und Stängelgemüse, Dissertation zur Erlangung der Doktorwürde der Mathematisch - Naturwissenschaftlichen Fakultät der Hamburgischen Universität. Vorgelegt von Hans Volger aus Braunlage (Oberharz) Hamburg, 1934. (Dr. G. Brede-mann).

Beiträge zur Chemie des Gummigutts (Gamboge). Inaugural-Dissertation zur Erlangung der philosophischen Doktorwürde. Vorgelegt der Mathematisch - Naturwissenschaftlichen Abteilung der Philosophischen Fakultät der Universität Basel, von Martha Furrer Apothe-

lerin aus Basel (Dr H Zornig and Dr P Casparis)

Beiträge zur Pharmakognosie der Lilufloren, Anatomie des Laubblattes Inaugural-Dissertation zur Erlangung der philosophischen

Doktorwürde vorgelegt der Mathematisch Naturwissenschaftlichen Abteilung der Philosophischen Fakultät der Universität Basel von Paul Schonman, Apotheker aus Basel (Dr H Zörnig and Dr G Senn)

NOTICE TO CONTRIBUTORS TO THE JOURNAL AMERICAN PHARMACEUTICAL ASSOCIATION.

The following notice has been prepared from comments received from members of the Board of Review of Papers and of the Publication Committee

Manuscripts should be sent to Editor E G Eberle, 2215 Constitution Ave, N W, Washington, D C

All manuscripts should be typewritten in double spacing on one side of paper 8½ x 11 inches, and should be mailed in a flat package—not rolled The original (*not* carbon) copy should be sent The original drawings, not photographs of drawings, should accompany the manuscript Authors should indicate on the manuscript the approximate position of text figures All drawings should be marked with the author's name and address

A condensed title running page headline, not to exceed thirty-five letters, should be given on a separate sheet and placed at the beginning of each article

The method of stating the laboratory in which the work is done should be uniform and placed as a footnote at end of first page, giving Department, School or College The date when received for publication should be given

Numerals are used for figures for all definite weights, measurements, percentages and degrees of temperature (for example 2 Kg, 1 inch, 20.5 cc, 300° C) Spell out all indefinite and approximate periods of time and other numerals which are used in a general manner (for example one hundred years ago, about two and one-half hours, seven times)

Standard abbreviations should be used whenever weights and measures are given in the metric system, *e g* 10 Kg, 2.25 cc, etc The forms to be used are cc, Kg, mg, mm, L and M

Figures should be numbered from 1 up, beginning with the text figures (line engravings are always treated as text-figures and should be designed as such) and continuing through the plates The reduction desired should be clearly indicated on the margin of the drawing All drawings should be made with India ink, preferably on white tracing paper or cloth If coördinate paper is used, a blue-lined paper must be chosen Usually it is desirable to ink in the large squares so that the curves can be more easily read Lettering should be plain and large enough to reproduce well when the drawing is reduced to the width of a printed page (usually about 4 inches) Photographs intended for half tone reproduction should be securely mounted with colorless paste

"Figure" should be spelled out at the beginning of a sentence, elsewhere it is abbreviated to "Fig," per cent—2 words

The expense for a limited number of figures and plates will be borne by the JOURNAL, expense for cuts in excess of this number must be defrayed by the author

References to the literature cited should be grouped at the end of the manuscript under the *References* The citations should be numbered consecutively in the order of their appearance (their location in the text should be indicated by full-sized figures included in parentheses) The sequence followed in the citations should be Author's name (with initials), name of publication volume number, page number and the date in parentheses Abbreviations for journals should conform to the style of *Chemical Abstracts*, published by the American Chemical Society

(1) Author, A Y, *Am J Physiol*, 79, 289 (1927)

Papers presented at the Sections of the AMERICAN PHARMACEUTICAL ASSOCIATION's annual meeting become the property of the Association and may at the discretion of the Editor be published in the JOURNAL Papers presented at these Sections may be published in other periodicals only after the release of the papers by the Board of Review of Papers of the JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

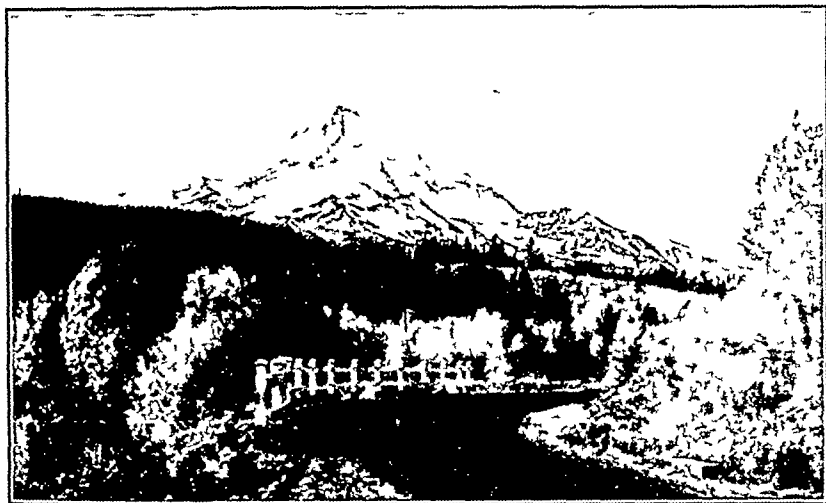
The Editor will appreciate comments from Board of Review and Committee on Publication members, authors and others interested

1935 MEETING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

The week of August 5th-10th has been named for the coming eighty-third annual convention of the AMERICAN PHARMACEUTICAL ASSOCIATION to be held in Portland, Ore. Headquarters will be the Multnomah hotel. A. O. Mickelsen is the Local Secretary and inquiries about the convention should be addressed to him, care of the North Pacific College of Pharmacy, Portland, Ore.

This is the first time the A. P. H. A. will convene in the Pacific Northwest, but it has met before on the Pacific coast—once in Los Angeles and twice in San Francisco. Since this organization is the mother of all pharmaceutical associations of the country and draws its membership from all branches of pharmacy, it is expected that the coming conventions will draw large delegations from all sections.

The Mt. Hood Loop Highway, which marks a conquest of man, starts from Portland's doors, circles Mt. Hood towering 11,225 feet into the heavens. The



Mt. Hood in Oregon as seen from the Loop Highway which completely encircles the mountain, the round trip of 175 miles from Portland may easily be made in one day. The mountain itself is practically in Portland's front yard, being only 60 miles due east. Permission to use in JOURNAL A. P. H. A. by Sawyer Scenic Photos, Inc.

world-famed Columbia River Highway starts eastward from the very edge of Portland. It was at Champoege, a little spot on the Willamette 30 miles above Portland, that a provisional government of the Oregon country under the Stars and Stripes was declared on May 2, 1843. At the mouth of the Columbia River a hundred miles from Portland lies Astoria, the first settlement (1811), in Oregon. A few miles beyond lies Seaside, where Lewis and Clark reached the end of the trail. Just across the Columbia from Portland stand Vancouver Barracks, where General Grant and others of his day served as lieutenants and captains. Monuments, statues and shrines mark these places.

A feature of the convention week is the fact that the Oregon, Washington and Idaho State pharmaceutical associations will hold a big tri-state meeting in Portland on August 5th-6th, and it is expected that many of the delegates to this tri-state meeting will remain to participate in the deliberations of the A. P. H. A. group. Further details of these conventions will appear in later issues of THIS JOURNAL.



ANTON HOGSTAD, JR

JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

VOL XXIV

MARCH, 1935

No 3

THE CHAIRMAN, NATIONAL PHARMACY WEEK EXECUTIVE COMMITTEE

Anton Hogstad, Jr, Chairman, National Pharmacy Week Executive Committee was born February 21, 1893, in Neenah, Wisconsin. He graduated from the Philadelphia College of Pharmacy in 1914, being awarded the Clement B. Lowe Materia Medica Prize and the Henry Kraemer Microscopical Prize. Following graduation he remained at his Alma Mater for a period of two years in the Department of Botany and Pharmacognosy, after which he became associated with the former H. K. Mulford Company, in charge of the Hay Fever Department at the Glenolden Laboratories.

In 1917 he was called to the South Dakota State College Division of Pharmacy where he remained for a period of eight years, during which time he inaugurated the Medicinal and Poisonous Plant Garden, as well as engaging in an extensive piece of research involving the origin, physiological rôle and production of Oil of American Wormseed. During 1925-1926 he was the D. F. Jones Fellow in the Biochemical Division, University of Minnesota, continuing his studies in Biochemistry, Colloidal Chemistry and likewise Pharmacology.

In 1926 he was chosen to succeed the late Dr. Henry M. Whelpley as professor of Physiology and Materia Medica at the St. Louis College of Pharmacy, and was at that time appointed Pharmacognosist to the Missouri Botanical Garden, at which institution he inaugurated and developed their present medicinal plant garden.

Five years later he entered the retail field, establishing a well-known prescription shop in St. Louis which experienced an unprecedented success, the success of same being due in a large measure to the unusual methods adopted in rendering members of allied professions a distinct type of professional service.

On January 1, 1931, he became associated with Merck & Co., Inc., in the capacity of Special Assistant to the President, with instructions to render American Pharmacy every assistance possible. Upon the death of the late Dr. Robert J. Ruth, Mr. Hogstad was appointed chairman of the National Pharmacy Week

Executive Committee During the course of the past four years he has traveled extensively, lecturing at Colleges of Pharmacy, local, state and national gatherings throughout the United States and Canada, as well as assisting retail pharmacists by rendering a distinct type of personal service

On June 30, 1920, Mr Hogstad was married to Ebba Henrietta Nesseth at Menomonie, Wisconsin, they have four children Mr Hogstad is keenly interested in the native medicinal plants He is the founder of the St. Louis Wild Flower Club He is also vitally interested in Colloidal Chemistry For four years he addressed the St. Louis Colloidal Medical Club monthly on Colloidal Chemistry in relation to Medicine

PRELIMINARY NOTICE FROM THE COMMITTEE ON TRANSPORTATION

Members attending the meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION in Portland, Oregon, August 5th-10th, will have an opportunity to visit the great west at moderate expense and under unusually favorable conditions The Committee on Transportation is working with the railroads and steamboat companies to the end that members will be able to take advantage of very low summer excursion rates to the coast which will allow a wide choice of routes, going out by any one of many routes and returning by any other, including the whole length of California, Oregon and Washington, either from the north or the south

In making arrangements for transportation, the Committee is endeavoring to leave the widest possible latitude of choice to the members, who may stop over at the Grand Canyon, or Yellowstone Park, or any of several other places, and several tours to Alaska will be available at the end of the meeting Professor Gathercoal, the Chicago member of the Committee, is organizing a special tour from Chicago to the convention, with a stop over at Glacier National Park, and returning through the Canadian Rockies, which members from other sections will be welcome to join More detailed information on transportation arrangements will be given in later notices from the Committee —T J BRADLEY, *Chairman*

ABSTRACT SECTION OF THE JOURNAL

Beginning with this issue of the JOURNAL Pharmaceutical Abstracts will be published in a section near the end of the text pages in 32 page forms The latter are paged consecutively so that they can be taken out of the JOURNAL and bound at the end of the year Those who desire may also purchase duplicate forms or obtain bound copies of them

If a sufficient number of laboratories or individuals desire reprints of the Abstracts, arrangements may be made for furnishing them Replies should be mailed promptly to the Editor, 2215 Constitution Ave., Washington, D. C.

The Abstracts replace those of the YEAR BOOK and as they are published soon after the articles appear in the pharmaceutical publications, it is hoped that they will add to the service given by the ASSOCIATION "The Bibliography of Pharmaceutical Research" heretofore published at the conclusion of the Scientific Section will be discontinued

PAPERS FOR THE SECTIONS OF PORTLAND A. P. H. A. MEETING

Members of the AMERICAN PHARMACEUTICAL ASSOCIATION who contemplate presenting papers at the Portland meeting are referred to page 172 of the February JOURNAL for the names and addresses of officers of the Sections In sending papers carbon copies may be addressed to the JOURNAL, 2215 Constitution Ave., Washington, D. C.

EDITORIAL

E G EBERLE, EDITOR

2215 Constitution Ave , WASHINGTON, D C

INTERNATIONAL CONGRESS OF PHARMACY

AS stated in February JOURNAL the International Pharmaceutical Federation has selected Brussels for the twelfth International Congress of Pharmacy, July 30th to August 5th, coinciding with the Exposition Universelle of 1935. The Congress is under the patronage of King Leopold III. The program of the Congress details the entire domain of pharmaceutical subjects: Galenic pharmacy, pharmaceutical chemistry, analytical chemistry, toxicological chemistry, bromatology, pharmacognosy, microbiology, bacteriology, hygiene, history of pharmacy. The Secretary-General is Pharmacist J. Breugelmans, 3 rue du Gouvernement Provisoire, Brussels. Those who will attend should advise the latter promptly, giving title and profession, title of paper and advise whether it will be illustrated and whether experiments will be made during presentation. Only those articles will be accepted which are received prior to May 30th, as they are to be printed in advance of the meeting of the Congress. The official language of the Congress is French, but reports and communications may be written in any other language.

The Scientific Committee is composed of Prof. A. Castille, University of Louvain, Prof. A. J. J. Van de Velde, University of Ghent, Prof. F. Schoofs, University of Liège, Pharmacist O. Van Schoor, Prof. N. Wattiez, University of Brussels. The secretaries are E. Delvaux, University of Louvain, H. Lecocq, A. Gilkinst, Institute of Pharmacy, University of Liège. The Professional Interests Section is presided over by G. van de Vorst, of the Société de Pharmacie d'Anvers. M. Breugelmans is the editor of *Journal de Pharmacie de Belgique*, the February 17th number contains a complete program of the Congress, part of which includes the entertainment features and information relative to trips that may be taken by visitors. It is hoped that visitors from the United States will arrange their travels for attendance at the meeting.

PAN-AMERICAN MEDICAL ASSOCIATION

THE sixth congress of the Pan-American Medical Association will hold its sessions on board the steamship Columbia, sailing from New York on August 28th. The itinerary includes Havana, Curaçao, Trinidad, Santo Domingo, Jamaica, Rio de Janeiro, Santos and Sao Paulo in Brazil. The activities of the Association represent all branches of medicine, including studies on the United States and pharmacopœias of other American Republics. The Association has provided an award for post-graduate study, this year's selection will be made by the medical profession of Brazil.

The session of 1933 was held in Dallas, Tex., at which time Theodore J. Bradley presided over the Pharmacopœial Section. Chairman E. Fullerton Cook,¹ U. S. P. Revision Committee, presented a plan for coöperation, embodying general principles for an effort to reach an agreement on standards, pharmacopœial uniformity, contacts with the Health Departments of the Republics represented,

¹ JOUR. A. PH. A., 22, 456 (1933)

pharmacopœial information, and to agree upon the adoption of suitable titles and synonyms, and uniform strengths and percentages of purity

The general plans of this year's congress were made March 1st, in New York City at a dinner in honor of Dr Oswaldo Aranha, Brazilian Ambassador to the United States. The possibility of valuable results through cooperation of the divisions of medicine in the American Republics is evident, but systematic and persistent encouragement is essential

DIVISION OF HEALTH SCIENCES

THE regents of the University of Michigan at their meeting in January established a Division of the Health Sciences, which is to consist of the Medical School, the School of Dentistry, the Division of Hygiene and Public Health, the University Hospital School of Nursing, the College of Pharmacy and Post-Graduate Education. The purpose of this new division is to coordinate the work of all the divisions of the University which are concerned with the public health sciences, and the committee of this division is to act in an advisory manner

The faculty of the College of Pharmacy considers that this step is a clear recognition on the part of the regents of the University of the importance of pharmacy as one of the public health sciences

DRUG JARS IN NEW YORK MUSEUM

THE interest of collectors in drug jars is shown in the exhibition at the American Art Association—Anderson Galleries of the collection of the late John Wanamaker. The latter display was in the home of Mr Wanamaker on shelves which have been brought to the Museum, the containers are traced back to the Middle Ages and were made at the great pottery works of that period, such as Urbino, Castle Durante and Faenze, in Italy, and important centers in France, Holland and Spain

Associated with the collection referred to are other specimens, mortars and pestles, some of the bronze mortars show "the interest of the time in ornamenting every day objects." Walter Rendell Storey writes interestingly on the subject in the *New York Times Magazine* of March 3rd, in an article wherein descriptions are given of the jars and mortars, now sought by collectors because of their ornamentation and ceramic importance

DANISH REVIEW OF "PROFESSIONAL PHARMACY"

Svend Nielsen has published an extensive review of "Professional Pharmacy" prepared by Frank A. Delgado and Arthur A. Kimball, under authority of the U. S. Department of Commerce. Daniel C. Roper, *Secretary*, Bureau of Foreign and Domestic Commerce, Willard L. Thorp, *Director*

This review appeared in the *Farmaceutisk Tidende* and is reprinted as a booklet. It affords the Danish pharmacists an opportunity to acquaint themselves with American pharmaceutical activities and exhibits the interest of Dr. Svend Nielsen in the subject. The authors are honored by the recognition and the AMERICAN PHARMACEUTICAL ASSOCIATION appreciates the value placed on the publication by the pharmacists of Denmark.

It may be stated here that the first edition of "Professional Pharmacy" is exhausted and a revision with considerable important additional matter is in preparation

SCIENTIFIC SECTION

BOARD OF REVIEW OF PAPERS—*Chairman*, F E Bibbins, George D Beal, L W Rising, H M Burlage, L W Rowe, John C Krantz, Jr, Heber W Youngken

THE ACTIVE CONSTITUENTS OF ERGOT A PHARMACOLOGICAL AND CHEMICAL STUDY

BY MARVIN R THOMPSON

(*Concluded from January JOURNAL A PH A*, page 38)

THE CHEMICAL ISOLATION OF A HITHERTO UNIDENTIFIED MEMBER OF THE "TOTAL SPECIFIC ALKALOIDS" OF ERGOT

It was believed, after many unsuccessful attempts in various directions, that the most fruitful procedure to follow in attempting to isolate the new promptly acting alkaloid would be to obtain the total alkaloids in as pure a condition as possible, and then to remove all of the alkaloids having the slow ergotoxine or ergotamine type of activity, leaving the promptly acting new alkaloidal principle or principles uncontaminated as far as the known alkaloids are concerned This proved to be a successful procedure

Since the "Total Alkaloidal Fraction" was completely clear and colorless, and since pharmacologic tests had shown this material to contain essentially every trace of the significant activity of the drug, this activity residing wholly in the "total alkaloids" as tartrates, this solution provided an excellent starting point Accordingly 1 Kg of defatted Ergot was worked up to this point in the previously described manner This colorless acid aqueous solution was then again alkalinized and exhaustively shaken out with many small portions of ether The Smith colorimetric test and pregnant cats were extensively used to follow the extractions to prevent loss of alkaloids As usual, all operations were carried out in the dark to prevent oxidation of these labile substances The ethereal solution was then taken to complete dryness *in vacuo* first over CaCl_2 , then over P_2O_5 without heat

This dry amorphous total alkaloidal residue could be purified and freed from most of the known inert (ergotinine, ergotaminine) or "orally slow acting" alkaloid (ergotoxine and/or ergotamine (?), etc) in a number of ways because of the observation that the new alkaloidal substance, either in the form of the free base or its corresponding salts such as sulphate, phosphate, hydrochloride, tartrate, etc, was found to be far more soluble in all of the common organic solvents (methyl and ethyl alcohol, ether, chloroform acetone benzene, carbon bisulphide, carbon tetrachloride) than any of the four well known alkaloids Especially remarkable was the observation that the new alkaloid was somewhat soluble in water even as the free base, in marked contrast to ergotoxine or ergotamine Separation of the 'orally slow acting' ergotoxine or ergotamine type of alkaloid from the "orally quick acting" new alkaloid could therefore be accomplished either by (a) Dissolving the above total alkaloidal residue in anhydrous ether, converting the alkaloids to their corresponding sulphates causing a precipitation of most of the "orally slow acting" alkaloids which settle out in an over night period, leaving the 'orally quick acting' new alkaloid in solution, or (b) Dissolving the total alkaloidal residue in acetone, and cautiously adding water until precipitation of the ergotoxine or ergotamine type of alkaloid was complete, with subsequent removal by filtration, leaving the new alkaloid in solution

By either procedure the filtrate contained the new "orally quick-acting" alkaloidal substance, which was obtained in an amorphous condition upon removal of the solvent *in vacuo* In two trial lots, this amorphous alkaloid was purified further by redissolving the material in 0.5% aqueous tartaric acid and taking advantage of the observation that partial saturation with sodium bicarbonate causes precipitation of the new alkaloid from concentrated solutions The substance

was then collected upon a filter in the dark and promptly dried in a desiccator *in vacuo*. Working with 1 and 2 Kg quantities of ergot, the yield was 176 mg and 221 mg of alkaloid per Kg of original ergot, respectively, indicating that the percentage yield is increased when larger lots of the drug are used.

CHEMICAL NATURE OF THE NEW ALKALOIDAL SUBSTANCE

The new substance has not been obtained in a chemically pure completely crystalline condition. Quantitative data, therefore, will not be given at this time.¹ The approximately quantitative information which follows is presented solely because of the important bearing the results of this report have, *first*, upon the clinical observations of Moir pointing to a new important non-alkaloidal constituent in Ergot, and *second*, upon the suitability of currently used methods of assay and standardization for U S P, B P and other Pharmacopœial preparations of this drug.

The new alkaloidal substance contains all of the elements contained in ergotovine (10) ergotamine (11), ergotinine (12) and ergotaminine (11), namely, C, H, O and N. The proportions of these elements likewise have been found to roughly approximate those of the known alkaloids in a single analysis of the (impure?) material. The figures are withheld pending further analyses upon material of known purity but it may be stated that this analysis indicates that the molecule of the new alkaloid is definitely smaller than that of either ergotovine, ergotinine, ergotamine or ergotaminine.

It is insoluble in petroleum ether, but definitely more soluble in water, ethanol, ether, benzene, methanol, the chlor ethylenes and the chlor methanes, than the known alkaloids. It appears in representative but variable amounts in all freshly prepared liquid extracts such as Fluidextract of Ergot, U S P and Liquid Extract of Ergot, B P. It likewise appears in powdered and pilular extracts such as Ergotin[®] or Aqueous Extract of Ergot, N F V in extremely variable amounts, depending largely upon the amount of heat employed in the manufacturing

TABLE II —ALKALOIDS OF ERGOT

No	Alkaloid	Discoverer and Year Reported	Composition (Supposed)	Oxytoxic Activity Following Oral Administration	Van Urk (19) or Smith (3) Color Reaction	Cocklecomb and Isolated Rabbit Uterine (2) Reaction.
1	Ergotinine (12)	Tanret (1875)	$C_{28}H_{35}O_4N_3$ (Barger)	Negligible	Positive	Negligible
2	Ergotovine (10)	Barger and Carr (1907)	$C_{28}H_{35}O_5N_3$	Delayed but some what active on cat and human	Positive	Powerful
3	Ergotamine (11)	Stoll (1920)	$C_{28}H_{35}O_4N_3$	Delayed but some what active on cat and human	Positive	Powerful
4	Ergotaminine (11)	Stoll (1920)	$C_{28}H_{35}O_4N_3$	Negligible	Positive	Negligible
5	Pseudo ergotinine (13)	Smith and Timmis (1931)	$C_{28}H_{35}O_5N_3$ (assigned with reservation)	Unknown (probably inert)	Positive	Negligible (?)
6	Sensibamine (14)	Wolf (1931)	$C_{28}H_{35}O_4N_3$	Unknown	Positive	Powerful
7	Ergoclovain (15)	Küssner (1934)	$C_{28}H_{37}O_4N_3 \cdot H_2O$	Unknown	Positive	Powerful
8	X alkaloid	Thompson (1934)	C, H, O, N (mixture ??) formula not yet assigned	Promptly and highly active on cats and humans*	Positive	Powerful

* See appended note at end of article

¹ This amorphous "X alkaloid" has very recently yielded a crystalline product. Pharmacological and chemical studies upon these crystals are being pursued. Precise qualitative and quantitative data may, therefore, be presented in a later report.

process Boiling temperatures gradually destroy the alkaloid in aqueous medium, but the destruction is usually far from complete after many hours, especially if partial vacuum is coincidentally employed to affect concentration of the extract Concentration of extracts in metallic vessels, with heat *in vacuo* or otherwise, markedly accelerated the destruction of this active substance as well as the other alkaloids

The new alkaloid is much more stable than the ergotoxine type of alkaloid in crude extracts (either liquid or solid) Oxidation, spontaneous or chemically induced, causes the substance to become yellow, and finally a dark brown This oxidation is attended by a corresponding decline in oxytocic activity

Tested colorimetrically by the Smith method, or as modified by the 1932 B P, the blue color was readily obtained Of five different lots prepared to date, the intensity of the color reaction ranged from approximately 30% (for the less purified material) up to 60% (for the more purified material) of that produced by equivalent concentrations of ergotoxine ethanesulphate

It is of interest at this point to consider the possible identity of the new alkaloid, and its possible relationship to the four well-known alkaloids, as well as some alkaloidal substances which have been obtained and described by others since 1931 These alkaloids, exclusive of substances known to be degradation products of the alkaloids, with their discoverers, etc, may be tabulated as in Table II

It will be observed from Table II that all of the known alkaloids are closely related chemically They can be distinguished from one another, however, by differences in solubility, optical rotation, melting points (especially their crystalline salts which generally melt more sharply than either the crystalline or amorphous bases themselves), ease of crystallization, crystallizing medium, and character of crystals, but the very practically important and readily utilizable method of distinguishing between them is to be found in the promptness of their pharmacological and clinical activity following oral administration

Alkaloids Nos 1 and 4 may be at once dismissed as unimportant because they are practically inert even upon the isolated uterus No 5 probably falls in the same class, because of its extremely close relationship to the inactive ergotamine (13) They are pharmacologically inert thereby differing in the main essential from Nos 2, 3, 6, 7 and 8 Nos 2, 3, 6, 7 and 8 all appear to be pharmacologically active when tested upon the isolated rabbit uterus or other hitherto widely employed pharmacologic methods Nos 2 and 3, however, differ greatly from No 8 in that the oxytocic response following oral administration to pregnant cats is much more prompt and effective for No 8 than for Nos 2 and 3 As to Nos 6 and 7, nothing can be said from the standpoint of promptness or effectiveness when given orally since they were not available for this study nor has any such information been made available by others Regarding No 6, Barger (16) stated that Stoll had challenged the claim that this was a new alkaloid because upon mere recrystallization ergotamine was obtained (Note chemical similarity between 6 and 7) As to the relationship existing between Nos 7 and 8, it can only be stated that they are both highly active upon the isolated rabbit uterus, they appear to be similar as to solubility, both being water-soluble, but whether No 7 exhibits the prompt oral activity of No 8 is unknown None of No 7 was available for this study because of the fact that the report by Küssner (15) was obtained just prior to the sending of this report to press

PHARMACOLOGIC ACTION OF THE NEW ALKALOID

(a) *Upon the Cockscomb*—The U S P Cockscomb method measures this alkaloid along with the ergotoxine or ergotamine present in ergot preparations 0.2 to 0.4 mg per Kg consistently produced definite cyanosis of the combs

(b) *By the Epinephrine-Inhibition Isolated Rabbit Uterus Method* (2)—The purest of the five lots prepared to date acted in a manner qualitatively indistinguishable from ergotoxine or ergotamine Quantitatively the new substance appeared to be slightly more than half as potent as ergotoxine, in its possibly contaminated amorphous state

(c) *Upon Carotid Blood Pressure of Anesthetized Cats and Dogs*—Injected intravenously, a pressor action was demonstrated upon both cats and dogs, the effects upon the two species being similar An example of this activity is shown in Fig 10 The pressor effect was also similar to that of either ergotoxine or ergotamine by the intravenous route

The "vasomotor reversal" was readily produced in two cats as illustrated in Fig 10 a. Repeated dosage produced gradually diminishing pressor response until doses similar to the first effective dose would no longer produce an effect.

Oral doses up to 1 mg produced no significant change in carotid blood pressure of cats during one hour.

(d) *Upon the Isolated Uterus of the Guinea Pig*—These effects, using immature virgin uteri, were likewise indistinguishable from those of the "Total Alkaloidal Fraction," already described.

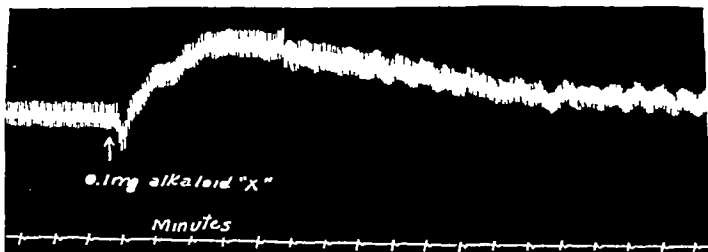


Fig 10—Male cat 29 Kg Dial urethane anesthesia carotid blood pressure. The pressor response following the intravenous administration of 0.1 mg of "X alkaloid."

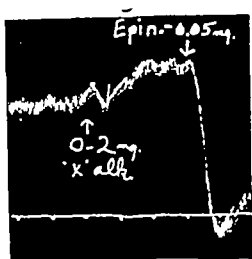


Fig 10 a—Male cat 31 Kg Dial urethane anesthesia, carotid blood pressure, illustrating the "vasomotor-reversal" induced by the "X alkaloid." Minutes

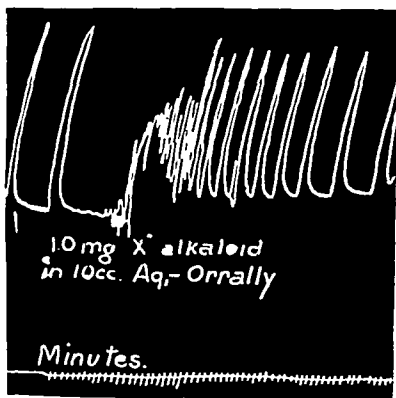


Fig 11—Cat late pregnancy uterus *in situ*. The prompt response following the oral administration of 1.0 mg "X alkaloid," with 10 cc of water.

Following the method previously described by the author (7), using mature uteri, histamine response was effectively inhibited in a manner similar to that produced by ergotamine or the "Total Alkaloidal Fraction."

(e) *Upon Normal Unanesthetized Pregnant Cats*—Either oral (1.0 mg) or subcutaneous (0.5 mg) doses were consistently effective in terminating pregnancy in a total of 21 cats in various stages of pregnancy. The young were invariably dead at birth. Death of two cats resulted after abortion following a subcutaneous dose of 1.0 mg to each, but this dose was not always fatal.

(f) *Upon the Uterus of the Lightly Anesthetized Pregnant Cat*—This was the only pharmacologic method which clearly revealed a difference between the new alkaloid and ergotamine.

Recording the movements of the uterus of the pregnant cat *in situ*, in the usual manner, oral doses of 1.0 to 2.0 mg of the new alkaloid in 10 to 20 cc of water have been observed to produce a uterine response usually well within five minutes, rarely beyond ten minutes, in 17 experiments.

Corresponding doses of ergotamine or ergotamine, as shown earlier in this report, are active in causing a response, but never in less than twenty minutes (usually thirty minutes or more). An example of the prompt response is illustrated in Fig 11. The activity is of long duration. Experiments have been observed up to four hours at which time evidence of activity had not ceased to be apparent.

SUMMARY AND CORRELATION OF RESULTS

The uterine activity of various "type" extracts of ergot and commercially available salts of ergotamine and ergotamine has been studied by observing the effects following oral, subcutaneous and intramuscular administration to anesthetized and unanesthetized cats in the later stages of pregnancy.

The method involving the recording of the uterine movements of the pregnant cat *in situ* provided a means of pharmacologically demonstrating an important difference between ergotamine or ergotamine, and crude aqueous or hydroalcoholic extracts of ergot, confirming Moir's clinical observations on this point. These studies have also confirmed Moir's conclusion that there exists in ergot a highly important new "as yet unidentified substance" in ergot.

Contrary to Moir's apparent belief, however, the present studies have shown that all of the activity obtained from his various ergot preparations, could have been obtained from no constituents of ergot other than one or more of the "total alkaloids". Even in the case of his "Aqueous Extracts," which are admittedly deficient in ergot alkaloids, the present studies have demonstrated that all of the significant activity shown by these preparations could have been due to no substances other than "residual alkaloid"¹.

¹ In a recent lecture (November 14, 1933) on ergot in London by Professor G. Barger (16) the lecturer discussed, among other things, the clinical observations of Moir pointing to a new important non alkaloidal principle in ergot. "The lecturer stated that this was also his own opinion up to about three months ago, when he thought that that was the situation. One U. S. worker, Marvin Thompson, who has published some accurate estimations of Ergot varieties had raised doubts in his mind as to whether the action was not, after all, due to some residual alkaloid. He would like to say very little on the subject, and he put forward the suggestion with some hesitation." The discussion provoked by Prof. Barger's lecture was also published by the same *Journal* (16). This discussion was very interesting to the present writer, inasmuch as the comments were made by a number of workers who have been most active in this field, including Dr. Moir, Sir Henry Dale and Professor Burn. It is quite obvious, from the comments made by these workers that they had little faith in the contention of "the American worker" that the activity observed by Moir from Aqueous Extracts was due to 'residual alkaloid'. Professor Burn stated that 'it was difficult to see how 'residual alkaloid' could produce an effect in a patient either quicker or as quickly as any other physiological effect'. Dr. Moir stated, in part, that 'The point was that an 'inactive' preparation proved to be active,' obviously implying that an alkaloid free preparation was clinically active. Sir Henry Dale stated, among other things that 'With regard to his (Professor Barger's) statements, referring to work in America which suggested that the action was due to residual alkaloid, he did not believe it. He thought that the amount of residual alkaloid was quite trivial'."

Replying to these comments, the present writer refers the reader to the evidence of this report including the appended note. It was this evidence which was discussed with Professor Barger during his visit in Baltimore, and which caused him to make mention of the matter in his lecture. In the studies reported by Moir, it is believed that the prompt and impressive activity he obtained from all of his extracts was due to ergot alkaloids. Although he assumed his aqueous extracts to be essentially alkaloid free, assays of numerous such extracts by the present writer have usually shown them to contain an alkaloidal content of 0.05 to 0.20 mg.

A chemical procedure for completely separating ergot into its "total alkaloidal" and "non-alkaloidal" fractions has been described. The colorless "Total Alkaloidal Fraction" has been found to contain all of the significant oxytocic activity of the drug, while all of the remaining constituents of ergot contained in the "Alkaloid-free" fraction were found to be completely devoid of any valuable oxytocic activity.

The "Total Alkaloidal Fraction" was observed to exhibit oxytocic activity in a manner superior to that of ergotoxine or ergotamine, proving that the "Total Alkaloidal Fraction" contained at least one hitherto unknown alkaloid.

A chemical procedure has been described for fractionating the "total alkaloids" by removing the ergotoxine, ergotamine, ergotinine and ergotaminine, leaving the new alkaloidal substance in solution. A method for the purification and isolation of the new substance in amorphous condition likewise has been presented. This substance, as it was obtained for these studies, was not proved to be a pure chemical entity, but was highly active.

The new alkaloid was found to differ pharmacologically from the hitherto known active alkaloids mainly in the promptness of its oxytocic action, especially following oral administration. The action of the new alkaloid usually developed in one to ten minutes, while the action of ergotoxine and ergotamine developed in twenty-five to sixty minutes, following oral administration of large doses to pregnant cats. Hitherto available methods (blood pressure, cockscomb, isolated tissues, etc.) failed to significantly distinguish qualitatively between ergotoxine or ergotamine and the new alkaloid. This is undoubtedly the reason for the hitherto well-established, although erroneous, opinion among pharmacologists that either ergotoxine or ergotamine were completely representative of the total activity of the drug or its extracts.

The results make it appear that the chief important differences between the new "X alkaloid" and the well-known ergotoxine or ergotamine are that the former is more soluble and more rapidly absorbable than either of the latter alkaloids. Little, if any difference is evident upon blood pressure following *intravenous* administration, or when compared upon *isolated* smooth muscle. It should be emphasized, however, that while the two types of alkaloid act similarly upon *blood pressure* following intravenous administration, the activity upon the *uterus in situ*, by the same route, is by no means similar. The activity of the new alkaloid is definitely more prompt and pronounced than that of ergotoxine or ergotamine, although the difference is not as great as when both types of alkaloid are given orally. It would appear, therefore, that the effect of either upon blood pressure is almost immediately dependent upon the concentration in the blood stream, but that the uterine effect is produced only after some further absorption or diffusion from the blood stream, perhaps into the lymphatic circulation, before exerting an effect upon the uterine innervation.

per cc in terms of either ergotoxine or ergotamine. Since Moir administered doses of such extracts ranging from 4.0 to 16.0 cc, it should be observed that the alkaloidal equivalent of such doses would range somewhere between 0.2 and 3.2 mg. The present writer has found that the greater part of the total alkaloids of aqueous extracts consists of the new alkaloid instead of ergotoxine or ergotamine, because of the greater ease of extraction and greater stability of the new alkaloid. Interpretation of Moir's results in the light of the results of this study, shows that the oxytocic effects he obtained from even his aqueous extracts were certainly due to "residual alkaloid," and this consisting principally of the new alkaloid here described.

It has been demonstrated that the active principles of ergot (total alkaloids) are not absorbed from the stomach of the cat, and that absorption occurs only after passage through the pylorus into the intestine. It is believed that this is probably likewise true in humans because of the fact that the time for onset of action from a given active preparation is not absolutely constant for different patients (see appended note, also Moir's results). Administration of the oral dose with 10 to 20 cc of water causes a much more consistently prompt response in cats, than when the same dose is given without water, presumably due to a more prompt opening of the pylorus stimulated by the larger bulk of fluid.

Aqueous and hydro-alcoholic extracts, when injected subcutaneously or intramuscularly, were observed to be intensely irritant. In the large doses, huge, slow-healing abscesses were produced. This is not an uncommon experience with clinicians. The severe irritation and abscesses have been shown to be caused, not by the valuable colorless (in solution) oxytocic constituents of ergot, but by the difficultly absorbable, deeply colored, inert fraction. The presence of these difficultly absorbable inert constituents in injectable ergot preparations should be condemned.

Hydro-alcoholic types of liquid extracts of ergot, when freshly and properly prepared, have been shown to contain all of the "total alkaloids" of the drug. They are, therefore, completely representative of the drug itself, as far as oxytocic activity is concerned. They are suitable for oral administration only, because they contain the irritant and difficultly absorbable inert constituents, and are, therefore, prone to cause pain and abscesses upon hypodermic injection.

Aqueous types of liquid extracts of ergot do not contain all of the "total alkaloids" of the drug. They have been found to contain practically all of the promptly acting new "X alkaloid," but only insignificant amounts of the slow acting ergotoxine or ergotamine type of alkaloid. Although the promptly acting "X alkaloid" is the more important because of its prompt action, the slow-acting ergotoxine or ergotamine type of alkaloid is, nevertheless, significantly active, undoubtedly adding considerably to the duration of effect. Such preparations, therefore, cannot be regarded as being completely representative of the drug. They are suitable for oral administration only, because they contain the irritant and difficultly absorbable inert constituents, and are, therefore, prone to cause pain and abscesses upon hypodermic injection.

The value of solid or pilular extracts (ergotins) for oral administration depends entirely upon the type of procedure used in their manufacture, particularly with respect to the amount of heat used. They can be prepared so as to be highly active, and if physiologically standardized, should be dependable. Most of such extracts available at the present time have had much of their alkaloidal activity destroyed by the excessive heat used in their manufacture (from the examination of 37 commercial samples, the manufacturing process of which was precisely known by the writer for 19 of the samples), and practically none of them is standardized. They owe the greater part of any activity they possess to the new "X alkaloid."

The currently available methods of assay and standardization have been studied with reference to their value in insuring activity in ergot preparations, and their relative merits discussed. The U S P Cockscomb method, the Broom-Clark Rabbit Uterus method, the Thompson Histamine-Inhibition Guinea-Pig

Uterus method, and the Smith colorimetric method, with the various modifications of each, have been shown to measure the new alkaloid along with the ergotoxine or ergotamine type of activity, but none of these methods can readily serve to distinguish between the prompt-acting new alkaloid and the slow-acting ergotoxine or ergotamine type alkaloid as these alkaloids exist in official extracts. Inasmuch as the new alkaloid is extracted easier, and appears to be much more stable than the ergotoxine or ergotamine type alkaloid (as these alkaloids exist in Pharmacopœial ergot preparations), it is believed that the use of any one of the above methods can be applied in such a manner as to insure satisfactorily standardized amounts of activity in such extracts. The method should, therefore, be chosen from the standpoint of routine reliability and precision. From this standpoint, the author favors a modification of the Broom-Clark Rabbit Uterus method (2), but has become favorably impressed with the merits and possibilities of the Colorimetric method. These methods will receive more specific consideration in a separate communication.

All of the above methods require the use of a "standard of comparison." The writer has examined all of the only four lots of U S P Standard Fluidextract ever prepared and distributed by the U S Department of Agriculture. Nos 635, 636 and 2160 have been shown to be unstable in an earlier report (17). The last lot prepared and distributed, No 2835, has been observed to lose not less than half of its original activity from the time it was first tested, in July 1932, until last tested in January 1934. This standard, therefore, fails in its purpose.

The author (18), in 1930, recommended that either ergotoxine ethanesulphonate¹ or ergotamine tartrate be adopted as the bioassay standard in place of the faulty "U S P Standard Fluidextract." These two salts have now been employed by the writer for over five years in testing ergot preparations. Both have been found to be satisfactory from the standpoint of stability. Since the newly discovered alkaloid shows a type of activity which is measured by all of the assay methods enumerated above, being practically indistinguishable from ergotoxine or ergotamine by such methods, and since a preparation of the new alkaloid of proven stability cannot be available for at least several years, it is believed that the adoption of one of the alkaloidal salts previously recommended is a virtual necessity. Until more appropriate methods of assay are available, a perfectly stable salt of the new alkaloid would have no advantage over available ergotoxine or ergotamine salts as a bioassay standard of comparison. In the light of evidence to date, including Moir's observations upon humans, the observations set forth in this report, and the studies by Koff upon humans (see appended note), the relationship existing between quantitative bioassay results (U S P or other methods measuring "total alkaloidal activity") may be illustrated by taking a properly prepared representative U S P Fluidextract of Ergot as containing all of the therapeutically active principles of the drug. Arbitrarily assigning the value of 100% to both the clinical activity and the bioassay (cockscorn, etc.) activity, the new "X alkaloid" is present in such proportions as to account for 15 to 25% of the bioassay activity, but owing

¹ The ergotoxine ethanesulphonate used in these studies was very kindly supplied by Dr Clifford S Leonard, Burroughs Wellcome & Co. For the generosity in supplying the ergotamine tartrate and methanesulphonate here employed, the author is indebted to The Sandoz Chemical Works.

to the great clinical effectiveness of this alkaloid, it accounts for approximately 75% of the clinical activity. The slow and feebly acting (clinically) ergotoxine or ergotamine type of alkaloid in such a fluidextract accounts for 75 to 85% of the bioassay activity, but only 15 to 25% (approx.) of the clinical activity. The "X alkaloid" is extracted much more easily and is more stable than the ergotoxine type of alkaloid. Therefore, a fluidextract may assay as low as 15 to 20% of U S P requirements and still retain the greater part of its clinical oxytocic activity.

CONCLUSIONS

1 The pregnant cat has been found to be a suitable test subject upon which to study comparatively the oxytocic activity of various types of preparations and constituents of ergot.

2 A procedure, involving oral administration of the ergot preparations, has been described and used extensively for the above purpose. Such a procedure can be successfully employed in investigating the chemical source of the significant oxytocic activity of ergot.

3 Carefully prepared hydro-alcoholic extracts of ergot, such as Fluidextract of Ergot, U S P (U S P X or Interim Revision), or Liquid Extract of Ergot, 1932 B P, contain all of the important active principles of the drug. Such preparations are rich in alkaloids and are remarkably prompt and effective upon the uterus following oral administration.

4 Aqueous extracts of ergot do not contain all of the important active principles of the drug. They are deficient in ergot alkaloids, but are never alkaloid-free unless they are many years old or the alkaloids have been destroyed by excessive heat in their manufacture. When carefully prepared, these extracts are remarkably prompt and effective upon the uterus following oral administration. This prompt and effective activity is entirely out of proportion to the ergotoxine or ergotamine equivalents of such preparations.

5 Ergotoxine and ergotamine are indistinguishable in producing a much delayed and erratic action following oral administration. The activity of these alkaloids is, therefore, far from being completely representative of the drug itself or its crude extracts, as formerly supposed.

6 A hitherto unknown, highly important, active principle exists in ergot.

7 Every trace of the significant oxytocic activity has been found to reside in the chemically purified "total alkaloids" of the drug, even in the so-called aqueous extracts, as shown by the prompt activity obtained from the "Total Alkaloidal Fraction" in contrast to the complete lack of significant activity in the "Alkaloid-Free Fraction."

8 Ergotoxine and ergotamine are not representative of the "total alkaloidal activity." The new active principle appears, therefore, to be another member of the specific alkaloids of ergot, since it followed the other alkaloids in the chemical procedure used in obtaining the "Total Alkaloidal Fraction."

9 The activity of aqueous extracts observed by Moir must have been due, contrary to his belief, to "residual alkaloid" consisting mainly of the new alkaloid described in this report. The alkaloidal deficiency of such extracts is due to the inefficiency of water in extracting the ergotoxine or ergotamine. Most of the more

stable new alkaloid is readily extracted by water and hence appears in fairly representative amounts in such extracts

10 The new alkaloid has been isolated in a sufficiently pure amorphous condition to permit of certain pharmacological and chemical comparisons with the hitherto known alkaloids

11 The new alkaloid is closely related to ergotoxine and ergotamine as is shown by similar chemical behavior and also as is shown by its similar pharmacological action when tested upon the isolated guinea-pig uterus, the isolated rabbit uterus, the cockscomb and the carotid blood pressure of cats or dogs Its activity persists for hours, as does that of ergotoxine and ergotamine

12 The new alkaloid differs from ergotamine and ergotoxine mainly by its much more soluble nature, and by its more prompt and powerful oxytocic action following oral administration The greater solubility, together with the probability that the new alkaloid has a smaller molecule, compared with ergotoxine or ergotamine, undoubtedly accounts for the more prompt absorption and greater effectiveness of the new alkaloid

13 All of the remarkable observations of Moir can be explained by the demonstration of the existence of the new alkaloid

14 None of the active oxytocic principles of ergot (the specific alkaloids) are absorbed to any significant extent from the stomach of the cat, following oral administration

15 All of the active oxytocic principles of ergot (the specific alkaloids) are absorbed with varying degrees of rapidity from the intestine of the cat following oral administration The new alkaloid is promptly absorbed while ergotoxine and ergotamine are absorbed with great difficulty This difference in absorption rate also manifests itself following subcutaneous or intramuscular injection

16 Ordinary aqueous or hydro-alcoholic extracts of ergot are intensely irritant to the tissues following subcutaneous or intramuscular administration Severe abscesses develop at the site of injection, especially following the larger doses

17 The irritant and abscess-forming properties are not due to the important active principles (the specific alkaloids) of ergot They are due to the otherwise pharmacologically inert extractives appearing in the liquid extracts

18 The color of an ergot preparation is no indication of its value or activity The purified, total active principles are colorless in solution

19 Either ergotoxine ethanesulphonate or ergotamine tartrate constitutes the best available "standard" for comparison in the evaluation of ergot preparations by the currently accepted quantitative methods

20 The Isolated Guinea-Pig Uterus method, as usually applied (as in testing Liquor Pituitarii, U S P), is wholly unreliable as a means of insuring significant activity in ordinary aqueous or hydro-alcoholic extracts It measures chiefly the worthless non-specific amine activity of such extracts

21 Clinical activity in reasonably standardized amounts can be insured by requiring official liquid ergot extracts to contain a total specific alkaloidal activity, equivalent to approximately 0.05 per cent, in terms of either ergotoxine ethanesulphonate or ergotamine tartrate, when tested by the Cockscomb method, the Epinephrine-Inhibition Rabbit Uterus method or the Colorimetric method This will provide for the presence of essentially all of the more important new alkaloid

present in the parent drug, plus varying but larger proportions of the less important ergotoxine or ergotamine. None of these methods can serve to differentiate between the new alkaloid, ergotoxine or ergotamine in crude extracts.

22 Solid or pilular extracts can be made to contain a satisfactory amount of activity by extracting properly and avoiding the use of excessive heat and exposure to oxygen in the process of concentration.

23 The non-specific amino-bases of ergot (histamine, tyramine, choline, etc.) contribute nothing of a desirable nature to the characteristic oxytocic activity of the drug.

NOTE ADDED MAY 1, 1934

Through the kindness of Dr. Arthur K. Koff, Woman's Clinic, The Johns Hopkins Hospital, some clinical confirmation of the pharmacological and chemical evidence of this report has been obtained. During the past two years, Dr. Koff has conducted over fifty experiments upon human patients, recording the oxytocic action of drugs in a manner essentially similar to that employed by Dr. Moir in England. After observing the clinical response of different ergot preparations, he has, among other things, confirmed Dr. Moir's observations that both the aqueous and alcoholic types of crude extracts, given orally, cause a remarkably prompt and intense uterine response, entirely out of proportion to their ergotoxine or ergotamine equivalent, and that oral doses of salts of ergotoxine and ergotamine produce only a much delayed and feeble response even in very large doses.

Upon being informed of the pharmacological and chemical results obtained by the author, Dr. Koff very kindly agreed to observe the activity of certain preparations upon human patients recording the uterine contractions directly as in Moir's experiments. The author's "Alkaloid Free Fraction," freshly prepared as described in the above report except that 1 cc. represented 2 Gm. instead of 1 Gm. of ergot administered orally to three patients, proved to be completely inert in doses up to 10 cc., representing 20 Gm. of the original ergot. The original fluidextract, from which the "Alkaloid Free Fraction" was prepared, produced the characteristic prompt and pronounced effects of the crude extracts upon these same patients, in 4-cc. doses (representing 4 Gm. ergot), the effect developing within fifteen minutes in every case.

An oral dose of 40 cc. of "Total Alkaloidal Fraction," prepared as described in the above report, and representing 40 Gm. of the original ergot, administered to one patient, produced a pronounced effect well within fifteen minutes. The promptness of action was indistinguishable from that produced by the fluidextract from which both "fractions" were prepared. The effect was still pronounced after nine hours, observations being discontinued at this point.

The orally "slow acting" ergotoxine or ergotamine type of alkaloid, separated in the usual described manner from the "Total Alkaloidal Fraction," proved to be devoid of the prompt type of activity following an oral dose of the alkaloid equivalent to 8 Gm. of the original ergot to one patient. No effect whatever was evident for more than an hour, after which a feeble effect entirely similar to that produced by available salts of ergotoxine and ergotamine, was produced.

These clinical experiments are especially significant because of the fact that the difference between the delayed and erratic ergotoxine or ergotamine effect and the prompt action of crude extracts is so great and so consistent that it is quite unnecessary to carry out numerous experiments in order to show the difference. It will be noted that these experiments upon humans have confirmed the results obtained upon the pregnant cat in every case. The "Alkaloid Free Fraction" was capable of producing no oxytocic effect upon cat or human. The "Total Alkaloidal Fraction" produced a prompt and intense oxytocic effect upon both cat and human. The ergotamine or ergotoxine type of alkaloid removed from the "Total Alkaloidal Fraction" produced a much delayed feeble effect upon the human and the cat (huge doses to cats produce an intense effect, but it is always much slower in developing than in the case of the crude extracts or the "Total Alkaloidal Fraction"), entirely similar to that produced by commercially available salts of ergotoxine and ergotamine.

The details of these clinical experiments will be more completely described elsewhere by Dr. Koff.

The author wishes to acknowledge indebtedness to Professor E V McCollum, School of Hygiene and Public Health, The Johns Hopkins University, for his inspirational guidance, and to express sincere appreciation for his constant encouragement during this investigation

He also wishes to express gratitude to Professors J J Abel, E K Marshall and E M K Ceiling, Department of Pharmacology of the Medical School, The Johns Hopkins University, and Professor G Barger, University of Edinburgh, for helpful criticism and valuable suggestions, and to Dr Arthur K Koff of the Woman's Clinic, The Johns Hopkins Hospital, for extending invaluable clinical cooperation

Full responsibility is assumed by the writer, however, for any errors in presentation, results or conclusions which may appear in this report

REFERENCES

- (1) Thompson, *JOUR A PH A* 22 736 (1933)
- (2) Thompson, *Ibid* 21 1135 (1932)
- (3) Smith *U S Pub Health Rep*, 45 1466 (1930)
- (4) Moir *Brit Med J*, June 4th, 1022 (1932)
- (5) Moir *Ibid*, June 18th, 1119 (1932)
- (6) Thompson, *JOUR A PH A* 19 705 (1930)
- (7) Thompson, *Ibid*, 18, 1106 (1929)
- (8) Thompson, *Ibid* 19 11 (1930)
- (9) Thompson, *Ibid*, 19 221 (1930)
- (10) Barger and Carr *Chem News* 94, 89 (1906)
- (11) Stoll *Schweiz Apoth Z*, 60, No 26 (1922)
- (12) Tanret *Compt rend* 81 896 (1875)
- (13) Smith and Timmis *J Chem Soc*, 1888 (1931)
- (14) Chinoim, A G and Wolf, *Brit Pat* No 388 529 (1931)
- (15) Kussner *Arch Pharm Ber Dent pharm Ges* 3 503 (1934)
- (16) Barger *Pharm J* Nov 18, 597 (1933)
- (17) Thompson *JOUR A PH A*, 20 1027 (1931)
- (18) McClosky Thompson and Barbella *Ibid*, 19, 844 (1930)
- (19) Van Urk, *Pharm Weekblad*, 66 473 (1929)

SOME PHARMACOLOGICAL AND BACTERICIDAL PROPERTIES OF UMBELLULONE ^{1 2}

BY MILES E DRAKE³ AND ERNST T STUHR

INTRODUCTION

The literature on the oil of the California laurel, *Umbellularia californica* (Hook and Arn) Nutt, includes very little information on the pharmacology of the oil, or of the ketone (umbellulone) obtained from it. Likewise, no reference was

* Scientific Section, A PH A, Washington meeting, 1934

¹ An abstract based upon a thesis by Miles E Drake submitted to the faculty of the Graduate School of the Oregon State College in partial fulfillment of the requirements for the degree of Master of Science in Pharmacy

² Department of Pharmacology and Pharmacognosy, School of Pharmacy, Oregon State College

³ Fairchild Scholar, 1933

found in the literature on volatile or essential oils in regard to the germicidal or fungicidal activity of this oil and ketone. Extensive research has been pursued on the chemistry of the constituents in this oil by various investigators.

Persons who have come in close proximity with the myrtle oil or its vapors report discomforts, such as severe headaches, irritation of the skin and mucous membrane, and in several instances unconsciousness resulted. The apparent potency of the oil prompted this investigation.

HISTORICAL

Umbellularia californica (Hook. and Arn.) Nutt. was first collected in California by Menzies (1) in the latter part of the eighteenth century. Prior to Menzies, the Spaniards of California knew the tree as *Laurel Silvestre*.

In 1826 Douglass (2) classified this evergreen tree as a laurel, *Laurus regia* (the regal laurel) probably intending to indicate the beauty and splendor of the tree.

In 1833 Hooker and Arnott (3) classified this evergreen as *Tetranthra californica*. Later Nuttall (3) gave it the present name of *Umbellularia californica*. As far as has been reported this is the only representative of the genus *Umbellularia*.

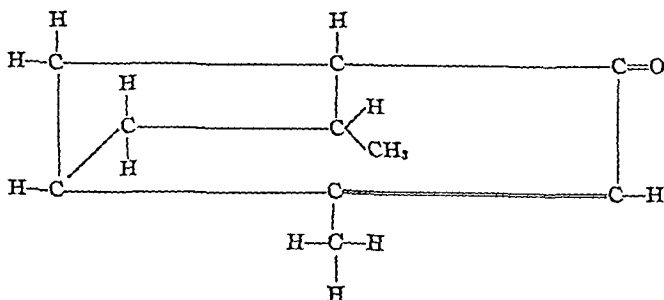
Heaney (4) in 1875 by fractionation under reduced pressure obtained from the oil of the California laurel a colorless liquid (Oreodaphenol) possessing a pungent odor.

Stillman (5) in 1880 by fractionation at 215–216° C. obtained a colorless mobile liquid possessing an aromatic but pungent odor. Excessive inhalations of the vapors of this fraction were observed to produce headaches.

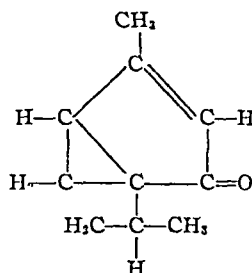
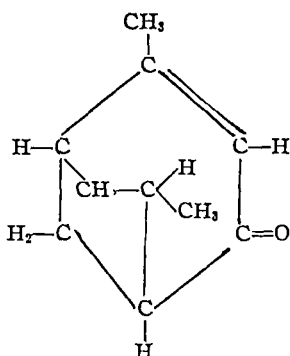
Powers and Lee (6) in 1904 reported the following principles or constituents which the oil yielded on fractionation: pinene, cineol, eugenol, methyl eugenol and a ketone, umbellulone, which was collected at 217–222° C. The purified ketone had a sp. gr. of 0.9584 at 15/15, $[\alpha]_D^{20} - 37^\circ$ in a 100 mm. tube. Powers and Lee (6) concluded that umbellulone had one ethylenic linkage, and gave it the following structural formula:



Fig 1 —Myrtle Tree (*Umbellularia californica*)



Tutin (7) in 1908 gave umbellulone the following structural formula:



Semmler (8) in 1908 gave umbellulone the structural formula which is accepted to day. According to Spiegel (9) sabinol, thujone and umbellulone are very similar in structure.

DISTILLATION AND DESCRIPTION OF THE OIL OF MYRTLE

The leaves after drying are steam distilled. The oil is collected in an excess of water distillate which on standing separates into two layers, the oil layer being on top of the water layer. The layer of oil is decanted and dried over anhydrous sodium sulphate. The yield of the oil, according to Parry (10) varies from 2.5 to 5.5 per cent.

The oil of *Umbellularia californica* is a clear brownish yellow liquid. It possesses a sweet but pungent, irritating, empyreumatic, persistent odor. Parry (10) gives this oil a sp. gr. of 0.935 to 0.950, and an optical rotation of -22° . Sawyer (11) states that the dry oil has a sp. gr. of 0.936 and a solubility of 1/1000 in water.

THE KETONE FROM THE OIL OF MYRTLE

Wienhaus and Todenhofer (12) in 1929 prepared the ketone, umbellulone, from the oil of myrtle by preparing a water-soluble sulphite addition product from the oil. This addition product was steam distilled and purified by fractionation under reduced pressure. Following the method of Wienhaus and Todenhofer no appreciable ketone yield was obtained, therefore, the following modified method was employed.

Method No. 1 Modified Wienhaus and Todenhofer—Three hundred and fifty grams of myrtle oil were shaken out twice with a saturated solution composed of 400 Gm. of sodium sulphite and 80 Gm. of sodium bicarbonate in 400 cc. of distilled water. This solution when neutral to five drops of phenolphthalein was shaken vigorously for 30 minutes. The resulting mixture was allowed to separate and the oil layer was decanted. This oil was then treated with a second 400 cc. of the saturated sodium sulphite-bicarbonate solution and permitted to stand 24 hours. The oil was again decanted and the aqueous portions of the first and second washings were combined and steam distilled in a neutral condition for two hours in order to free the aqueous solution of any excess oil. The oil-free aqueous residue was treated with 40 Gm. of stick sodium hydroxide and the mixture was steam distilled for three hours. The resulting product was fractionated under 4-mm. reduced pressure, yielding purified umbellulone at $77.5-77.8^\circ \text{C}$ (uncorrected). Yield 48 Gm.

Physical Constants of the Ketone (Umbellulone)— $[\alpha]_D^{25} -38.50$, $n_D^{25} 1.48285$, $d_4^{25} 0.9465$, agreeing fairly well with the reports of Wienhaus and Todenhofer (12).

The following tabulation gives the constants reported by various investigators.

TABLE I

	Sp. Gr.	Op. Act.	R. I.	B. P. 4 Mm.
Wienhaus and Todenhofer (12)	0.949 (20°)	-38.51	1.48315 (20°)	85°
Stillman (5)		-36.30		
Powers and Lee (6)	0.9614 (15.5°)	-36.33	1.48325 (20°)	
Authors	0.9465 (25°)	-38.50	1.48285 (20°)	77.5-77.8°

Method No 2 Fractionation—Three hundred grams of myrtle oil were fractionated at 4 mm reduced pressure. A total of nine fractions was collected. Fraction IV (74–78° C) and Fraction V (78–80° C) were refractionated. Fraction No 2 (77.1–77.6° C) of IV, and fraction No 1 (77.2–77.7° C) of V were combined and refractionated, yielding 61 Gm of the ketone, umbellulone at 77.1–77.7° C. Only two physical constants were taken of this fraction. The B P by the capillary method (13) was found to be 216–217° C (corrected). The refractive index was found to be 1.4830 at 21° C. Yield. The following percentages of ketone yield were obtained

Modified Wienhaus and Todenhofer method	13.71%
Fractionation method	20.3%

as compared to yields reported by previous investigators

Wienhaus and Todenhofer (12)	24.5%
Powers and Lee (6)	60.0%
Stillman (5)	40.0%
Russell (14)	28.0%

SOLUBILITY OF UMBELLULONE

Freely soluble in 70 per cent alcohol	Freely soluble in liquid petrolatum
Freely soluble in olive oil	Freely soluble in Miller solvent (19)

PRELIMINARY INVESTIGATION

Effects on Blood *in Vitro*—To determine the action of umbellulone on defibrinated blood *in vitro* the method of Dessemontit (15) was used. To one cc of blood was added three cc of 0.9% sodium chloride and 0.06 cc of umbellulone. This mixture was warmed gently, placed in a Sedgwick counter and observed through a spectrometer. Horse blood and guinea-pig blood were used.

Results

Diluted horse blood—no bands were present within range of methemoglobin

Diluted horse blood plus 10% solution of potassium ferricyanide—upon heating gently the blood became a chocolate brown and the following bands were noted

First Trial		Second Trial	
First band	635–631 μ μ	First band	636–632 μ μ
Second band	588–572 μ μ	Second band	587–572 μ μ
Third band	554–532 μ μ	Third band	544–532 μ μ

Diluted horse blood plus 0.06 cc of umbellulone—upon heating the blood became a chocolate brown and the following bands were noted

First Trial		Second Trial	
First band	635–631 μ μ	First band	634–631 μ μ
Second band	587–571 μ μ	Second band	589–573 μ μ
Third band	555–536 μ μ	Third band	554–532 μ μ

Diluted guinea pig blood plus 0.06 cc of umbellulone—the following bands were noted

	First Trial	Second Trial	Third Trial
First band	634–630 μ μ	634–631 μ μ	635–630 μ μ
Second band	586–572 μ μ	588–571 μ μ	589–572 μ μ
Third band	553–533 μ μ	553–534 μ μ	553–534 μ μ

The bands obtained on both horse blood and guinea-pig blood are in fair agreement with those reported by Halliburton (16). The center of the absorption band considered as characteristic had a wave-length of 630–634 μ μ , according to Dessemontit (15).

Effects on Blood in Vivo—A guinea pig received two cc of 1 1000 umbellulone in olive oil intraperitoneally three times a week for six weeks. At the end of six weeks the blood was obtained by the heart stab method and kept at 37.5° C until used. To one cc of this blood was added three cc of 0.9 per cent sodium chloride solution. The results were as follows:

First band	634-630 $\mu\mu$
Second band	587-573 $\mu\mu$
Third band	554-532 $\mu\mu$

Figure 2 shows the absorption band at 630-634 $\mu\mu$. The guide lines above are the neon lines (Page 203).

Further work showed that umbellulone produced decided hemolysis of human, guinea pig and horse blood.

Effects of Umbellulone upon the Intact Heart of the Frog—The frogs were prepared for heart recording (17) and 0.2 cc of 10 per cent umbellulone in 1 per cent acacia emulsion dropped upon the heart after a normal tracing had been obtained. Results:

Umbellulone at first produced a quickening in the heart rate which was followed by a progressive decrease in frequency, loss in tonus and a decrease in contraction of the ventricle. The heart finally stopped in diastole. It was found that the addition of 0.1 cc of 1 1000 caffeine to the washed heart produced no reviving effect. The injection of 0.2 cc of 1 1000 adrenaline hydrochloride into the right atrium also produced no reviving effect upon the paralyzed heart.

Effects of Umbellulone on the Atropinized Frog Heart—The hearts of other frogs were first treated with 0.2 cc of 1% atropine and the atropine allowed to take effect. About five minutes after the application of the atropine the excess was washed off with 0.65 per cent sodium chloride solution and 0.2 cc of 10 per cent umbellulone dropped upon the heart. There was at first a quickening of the heart rate, which was followed by a progressive decrease in frequency, loss in tonus and a decrease in contraction of the ventricle. The heart stopped in diastole.

Effects of Physostigmine on Umbellulonized Frog Heart—The hearts of frogs were treated with a 10 per cent solution of umbellulone. There was an initial increase of rate or frequency, followed by a progressive decrease in frequency, ending in apparent paralysis of heart. Several drops of 1 100 physostigmine solution were applied to the paralyzed heart, resulting in partial revival.

Effects of Umbellulone on Unanesthetized Animals—Injection

Two guinea pigs were used, each receiving an intraperitoneal injection of four cc of a 10 per cent solution of umbellulone in olive oil. Two minutes after the injection the guinea pigs showed a slight paralysis of the hind quarters. This was followed by a drop in pulse rate with a slight change in respiration which rapidly became very irregular. Both pigs showed asphyxia convulsions which became more frequent and pronounced toward the end of the experiment. Following the decrease in pulse rate there was a marked increase in the pulse which was followed by failure in respiration. The heart stopped in about a minute after respiration failure.

Post-mortem examination indicated the odor of umbellulone pronounced in both peritoneal and pericardial cavities. The heart stopped in diastole. The

heart, aorta and the superior and inferior vena cava were dilated. The lungs showed decided congestion and the blood was of a dark color.

Inhalation

Warmed umbellulone was placed in a desiccator and allowed to vaporize in the presence of a guinea pig for a period of four hours. At intervals the enclosed chamber was oxygenated. The only apparent result was irritation of the mucous membranes of the eyes and nose. The respiration was at times irregular but at no time did it show signs of failure.

EXPERIMENTAL WORK I BACTERICIDAL ASPECTS

FUNGICIDAL ACTION OF THE OIL AND THE UMBELLULONE

Method

The organisms used were *Monilia tropicalis* (1885) and *Trychophyton interdigitale* (2284).

The Food and Drug Administration method (18) was used with a standard loop for transferring to a broth of pH 5.0 for a period of five days.

The solvent (19) employed to dissolve the ketone, umbellulone, was a sterilized mixture composed of 33 parts, respectively, of 95 per cent alcohol, glycerol, distilled water and 66 parts of powdered castile soap. This solvent was tested for fungicidal action and was found to check with the reports of Miller (19).

The fungicidal action of umbellulone was determined by a modification of the method by Kingery and Adkison (20). Two cc. of the ketone solution was placed in one cc. of 24 hour broth culture and allowed to stand for the specified intervals of time (one, thirty and sixty minutes), and then transfers were made to Sabouraud's Agar medium and incubated for 48 hours and read.

Ten experiments were undertaken. Table II is a tabulation of the typical results obtained.

TABLE II

No.	Dilution	Oil of Myrtle, Time in Minutes			Umbellulone Time in Minutes		
		1	30	60	1	30	60
1885	1/10	—	—	—	++++	—	—
	1/50	++	—	—	++++	—	—
	1/100	++++	++	+	++++	+	—
	1/1000	++++	++++	++	++++	+	+
2284	1/10	—	—	—	++++	—	—
	1/50	+	—	—	++++	—	—
	1/100	+++	++	+	++++	+	—
	1/1000	++++	++++	++	++++	++	++

Legend to table

—	No growth recorded
+	1-4 colonies observed on the quarter
++	5-10 colonies observed on the quarter
+++	11-24 colonies observed on the quarter
++++	25 or more colonies observed on the quarter

The oil and the ketone in the absence of protein killed the specific organisms used in dilutions of 1/10 for intervals of 1, 30 and 60 minutes, but in a 1/50 dilution growth was recorded with one-minute contact for the oil of myrtle, but not for the umbellulone. In the 1/100 dilution there was recorded growth in all intervals of time for the oil of myrtle, while the ketone showed no growth on 60 minutes' contact. In 1/1000 dilution all contacts were positive.

The fact that the organisms were killed and not inhibited was demonstrated by taking a loop of each dilution for the various intervals of time, and transferring to a sterile tube of broth. No growth was recorded in 48 hours at 37° C

FUNGICIDAL ACTION OF UMBELLULONE IN THE PRESENCE OF PROTEIN

Fifteen experiments were undertaken

Method

Organisms (1885 and 2284) and the F D A method (18) of transferring were used with the same technique as before, using media containing gelatin, peptone and 10 per cent defibrinated horse blood in Sabouraud's medium. The p_H for the respective media was adjusted to 5.5 and sterilized at 15 lbs pressure for 18 minutes.

Results

Blood Medium —In the presence of 10 per cent blood medium, organism (1885) was killed for all contacts of time intervals by 1/10 dilution. 1/100 dilution was negative in 60-minute contact, 1/1000 dilution was positive in all contacts. The same results were recorded for organism (2284).

Gelatin and Peptone Media —Organism (1885). All contacts were negative in 1/10 dilution, 1/100 dilution, 1-minute contact was positive, 30- and 60 minute contacts were negative, 1/1000 dilution, all the contacts of time intervals were positive.

Organism (2284). 1/1000 dilution on gelatin medium recorded positive in 1- and 30-minute contacts, while the 60-minute contact was negative. All other recordings were identical with those of organism (1885).

Umbellulone in the presence of protein-like materials was found to be only slightly inactivated.

NOTE. The dilutions as specified in all these experiments are as before adding to the 24-hour broth culture, in each case the original dilution was diluted one half.

GERMICIDAL ACTION OF UMBELLULONE

Method

A. *Wet Filter-paper method* of the F D A (18) was employed. Organisms used were *E. typhi* (Sears) and a standard stock culture of *Staphylococcus albus*. Neither organism was inhibited or killed by 5-minute exposures to 1/70 dilution of phenol. Both organisms were killed by a 15-minute exposure in a 1/90 dilution of phenol.

Results

The accompanying Table III is typical of the results obtained

TABLE III

Organism	Time	Dilutions					
		1/10	1/20	1/100	1/500	1/1000	1/2000
<i>E. typhi</i>	1	—	—	—	+	+	+
	2	—	—	—	+	+	+
	5	—	—	—	—	+	+
	7½	—	—	—	—	+	+
	15	—	—	—	—	—	+
	30	—	—	—	—	—	+
	60	—	—	—	—	—	+

<i>Staph albus</i>	1	—	—	—	+	+	+
	2	—	—	—	+	+	+
	5	—	—	—	+	+	+
	7 ¹ / ₂	—	—	—	+	+	+
	15	—	—	—	—	+	+
	30	—	—	—	—	—	+
	60	—	—	—	—	—	+

1 Stimulated phenol coefficient, 6.25

B The F D A Agar-Plate Method (18)—*E typhi* (Sears) and *Staph albus* were the organisms used. The ointments were composed of Umbellulone 10 per cent, 5 per cent, 1 per cent and 1/10 of one per cent, with lanolin as a base.

Results

All dilutions showed inhibitory and diffusibility action. The fact that *E typhi* and *Staph albus* were killed was determined by using a portion of the material from the clear zone of the plate and transferring to sterile tubes of broth which were incubated for 24 hours at 37° C.

II EFFECTS OF UMBELLULONE ON ISOLATED INTESTINAL SEGMENT

The following experiments were carried out by using a modification of the procedure of Salant and Mitchell (21).



Fig 2—Spectrogram of the umbellulone on guinea pig blood



Fig 3—Rabbit gut. Effect of 1 cc of 1/100 solution of umbellulone giving a dilution of 1-40,000. (A) Normal, (B) Partial paralysis, (C) Normal segment. Base line indicates two minute intervals.

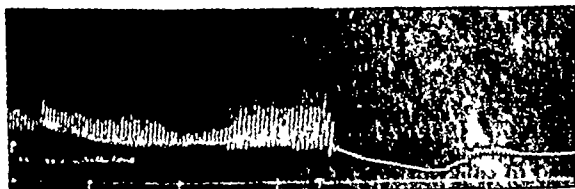


Fig 4—Rabbit gut. Showing progressive loss of contraction (in dilution of 1-13,333 of umbellulone) with period of slight stimulation and complete paralysis of intestinal segment. Time—two minute intervals.



Fig 5—Rabbit gut. Intestinal segment revived in Locke's solution. Time—two minute intervals.

Method

The rabbits and cats were killed by administering an excessive dose of chloroform. The small intestines were immediately removed, care being taken to avoid injury to the intestines. The removed intestines were placed in fresh, oxygenated Locke's solution and kept at 37.5° C.

The fact that the organisms were killed and not inhibited was demonstrated by taking a loop of each dilution for the various intervals of time, and transferring to a sterile tube of broth. No growth was recorded in 48 hours at 37° C.

FUNGICIDAL ACTION OF UMBELLULONE IN THE PRESENCE OF PROTEIN

Fifteen experiments were undertaken

Method

Organisms (1885 and 2284) and the F D A method (18) of transferring were used with the same technique as before, using media containing gelatin, peptone and 10 per cent defibrinated horse blood in Sabouraud's medium. The p_H for the respective media was adjusted to 5.5 and sterilized at 15 lbs. pressure for 18 minutes.

Results

Blood Medium—In the presence of 10 per cent blood medium, organism (1885) was killed for all contacts of time intervals by 1:10 dilution. 1:100 dilution was negative in 60-minute contact, 1:1000 dilution was positive in all contacts. The same results were recorded for organism (2284).

Gelatin and Peptone Media—Organism (1885). All contacts were negative in 1:10 dilution, 1:100 dilution, 1-minute contact was positive, 30- and 60-minute contacts were negative, 1:1000 dilution, all the contacts of time intervals were positive.

Organism (2284). 1:1000 dilution on gelatin medium recorded positive in 1- and 30-minute contacts, while the 60-minute contact was negative. All other recordings were identical with those of organism (1885).

Umbellulone in the presence of protein-like materials was found to be only slightly inactivated.

NOTE. The dilutions as specified in all these experiments are as before adding to the 24 hour broth culture, in each case the original dilution was diluted one half.

GERMICIDAL ACTION OF UMBELLULONE

Method

A *Wet Filter-paper method* of the F D A (18) was employed. Organisms used were *E. typhi* (Sears) and a standard stock culture of *Staphylococcus albus*. Neither organism was inhibited or killed by 5-minute exposures to 1:70 dilution of phenol. Both organisms were killed by a 15-minute exposure in a 1:90 dilution of phenol.

Results

The accompanying Table III is typical of the results obtained.

TABLE III

Organism	Time	Dilutions					
		1:10	1:20	1:100	1:500	1:1000	1:2000
<i>E. typhi</i>	1	—	—	—	+	+	+
	2	—	—	—	+	+	+
	5	—	—	—	—	+	+
	7½	—	—	—	—	+	+
	15	—	—	—	—	—	+
	30	—	—	—	—	—	+
	60	—	—	—	—	—	+

<i>Staph albus</i>	1	—	—	—	+	+	+
	2	—	—	—	+	+	+
	5	—	—	—	+	+	+
	7 1/2	—	—	—	+	+	+
	15	—	—	—	—	+	+
	30	—	—	—	—	—	+
	60	—	—	—	—	—	+

Estimated phenol coefficient, 6.25

B The F D A Agar-Plate Method (18)—*E typhi* (Sears) and *Staph albus* were the organisms used. The ointments were composed of Umbellulone 10 per cent, 5 per cent, 1 per cent and 1/10 of one per cent, with lanolin as a base.

Results

All dilutions showed inhibitory and diffusibility action. The fact that *E typhi* and *Staph albus* were killed was determined by using a portion of the material from the clear zone of the plate and transferring to sterile tubes of broth which were incubated for 24 hours at 37° C.

II EFFECTS OF UMBELLULONE ON ISOLATED INTESTINAL SEGMENT

The following experiments were carried out by using a modification of the procedure of Salant and Mitchell (21).

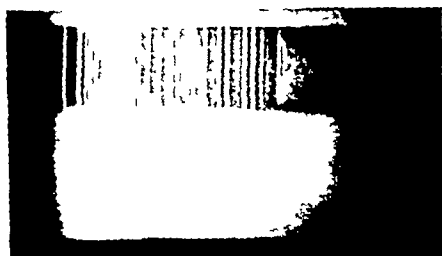


Fig 2—Spectrogram of the umbellulone on guinea pig blood



Fig 3—Rabbit gut. Effect of 1 cc of 1/100 solution of umbellulone, giving a dilution of 1-40 000. (A) Normal, (B) Partial paralysis, (C) Normal segment. Base line indicates two minute intervals.

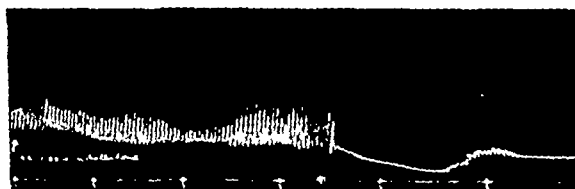


Fig 4—Rabbit gut. Showing progressive loss of contraction (in dilution of 1-13 333 of umbellulone) with period of slight stimulation and complete paralysis of intestinal segment. Time—two minute intervals.



Fig 5—Rabbit gut. Intestinal segment revived in Locke's solution. Time—two minute intervals.

Method

The rabbits and cats were killed by administering an excessive dose of chloroform. The small intestines were immediately removed, care being taken to avoid injury to the intestines. The removed intestines were placed in fresh, oxygenated Locke's solution and kept at 37.5° C.

until used. The segments of the intestines (2.5 to 4 centimeters in length) were suspended in four hundred cc of Locke's solution through which a stream of oxygen was bubbling continuously. The temperature was maintained at 37.5° C by use of a constant temperature bath. Recordings were made on a single drum kymograph, using a Becker universal lever. The umbellulone was prepared in the form of a 1 per cent acacia emulsion. Dilutions of 1:10, 1:100 and 1:1000 were prepared for use in the experiment.

Results

Both cat and rabbit gut when treated with a 1:100,000 dilution of umbellulone showed a slight stimulation with a slight increase in contraction, with tonus and amplitude remaining nearly constant.

Rabbit Gut—Umbellulone in a dilution of 1:40,000 produced a decided decrease in contraction (Fig 3). In a dilution of 1:13,333 umbellulone produced a decided decrease in contraction, tonus and amplitude. This decrease was progressive in nature (Fig 4). On washing gut with fresh Locke's solution the segment was revived (Fig 5).



Fig 6—Cat gut. Effect of 1-5000 dilution of umbellulone on isolated intestinal segment. Time—two minute intervals.

resulting in paralysis of segment (Fig 6). On washing gut with fresh Locke's solution the segment was revived.



Fig 7—Dog. Blood pressure and respiration. Normal B.P. from right carotid artery, normal respiration. Effects from femoral vein injection of 1 cc undiluted umbellulone. Time—ten second intervals.

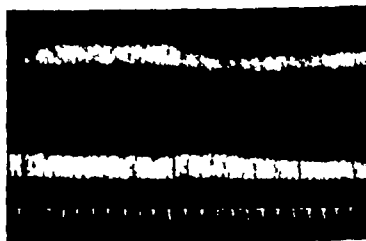


Fig 8—Dog. Blood pressure and respiration. (Continuation of Fig 7). Progressive rise in B.P., increased heart action, rapid (shallow) respiration, and intestinal stimulation. Time—ten-second intervals.

III EFFECTS OF UMBELLULONE ON RESPIRATION AND BLOOD PRESSURE

Dogs were the only animals used in this work. A total of seven dogs was used.

Method

The dogs were weighed and 1.2 cc of 40 per cent chloretone in 40 per cent ethyl alcohol (22) per Kg of body weight were injected intraperitoneally. Two and one-half hours later the dogs were prepared for blood pressure recording (23, 24) by using a Becker U tube mercury manometer for blood pressure and a Becker respiration plethysmograph for respiration. Both respiration and blood pressure were recorded on a single drum kymograph.

Results

Umbellulone, when given intravenously, in a dose of 0.109 cc per Kg of body weight produced a rapid and decided fall in blood pressure (Fig 7). This

Fig 9—Dog Blood pressure and respiration (Continuation of Fig 8) Second femoral injection (1 cc undiluted umbellulone) Effects—failure of respiration, and arrest of heart beat Time—ten second intervals



was followed by a progressive rise in the blood pressure which at no time regained the mean pressure (Fig 8). The injection of a second dose of similar size, as stated above, produced death in a few minutes with failure in respiration followed by arrest of the heart (Fig 9).

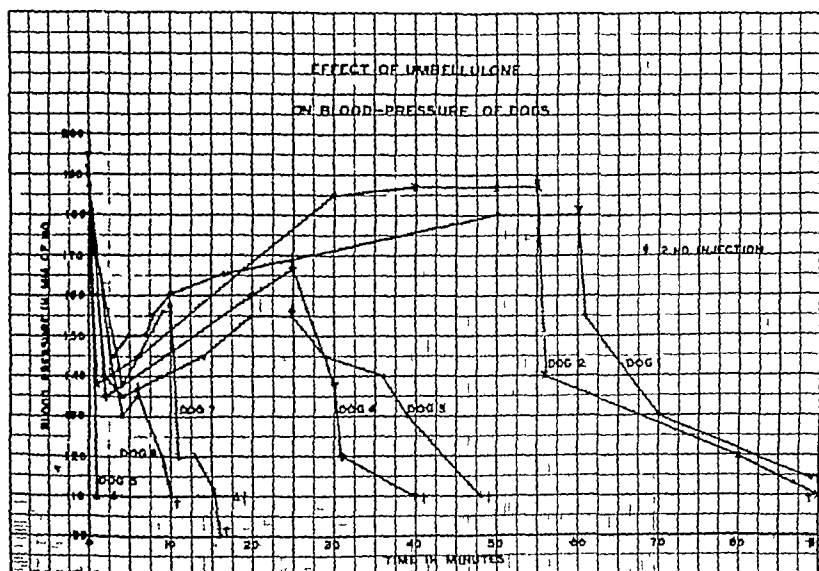


Fig 10

TABLE IV—EFFECTS OF UMBELLULONE ON THE BLOOD PRESSURE AND RESPIRATION OF DOGS

EFFECTS OF UMBELLULONE ON THE BLOOD PRESSURE																
Dogs	Normal Resp B P		10% Umbellulone in Olive Oil				20% Umbellulone in Olive Oil				Undiluted Umbellulone				Death Resulted Min	
			10 Cc Injection Resp B P		10 Cc Injection Resp B P		7 Cc Injection Resp B P		7 Cc Injection Resp B P		1 Cc Injection Resp B P		1 Cc Injection Resp B P			
1	40	200	24	140	3	110										89
2	37	195	22	138	4	110										90
3	27	192					18	135	23	110						48
4	35	195					21	138	25	110						40
5*	28	190										5	110			3
6	58	187										156	135	18	110	9
7	72	180										66	138	12	112	16

* Received 2 cc undiluted umbellulone intravenously

TABLE V—CHLORETONE ANÆSTHESIA COMPARISON ON DOGS

Dogs	Age Months	Sex	Weight Kilos	40% Chloretone Cc	Anæsthesia Time Minutes
1	24	Male	17 0	20 4	8
2	12	Male	11 2	13 5	9
3	15	Female	11 2	13 5	8
4	10	Female	11 2	13 5	15
5	12	Male	11 3	13 8	8
6	9	Male	11 2	13 0	18
7	8	Male	9 7	11 0	20

NOTE Time elapsing between injection of anæsthetic and operation was $2\frac{1}{2}$ hours in each case

Post-mortem examination showed congestion of the lungs with blood clots. The heart stopped in diastole. The heart and the superior and inferior vena cava were dilated as were the other great vessels.

SUMMARY

- 1 Umbellulone in blood produced methemoglobin *in vitro* and *in vivo*
- 2 Umbellulone produced decided hemolysis of human, guinea-pig and horse blood
- 3 Umbellulone injected intraperitoneally in guinea pig caused asphyxiation followed shortly by death
- 4 Inhalation of umbellulone by guinea-pig irritated mucous membranes of eyes and nose caused irregular respiration at times but no failure of respiration
- 5 Umbellulone in dilutions of 1:50 killed *Momtia tropicalis*, and *Trychophyton interdigitale* in 1, 30 and 60-minute contacts. In dilutions of 1:100 the 1-minute contact was positive and the 30 and 60-minute contact negative
- 6 Umbellulone in the presence of blood, peptone and gelatine showed but a slight loss in fungicidal power
- 7 Umbellulone killed *E. typhi* and *Staph. albus* in dilutions as high as 1:500 for 15 minutes contact. The estimated phenol coefficient was 6.25
- 8 Umbellulone produced a decrease in frequency of the frog heart, loss of tonus and a decrease in the ventricle contraction. Stoppage of the heart occurred in diastole. Atropine, caffeine or adrenaline injected into the right atrium had no effect upon the paralyzed heart
- 9 Results obtained on frog heart showed that umbellulone probably acts upon the same nerves and fibres as does atropine
- 10 Umbellulone on isolated segment of rabbit and cat in 1:100,000 dilution produced slight stimulation, in dilutions of 1:40,000 or less, produced an apparent state of depression which progressed into partial paralysis. The length of time the paralysis was in effect depended on the degree of concentration of the solution, the more concentrated the solution the longer and the more complete the paralysis
- 11 Intravenous injections of umbellulone caused a lowering of blood pressure and failure of respiration in dogs
- 12 The clinical results and post-mortem examinations indicated that
 - a Umbellulone probably acts as a depressant
 - b Umbellulone produces rapid methemoglobin

- c Umbellulone apparently caused pulmonary circulation to be blocked
- d Umbellulone causes vaso-dilation of the heart and large vessels
- e The minimal lethal dose of umbellulone in dogs is about 0.178 cc per Kg of body weight, death being due to failure of the respiration followed in a few minutes by stoppage of the heart

REFERENCES

- (1) Jepson, W L, "The Silva of California," 2, 243, University Press, Berkeley (1910)
- (2) Douglass, D, "Douglass' Journal," 67 (1823-1827), W Wesley and Son (1914)
- (3) Benson, G T, "Trees and Shrubs of Western Oregon," 2, 67, Stanford Publication (1930)
- (4) Heaney, H, PROCEEDINGS OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, 23 105 (1875)
- (5) Stillman, J M, *Amer Chem J*, 2, 38 (1880)
- (6) Powers, F B, and Lee, F H, *Jour of Chem Soc*, 85, 629 (1904)
- (7) Tutin, F, *Ibid*, 89, 1104 (1906), *Ibid*, 93, 252 (1908)
- (8) Semmler, F W, *Chem Abs*, 2, 837 (1908)
- (9) Spiegel, L, "Chemical Constitution and Physiological Action of Drugs," 73-76, D Van Nostrand Co (1915)
- (10) Parry, E J, "Chemistry of Essential Oils," 237, Scott, Greenwood and Sons (1908)
- (11) Sawyer, J C, "Odorographia," "A Natural History of Raw Materials and Drugs Used in the Perfume Industry," 64, Gurney and Jackson (1894)
- (12) Wienhaus, H, and Todenhofer, K, *Berichte der Schimmel and Co*, 285, Jubileums Ausgabe (1929)
- (13) Kamm, O, "Qualitative Organic Analysis," Ed 2, 129, John Wiley and Sons (1932)
- (14) Russell, E R, *Thesis*, Oregon State College Unpublished (1929)
- (15) Dessemontit, E, *J Pharmacol and Exper Therap*, 31, 377 (1927)
- (16) Halliburton, W D, "The Essentials of Chemical Physiology," Ed 11, 249, Longmans, Green and Co (1922)
- (17) Pembrey, M S, and Phillips, C D F, "The Physiological Action of Drugs," 5, Edward Arnold, London (1901)
- (18) F D A, *U S D A Circular No 198*, 11-12 (1931)
- (19) Miller, Ruth, *Am J Pharm*, 103, 324 (1931)
- (20) Kingery and Adkison, *Arch Dermat and Syphilol*, 17, 499 (1928)
- (21) Salant, W, and Mitchell, C W, *J Physiol*, 39, 355-374 (1916)
- (22) Kamm, O, Aldrich, T B, Grote, I W, Rowe, L W, and Bugbee, E P, *J Am Chem Soc*, 50, 581 (1928)
- (23) Jackson D E, "Experimental Pharmacology," 37, 85, Mosby and Co (1917)
- (24) Pittenger, P S, "Biologic Assays," Ed 2, 67-68, P Blakiston and Sons Inc (1928)

FURTHER STUDIES ON PSYLLIUM SEED * ¹

BY HEBER W YOUNGKEN

In an article entitled "Studies on Commercial Psyllium Seeds" which appeared in Vol XXI, No 12, pages 1265-1273 of the JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, the writer discussed some earlier studies he had made on various commercial varieties of Psyllium. Since that time he has examined new lots of Psyllium seeds imported from Spain and France. He has also studied plants with mature fruit and seed bearing spikes from growers of commercial Psyllium seeds in France and Spain, and has compared these materials with authentic

* Scientific Section, A Ph A, Washington meeting, 1934

¹ Massachusetts College of Pharmacy

herbarium specimens in local herbaria and with standard descriptions of the species involved by Post (1), Reichenbach (6) and Hegi (2), thus enabling identification of the plants. Commercial seeds of *Plantago psyllium* L and of *Plantago arenaria* Waldst et Kit [*P. ramosa* (Gilibert) Aschers] were planted in pots in a greenhouse and plants reared therefrom which compared favorably with descriptions of these species in the literature.

The seeds from a large number of recent commercial lots of Psyllium labeled French and Spanish Psyllium were also compared with seeds obtained from the fruits of the identified mature plants furnished by French and Spanish growers of Psyllium and the sources of four different kinds of seeds definitely established. It was found that most of the samples (in original packages with a Spanish label) labeled "Spanish Psyllium" were yielded by *Plantago psyllium* L, a few by *Plan-*



Fig 1—*Plantago psyllium* L
Upper portion of leaf and flowering
stem $\times \frac{5}{13}$



Fig 2—*Plantago arenaria* W et K
Terminal portions of leaf and flowering
branches $\times \frac{5}{13}$

tago arenaria Waldst et Kit and a number (with English labels) by *Plantago lanceolata* L, the last species being also the source of German Psyllium, also that most of the more recent "French Psyllium" samples were yielded by *Plantago arenaria*, a number by *Plantago psyllium* while occasional lots contained mixtures of *P. arenaria*, *P. psyllium* and *P. Cynops* or of *P. arenaria* and *P. Cynops*. It has also been ascertained that the seeds of *Plantago lanceolata* L, previously described by the writer (4) are torrefied abroad and mixed with untoasted seed of *Plantago arenaria* and offered in this combination to the American trade as French or Black Psyllium Seed.

A binocular dissection microscope was employed in the examination of the external morphology of the seeds. Cross sections were then made through the region of the cotyledons and raphe, mounted in glycerin and alcohol as well as in water and then studied under the compound microscope. The mucilage swelling factors were ascertained by the method outlined in a previous paper by the author (3).

From the studies made, the following descriptions are given for three authentic seeds of caulescent species of *Plantago* variously found in lots of French and Spanish Psyllium seeds

PLANTAGO PSYLLIUM SEED

The seeds examined were hemianatropous, silky to the touch, ovate to ovate elongate, larger at one extremity than the other, concavo convex, light brown to chestnut brown, dark brown along the margin, very shining, mostly from 1.28 mm to 2.72 mm in length, rarely up to 3 mm, and from 0.6 to 1.12 mm in breadth, the convex dorsal surface smooth, somewhat transparent and showing beneath the seed coat a light brown longitudinal area representing the straight embryo, extending nearly the length of the seed, the hypocotyl being in the broader end and the cotyledons in the narrower end, the concave surface showing a large cavity, limited by the border which is raised as a cushion. The curved edge of the cushion forms a pointed, obtuse or right angle with the internal face of the cavity. In the center of the base of this cavity is an oval white scar representing the hilum. Occasionally, the raphe is present attached to one edge of the seed. A transverse fissure or groove is usually visible on the convex side and edges of most of the seeds. This is nearer the broader than the narrower extremity, and just over the point of union of hypo-



Fig 3—*Plantago cynops*
L. $\times \frac{5}{13}$

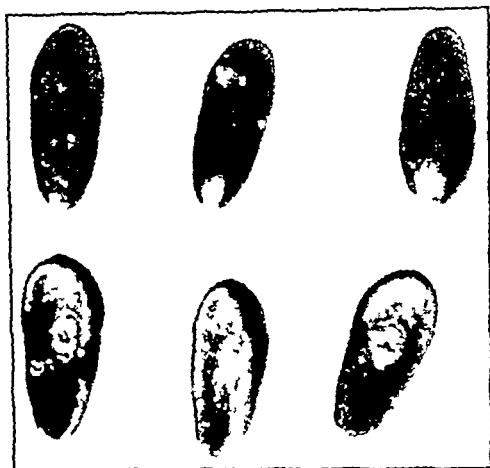


Fig 4—Seeds of *Plantago psyllium* L. $\times 10$

cotyl and cotyledons. On the broader end of the seed may be seen the dark brown marks of the fusion of the seed coat at the end of the groove. The seeds are silky to the touch. 100 seeds weighed 0.072 Gm.

Upon soaking the seed in water, the seed coat swelled and the seed became enveloped with a transparent, colorless mucilage. When the swelling phenomenon is observed under the microscope, it is noted that the epidermal cells elongate and their outer and radial walls become transformed to mucilage. The mucilage swelling factor in 24 hours varied from 12 to 16, and in 48 hours was up to 35.

Histology—Transverse sections of *P. psyllium* seed cut through the central region possess a reniform outline and present for examination a spermoderm, endosperm and embryo. The spermoderm shows (1) an outer epidermis of mucilaginous epidermal cells with more or less obliterated walls in glycerin mounts the radial and inner walls of which swell and disintegrate to form a clear mucilage upon irrigation of the mount with water, (2) a pigment layer with brown amorphous content. Directly beneath the spermoderm lies the broad endosperm, composed of irregular shaped, thick-walled cells with walls of reserve cellulose and intercellular-air-spaces. The outer layer of this region consists of palisade cells which range from 15μ to 34μ , rarely

to about 40μ in height. The contents of these endosperm cells consist of aleurone grains and fixed oil.

The straight embryo lies in the center of the endosperm and consists of 2 elongated, plano convex cotyledons and a cylindrical hypocotyl. The cells of the embryo contain aleurone grains of varying shape up to 8μ in diameter and fixed oil. Three plerome bundles extend through the mesophyll of each of the cotyledons.



Fig 5—Seeds of *Plantago arenaria* W et K $\times 9$

PLANTAGO ARENARIA SEEDS

The seeds observed differed from those of *P. psyllium* by the following characters.

They were darker brown to maroon in color, ovate oblong to elliptical, less shiny often dull, and rough and reticulate on the outer surface with a median transverse groove or fissure or dent more distinct and usually nearer an equal distance from the two extremities than in *P. psyllium* and *P. cynops* seeds. The ventral or concave surface shows averagely a broader cavity than in *P. psyllium* seed and the edge forms a somewhat flattened cushion instead of a rounded one. Moreover, as François (5) has shown, this edge forms a sharp

indented angle with the base of the cavity. The size of *P. arenaria* seeds ranged from 1.6 mm to 3 mm in length and from 0.96 mm to 1.5 mm in breadth. The hilum at the bottom of the cavity was pale brown to occasionally whitish. 100 seeds weighed 0.0842 Gm. Their mucilage swelling factor in 24 hours was averagely 8, whereas that of *P. psyllium* seed was averagely 14 and varied from 12 to 16. The palisade cells of the endosperm were from 15μ up to about 52.5μ in height.

PLANTAGO CYNOPS SEEDS

This seed is larger than those of the other two species, ranging from 3 to 4 mm in length and up to 2 mm in breadth. It is ovate oblong, enlarged at one extremity and strongly contracted at the other, dull brown to dull greenish brown, with a transverse depression nearer the broader than the narrower end. It is convex on the dorsal surface with a broad deep concavity on the ventral surface which is open at the contracted end. The edges are curved into the cavity. A whitish hilum is found at the base of the ventral cavity. 100 seeds weighed 0.1649 Gm. The palisade cells of its endosperm were from 15μ to 48.75μ in height.

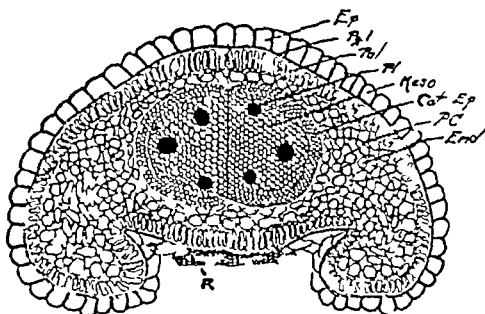


Fig 6—Transverse section of *Plantago arenaria* seed $\times 40$

Ep, epidermis and Pgl, pigment layer of seed coat, Pal, palisade layer of endosperm, End, inner region of endosperm which contains fixed oil and aleurone but no starch, PC, protoplasmic connections between inner endosperm cells, Cot, Ep, epidermis of cotyledon, Meso, mesophyll of cotyledon, P, plerome bundle, R, raphe.

The mucilage swelling factor of one lot taken after 24 hours was 1 and after 48 hours 1.5. The writer anticipates additional work on the mucilage swelling factor of this seed as more material becomes accessible.

CONCLUSIONS

1 It is ascertained that good French and Spanish Psyllium Seeds of the current American market are yielded by *Plantago psyllum* and *Plantago arenaria*

2 *Plantago psyllum* seed is superior to *Plantago arenaria* seed in mucilage swelling capacity

3 Most of the French Psyllium seed is now yielded by *Plantago arenaria*, less by *P psyllum* while occasional lots contain mixtures of *P arenaria*, *P psyllum* and, rarely, *P Cynops*

REFERENCES

- (1) Post, G E, 'Flora of Syria, Palestine and Sinai' pages 671-672 (1896)
- (2) Hegi, Gustav, 'Illustr Flora von Mittel Europa,' Bd vi, page 193
- (3) Youngken, H W, Jour A Ph A, 21, 1272 (1932)
- (4) *Ibid*, pages 1269-1271
- (5) François, L 'Différents Types de Graines du Genre Plantago,' Dunod, Paris, 7-9 (1933)
- (6) Reichenbach, H G L, "Incones Floræ Germanicæ et Helveticæ," 17, Pl 1135, 1136 (1855)

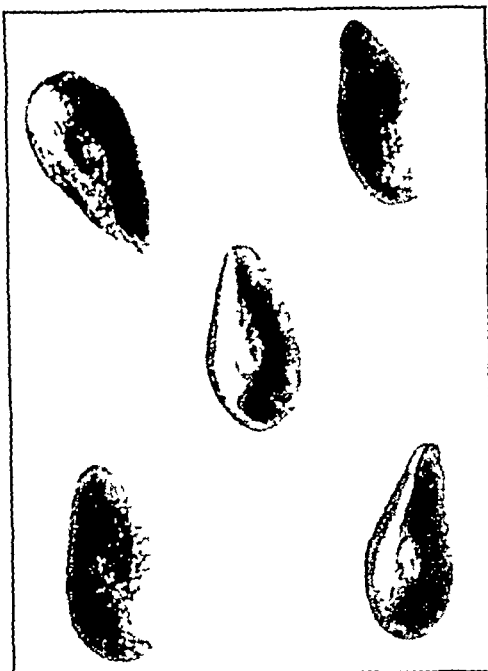


Fig 7—Seeds of *Plantago Cynops* L. $\times 65$

CRYSTALLINE FORMS OF EPHEDRINE ALKALOID *

BY E E MOORE AND D L TABERN

Ephedrine alkaloid as it appears on the market was found to exist in two forms, one containing about 95 per cent of the alkaloid, and five per cent of water, while the other assays nearly 100 per cent. Although the former is crystalline, while the latter is usually an oil or a rock-like solid, assays of the latter indicated that the more nearly the composition approached the anhydrous, the higher the melting point.

Emde (1) reported an ephedrine hydrate containing about 10 per cent of water which would correspond to one mol of water for each mol of ephedrine. However, samples of hydrated ephedrine obtained from different manufacturers, or prepared by recrystallizing the alkaloid from water, were assayed in this laboratory and found always to contain about 5 per cent of water. This would correspond to a hemi-hydrate, rather than a hydrate.

The purpose of this work was to prove that the hemi-hydrate is the usual hydrate of ephedrine, to determine the melting point of anhydrous ephedrine, and to ascertain the effects of different amounts of water on this melting point.

* Abbott Laboratories, North Chicago, Ill

Received October 17, 1934

METHOD

Ephedrine alkaloid N N R was distilled at 25 mm. Any water which was present came over quickly. When the temperature reached 150°, the receiver was changed and distillation continued. The anhydrous base boiled over within the range, 151–153°. A number of different distillates solidified within the range, 38.0–38.1°.

Fifteen to 30 Gm. of the molten anhydrous alkaloid obtained above accurately weighed was placed in a small round bottom flask, fitted with a stopper having holes for an Anschutz thermometer and a stirring rod. The apparatus was cooled to 30° C. and the ephedrine seeded with a small crystal of anhydrous base. The mass was stirred and the temperature rose to a constant value—the solidification temperature—where it remained for some time.

The mass was melted, a known weight of water added and incorporated thoroughly with the ephedrine. The solidification temperature was determined by the same procedure used for the anhydrous base.

The above was repeated, adding successive small quantities of water, until the desired number of values was obtained.

Three such experiments were carried out, using different samples of anhydrous base and the points obtained were found to fall on the same curve. (Table I), (Curve I), Fig. 1.

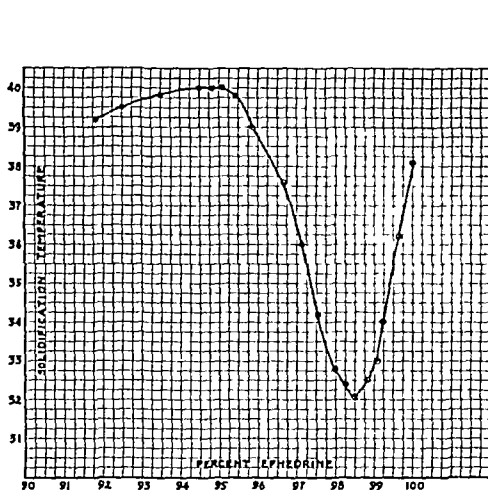


Fig 1 —Solidification temperature

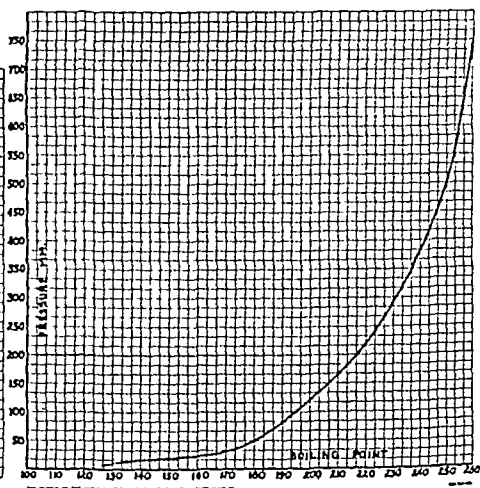


Fig 2

The values for the anhydrous base and for the base with a half mol. of water were checked by melting point determinations.

The solidification temperature can be determined with as little as 2 Gm. of ephedrine, if a small insulated test tube is employed as the container. This modified technique has been found to be very useful as a rapid method of determining the purity of the alkaloid.

Anhydrous ephedrine melts at 38.1°. The addition of water lowers the melting point until with 1.5 per cent a eutectic mixture, ephedrine-ephedrine hydrate melting at 32.1° is obtained. Further addition of water raises the melting point until with five per cent a maximum of 40° occurs. The composition of this last substance corresponds closely to that of a hemi-hydrate.

Incidental to the purification of anhydrous ephedrine base by distillation, the boiling point was determined at various pressures in the range of 65 and 760 mm. (Table II), (Curve 2), Fig. 2. This supplements the data between 7 and 25 mm. reported in the A. D. M. A. proceedings for 1933. (2) Above 250° slow decomposition seemed to ensue.

TABLE I—SOLIDIFICATION TEMPERATURES SYSTEM, EPHEDRINE-WATER

Per Cent		Solidification Temperature	Per Cent		Solidification Temperature
Ephedrine	Water		Ephedrine	Water	
100 00	0 00	38 1	97 15	2 85	36 0
99 65	0 35	36 2	96 65	3 35	37 6
99 25	0 75	34 0	95 85	4 15	39 1
99 10	0 90	33 0	95 45	4 55	39 8
98 80	1 20	32 5	95 10	4 90	40 0
98 50	1 50	32 1	94 85	5 15	40 0
98 45	1 55	32 1	94 50	5 50	40 0
98 25	1 75	32 4	93 50	6 50	39 8
98 00	2 00	32 8	92 50	7 50	39 5
97 55	2 45	34 2	91 85	8 15	39 2

TABLE II

Press Mm	B Pt	Press Mm	B Pt
745	260	65	185
645	257	32	172
545	253	A D M A Proc 1933 (2)	
445	246	25	152-153
345	237	20	146-148
245	224	10	132-133
145	205	7	127-128

When the distilled anhydrous base was crystallized from an anhydrous medium, such as dry ether, crystals were obtained which analyzed 100 per cent ephedrine. When crystallized from water or dilute alcohol, the crystals analyzed 95 per cent. The anhydrous crystals were very hygroscopic, while the hydrated material did not tend to take up or give off water.

Dr George L. Clark has kindly studied the crystalline forms of the anhydrous and hydrated bases and found them to be different.

SUMMARY

Crystalline anhydrous ephedrine was prepared and its melting point determined.

The existence of a hemi-hydrate of ephedrine containing 95 per cent of the base was proved. The anhydrous and hydrated alkaloids differ in crystalline form, melting point, stability and solubility in oil.

The effects of different amounts of water on the melting point of ephedrine were determined.

REFERENCES

- (1) Emde, H., *Helv Chim Acta*, 12, 365 (1929)
- (2) Am Drug Mfrs Assoc, *Proc*, 235 (1933)

DISPENSARY SERVICE

Dispensary service owes its existence to the great London fire in 1666. The Pennsylvania Hospital established the first dispensary in this country (1751).

PHYTOCHEMICAL NOTES

FROM THE LABORATORY OF EDWARD KREMERS

No 111 THE STEROLS FROM *MONARDA FISTULOSA*

BY OLE GISVOLD

The unsaponifiable material prepared by E J Ireland from the saponified fatty oil obtained from the leaves of the wild bergamot was imperfectly crystalline. The several fractions submitted were combined, dissolved in ether, alcohol added to the ethereal solution, also some charcoal. The mixture was heated to boiling for a few moments and then filtered. After filtration, the ether was evaporated off and water added to the hot solution until the precipitate produced just redissolved.

Upon recrystallization beautiful leaflets were thus obtained. They melted at 130–131° and showed no change in melting point after drying at 100° also over P₂O₅ in a vacuum.

The sterol was acetylated. The acetylated product, upon crystallization, melted at 115°. Upon recrystallization the product softened at 115° and became clear at 118°.

The absence of stigmasterol was indicated when tested for by the method of Windaus and Hauth.¹ However, reinvestigation of larger amounts, when available, may yet prove the presence of stigmasterol with a sitosterol.

The Therapy of the Cook County Hospital Edited by BERNARD FANTUS, M D, Chicago—In their elaboration, these articles are submitted to the members of the attending staff of the Cook County Hospital by the director of therapeutics, Dr Bernard Fantus. The views expressed by various members are incorporated in the final draft for publication. The series of articles will be continued from time to time in the columns of the *Journal A M A*.

The following prescriptions were selected from one of a series of articles in the *Journal A M A* by the *Prescriber* and edited by this publication in accordance with the British Pharmacopœia.

RUBEFACIENT PIGMENT

R ¹ Menthol	2.0 Gm
Volatile Oil of Mustard	2.0 ml
Alcohol (95 per cent)	50.0 ml

Mix. Apply a few drops to the affected area
(Avoid the vicinity of the eyes)

ANALGESIC PIGMENT

R ¹ Camphor	
Chloral Hydrate	
Menthol, of each	30.0 Gm
Alcohol (95 per cent) to make	120.0 ml

Mix. Paint over painful area

COMBINED ANALGESICS

Dry Extract of Hyoscyamus	0.15 Gm
Acetanilid	1.00 Gm
Acetylsalicylic Acid	5.00 Gm

Mix and divide into 15 capsules. One every two to four hours as required. (The analgesic effects of acetanilid and acetylsalicylic acid are enhanced by this combination and the sudorific effect is arranged by the hyoscyamus.)

BENZOCAINE CAMPHOR OIL

R ¹ Benzocaine	2.0 Gm
Liniment of Camphor to	100.0 ml

Mix. Apply freely on gauze as a dressing for painful wounds or ulcers.

¹ *Ber.*, 39, 4381 (1906)

EMINENT AMERICAN PHARMACOGNOSISTS OF THE NINETEENTH CENTURY

BY HEBER W. YOUNGKEN

(Concluded from page 152, February Journal)

ALBERT SCHNEIDER (1863-1928)

Albert Schneider was born in Granville, Illinois, April 13, 1863. His boyhood days were spent on his parent's farm in McLean County, Illinois, where he worked during the summer and attended the district schools for a few months each winter. At the age of seventeen he entered Valparaiso, Indiana Normal School, where he intended to prepare for medicine but was compelled to relinquish his studies after about six months on account of an attack of inflammatory rheumatism. After recovering he entered the Dixon, Illinois Normal School and completed his preparatory studies. He then went to Chicago for the study of medicine. He was graduated from the College of Physicians and Surgeons of Chicago in 1887, the same year he received his Bachelor of Science degree from the University of Illinois. He took graduate work at the University of Minnesota and obtained his M. Sc. from that institution in 1894, and his Ph. D. from Columbia University in 1897. He held the Fellowship in Botany at Columbia for two years, making a special study of Lichens. During a portion of his stay at the University of Minnesota he served as Instructor in Botany in that institution.



ALBERT SCHNEIDER

After graduation from Columbia he was called to the chair of Pharmacognosy and Bacteriology in the Northwestern University School of Pharmacy where he remained until 1903. From 1903-1919 he served as professor of Pharmacognosy and Bacteriology, and from 1904-1906 as professor of Materia Medica and Therapeutics in the University of California. While there he also filled outside positions. From 1906-1907 he was director of the Spreckel's Sugar Company Experiment Station, and from 1909-1915 pharmacognosist for the U. S. Dept. of Agriculture, from 1915-1919, microanalyst of the California State Food and Drug Laboratory, and from 1910-1915 was editor-in-chief of the *Pacific Pharmacist*. In 1919, he resigned his position at the University of California to accept the chair in Pharmacognosy at the University of Nebraska which he held until 1922 when he was called to the position of dean of the School of Pharmacy of North Pacific College, Portland, Oregon. He served for many years as a member of the Revision Committee of the United States Pharmacopœia on which he helped draft the monographs on powdered vegetable drugs. He was president of the American Conference of

Pharmaceutical Faculties from 1913-1914, and lecturer for several years in the Portland Police School and summer school of the University of California on crime investigations

Professor Schneider's activities covered a wide field, he possessed a profundity of thought and a versatility of knowledge. He was always outspoken with his opinions. He was a frequent contributor of scientific articles upon microscopical subjects in which he was an investigator of marked ability. He also wrote on Coto, Paracoto, Winter's Bark and many other themes. His outstanding works were as follows: "Primary Microscopy and Biology," 1890, "Text-Book on General Lichenology," 1897, "Guide to the Study of Lichens," 1898, "Microscopy and Micro-Technique," 1899, "Hints on Drawings for Students of Biology," 1899, "General Vegetable Pharmacography," 1900, "Powdered Vegetable Drugs," 1902, "Bird and Nature Study Chart Manual," 1903, "Medicinal Plants of California," 1909, "Pharmaceutical Bacteriology," 1920, "The Microbiology and Analysis of Foods," 1920, and a "Translation of Westermaier's Compendium der Allgemeinen Botanik," 1896

Dr Schneider became internationally known for his work in the later years of his life on crime detection. He was an inventor of a lie detector, and also of a ventilating system for Pullman cars.

He died suddenly as a result of a cerebral hemorrhage on October 27, 1928, while on his way to the college.

HENRY KRAEMER (1868-1924)

Henry Kraemer was born in Philadelphia, Pa., July 22, 1868. He received his early education in Girard College from which he graduated in 1883. He then

entered the drug store of Dr. Clement B. Lowe where he served an apprenticeship of five years, attending the Philadelphia College of Pharmacy during part of this apprenticeship from which institution he was graduated in 1889 with honors. During his senior college year and the following year he served as assistant in general chemistry to Professor Sadtler at the University of Pennsylvania.

In 1890 he became Instructor in Botany and Pharmacognosy in the College of Pharmacy of the City of New York. Desiring further training in the natural sciences, he took a special course in botany at Barnard College and in 1891 entered the School of Mines of Columbia University from which he graduated with a Ph.B. in 1895. While a senior at Columbia he was elected Professor of Botany, Pharmacognosy and Materia Medica in the School of Pharmacy of Northwestern University with one year's



HENRY KRAEMER

leave of absence before entering on his duties. He spent this year abroad at the

University of Marburg (Germany) studying under Meyer, Cohen, Zincke and Melde, and received the degree of Ph D cum laude in June 1896 His doctorate thesis was on "Viola tricolor " He then assumed his duties at Northwestern University but resigned at the end of the year to accept the chair in Botany and Pharmacognosy at the Philadelphia College of Pharmacy in the Fall of 1897

In 1899 he became editor of the *American Journal of Pharmacy*, succeeding Professor Henry Trimble, and he made a large number of contributions to this *Journal* during his nineteen years of editorship

While at the Philadelphia College of Pharmacy he became a voluminous contributor to the literature of botany and pharmacognosy He wrote textbooks on botany and pharmacognosy, applied and economic botany, and scientific and applied pharmacognosy, he also published many papers on a variety of topics pertaining to pharmacognosy, the outstanding of which are as follows "Calcium Oxalate Crystals in the Study of Vegetable Drugs," "Effect of Heat and Chemicals on the Starch Grain," "Some New Methods in the Study of the Commercial Starches," "Valuation of Vegetable Drugs and Foods," "Microscopical and Chemical Examination of Cloves," "Assay of Drugs by the Use of Living Plants," "The Nature and Structure of Cochineal," "Substitution of the Fruits of *Rhus Typhina* for *Rhus Glabra*," "Histology of the Rhizome and Roots of *Phlox Ovata*," "Adulteration of *Marjoram* and *Coriaria*," "Some of the Distinguishing Morphological Characters of *Belladonna* and *Scopola*," "Plant Colors," and "Color Standards of Powdered Vegetable Drugs "

In addition to his regular courses, he introduced and carried on special courses at the college on the microscopical examination of foods and technical products and in bacteriology He was always popular with his students, many of whom sought his counsel

In 1900 he became a member of the Committee of Revision of the United States Pharmacopœia and was made chairman of the Sub-Committee on Botany and Pharmacognosy which position he held through the revision period of 1910 and a portion of the period of 1920 He was president (in 1917) of the American Conference of Pharmaceutical Faculties and the Philadelphia Botanical Club

In 1917 he resigned his position at the Philadelphia College of Pharmacy to become Dean and Professor of Pharmacognosy at the University of Michigan In 1920 he resigned from this position and moved to Mount Clemens, Michigan, where he opened an office and laboratory as a consulting bacteriologist and chemist He died at Mount Clemens, September 9, 1924

LUCIUS E SAYRE (1846-1924)

Lucius Elmer Sayre was born in Bridgeton, New Jersey, November 2, 1846, where he received his early education in the public schools and as an apprentice in the drug store of Robeson and Whitaker In the early sixties he came to Philadelphia and clerked in the drug store of Dr L Updycke while attending the Philadelphia College of Pharmacy from which he graduated in 1866 He then obtained a position in the pharmaceutical laboratory of Frederick Brown and, later, with Henry C Blair's Sons, Apothecaries, in Philadelphia

Sayre was a close friend and classmate of Professor Remington and in 1879 they opened a drug store as partners at 18th and Market Streets, Philadelphia, in which they manufactured a number of pharmaceuticals including scale pepsin. During the partnership, Sayre became a quiz master in materia medica of the Alumni Association of the Philadelphia College of Pharmacy and lecturer on pharmacy in the Women's Medical College of Philadelphia.

Upon the founding of the School of Pharmacy at the University of Kansas in 1885, Mr Sayre was elected dean and also professor of Materia Medica and Pharmacy. In 1907, Professor Sayre became director of drug analysis for the Kansas State Board of Health and a member of the botanical staff of the Kansas State Board of Agriculture.



LUCIUS E SAYRE

He received an honorary Bachelor of Science degree from the University of Michigan in 1896 and the Master of Pharmacy degree from the Philadelphia College of Pharmacy in 1897. He was a member of the Revision Committees of the United States Pharmacopœia of 1890, 1900 and 1910, chairman of the Scientific Section in 1893 and of the Historical Section of the A. P. H. A. in 1917, and president of the AMERICAN PHARMACEUTICAL ASSOCIATION, 1919-1920.

Professor Sayre contributed a variety of papers embracing historical, botanical, pharmacognostical and chemical subjects. He was especially interested in the proximate analysis of vegetable drugs and foods. He wrote several papers on the alkaloids of Gelsemium and others on the analysis of *Gymnocladus* Seed, "Assay of *Datura Stramonium*," "*Cactus Grandiflorus*," "Drug-Eating Insects," "Drug Culture," "*Euphrasia*," "*Oregon Balsam*," "Golden Seal Gardens," "Characters of Distinction of *Viburnum Prunifolium* and *Viburnum Opulus*," and "*Viburnum* Barks, Microscopical Distinctions." He collaborated with D. H. Robinson, professor of Latin at the University of Kansas, on Robinson's *Latin Grammar of Pharmacy and Medicine*. His best known work was "*Organic Materia Medica and Pharmacognosy*" which extended through four editions.

He died at Lawrence, Kansas, on July 21, 1924. Professor Sayre was a leader in the development of the teaching of materia medica and pharmacognosy, a modest yet impressive worker, and a great figure in American Pharmacy.

OTTO A. WALL (1848-1922)

Otto Augustus Wall was born in St. Louis County, Missouri, on September 27, 1848, the son of a German clergyman. He received his early education in the schools of St. Louis and in 1864 entered the drug store of Dr. Sanders. During his apprenticeship under Dr. Sanders he attended the St. Louis College of Phar-

macy from which institution he graduated in 1868. He then entered the Missouri Medical College, receiving his M D in 1870. He also graduated from the Bellevue Hospital Medical College, New York, in 1871. From 1869-1873 he was proprietor of a drug store in St. Louis.

Upon returning to St. Louis he became professor of *Materia Medica*, Pharmacognosy and Botany in the College of Pharmacy, a position which he held for forty-nine years. He was also professor of Therapeutics and *Materia Medica* in the Missouri Medical College.

In 1882 he and Dr. Oldberg established the Oldberg-Wall Laboratory. At one time he was a member of the editorial staff of the *National Druggist* and editor of the college publication. He was a member of the U S P convention from 1880-1920 and a member of the U S P Revision Committee 1880-1900, and presided over the U S P convention of 1910. He was also president of the Missouri Pharmaceutical Association from 1883-1885.

Dr. Wall was a large man with an impressive bearing. He was affable and warm hearted, very apt with the pen and brush and an excellent parliamentarian. His brain was a vast storehouse of facts covering a wide field of general knowledge and he was a very popular teacher. He was noted for the study of sections of drugs with the microscope and for making lantern slides of these.

His best known contributions in pharmacognosy are his "Notes on Pharmacognosy," and "Handbook of Pharmacognosy," the fifth edition of which was revised in 1928 by Professor Leo Suppan. Wall was also author of "The Prescription," "Latin for Pharmacy and Medical Students," "Sex Worship," etc. He was co-author with Dr. Oldberg of "The Companion to the Pharmacopœia." He also wrote a number of papers, the last of which entitled "Vegetable Taxonomy" was presented at the 1916 meeting of the A. P. H. A.

Professor Wall died of heart failure on February 13, 1922, in his 76th year.



OTTO A. WALL

MEETING OF THE NATIONAL ACADEMY OF SCIENCES AND OF THE EXECUTIVE COMMITTEE OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

The annual stated meeting of the National Academy of Sciences will be held under the presidency of Dr. W. W. Campbell, in the building of the academy at Washington, on April 22nd, 23rd and 24th. The autumn meeting will be held at the University of Virginia on November 18th, 19th and 20th.

The spring meeting of the Executive Committee of the American Association for the Advancement of Science will be held in New York City on April 14th. Communications to be brought to the attention of the committee should be sent to the permanent secretary, the Smithsonian Institution Building, Washington, D. C.

HISTORY OF HAMAMELIS (WITCH HAZEL),*¹ EXTRACT AND DISTILLATE

BY JOHN URI LLOYD AND JOHN THOMAS LLOYD ²

In 1865, the senior member of the writers of this treatise was acting as clerk in the establishment of W J M Gordon and Brother, Ninth and Central Avenues, Cincinnati, Ohio

Mr Gordon specialized in physicians' supplies, and made a feature of the "Concentrations" and other Eclectic preparations, then rapidly coming into favor This was natural, as the Gordon establishment was but two blocks from the Eclectic Medical Institute, Court and Plum Streets Drs King and Scudder, and other professors of the Institute, were patrons of the Gordon establishment, and contributed, constantly and helpfully, to Mr Gordon's pharmaceutical researches They naturally fraternized with the physicians of other schools, who met in Gordon's large, comfortable and hospitable front room, where all, alike, considered themselves at home A "No Man's Land" it was, but one of cheer and helpfulness, not of war, personalities and misrepresentation The physicians who there met, differed in views, but they personally respected each other's ideals and processes They had no desire to suppress the efforts of others who were endeavoring to serve the needs of the American people That was left to medical politicians

At that time, 1865, Mr Gordon had in his employ a business representative named Leon Hurtt, a brother of F W Hurtt, a banker in New York City Through Leon, F W Hurtt proposed to purchase the right to make the preparation then known as "Pond's Extract" The senior writer of this chronicle well remembers when, in his presence, Leon Hurtt informed Mr Gordon (who, I was told, had declined to purchase the Pond Extract rights) that he wished to resign his position with the Gordons, to devote his time to the introduction and sale of the proprietary medicine, "Pond's Extract," it was then used almost exclusively by the Homeopathic medical profession of America, being scarcely known either to other physicians, or to the public generally

In one of my visits (J. U L) to Los Angeles, California, I learned that Leon T Hurtt was yet living, a resident of that city I located his home, and in 1915 made him a personal visit, with the object of obtaining from him an authoritative statement concerning the history of Pond's Extract, as well as his connection therewith In this and other later visits, he gave me in detail the history of the preparation, which was first a water-made extract, but is not now an "extract," although established and sometimes sold under that title I have not hesitated to utilize Mr Hurtt's words verbatim, as a part of this paper

To the foregoing I will add that in my opinion the story herein told could not, at the date of my interview with Mr Hurtt, have been handled authoritatively by

* Section on Historical Pharmacy, Toronto meeting, 1932

¹ Especially as related to the distillate, known first under the name "Golden Treasure," then as "Pond's Extract," and next as "Aqua Hamamelidis" (U S P IX) and 'Fluid Extract of Hamamelis' (N F V)

² The illustrations presented in this treatise, unless otherwise credited, are by John Thomas Lloyd The Hamamelis shrub was photographed by him in the New York location where the Oneida Indians lived and the experimental supplies mentioned in this article were obtained by him from the Oneida section

any other person, he being the only living "charter member" of the organization originally known as the "Pond's Extract Company"

Pond's distilled hamamelis was quietly introduced into the Homeopathic school of medicine. Coming gradually into the practice of Eclectic physicians, creeping into that of Allopathic physicians, it finally came into the use of the public generally. The chemist, finding little in the distillate other than alcohol and traces of an essential oil, accepted that distilled hamamelis must, if it had any virtues, depend on the water and the alcohol it contained.

And yet, after many decades have passed, distilled hamamelis stands firmly entrenched as one of the most popular of physicians' favorites, being also largely employed as a toilet application in America. And that, too, in the face of resistance by authority such as Dr. John Marshall, and H. C. Wood, of Philadelphia who, in 1886, made a strenuous scientific laboratory investigation of hamamelis, deciding that there was nothing of therapeutic value in the distillate. Their article ended as follows:

This much used, and still more lauded witch hazel, or the so-called distillate of witch-hazel, must depend for its virtues upon the alcohol they contain, and the faith they inspire." This view is upheld by the *United States* and the *National Dispensatories*, as follows:

"As whatever slight therapeutic virtues witch hazel possesses seems to depend on its tannin it is obvious that this distillate cannot represent the drug." *U S Dispensatory*

'The good that it exerts in the treatment of sprains, bruises, wounds, chilblains, sore eyes, headache, and a host of other conditions, resides more in the activity of a cleansing and evaporating lotion and in the mind of its user, than in any decided curative properties that the preparation may possess.' *National Dispensatory*, 1916

In this connection, I am of the opinion that no claim is made by any maker of the distillate that it represents the fixed astringent principles of the drug. Nor am I convinced that alcohol is the only serviceable content of the distillate.

'Golden Treasure'

As written by Leon T. Hurtt, of the Pond's Extract Company

(Edited slightly in phrase directions L.)

"In the early 1840's, Theron T. Pond, a resident of Utica, New York, became interested in and associated more—or less, with a tribe of Indians known as the Oneida tribe then located in Central New York. He found that they were using for burns, boils and wounds of every description a 'tea' made by their Medicine Man from a species of bush known as 'witch hazel'—a shrub supposed by them to grow only in Central New York. The Medicine Man made his extract by steeping the shrub in an ordinary teakettle. The liquid which he obtained was colored but as clear as water, and had a peculiar aroma obtained from no other shrub.

The 'Witch Hazel' is peculiar (Cuts B & C) in that it blossoms in the fall, producing small, yellow flowers. The medicinal properties of the extract were, in the opinion of the Oneidas, remarkable. A sudden electrical and thunder storm (it was stated) would turn the liquid milky, but within forty-eight to seventy hours it would return to its original clearness.¹

"Mr. Pond, believing in the wonderful medicinal properties of the 'Witch Hazel' tea, decided to learn from the Indian doctor the peculiar species of shrub used. With the Indian Medi-

¹ This needs corroboration. J U L

cine Man he spent several months, searching the underbrush until he fully informed himself of the shrub they employed. He then formed with the Indians a sort of partnership to make the extract, putting it up in a shape to be sold among their friends.



Fig. A—Indian medicine man

"The Medicine Man was extremely particular about the species of shrub used, and its manipulation. He would gather it himself in the woods, bringing it in by the armful, and steeping it at once.

'At first they boiled the shrub in an ordinary iron kettle or cauldron, over a direct fire. Thus they produced a fair article, but they could not preserve it. After studying different preservatives, they finally used about 3% alcohol, but in warm weather that amount of alcohol failed to keep the product, and the alcohol was increased.

They decided to give to their extract the trade name, *'Golden Treasure,'* a name suggested by Mr. Pond. After his death, this name was changed to *'Pond's Extract.'*

'Mr. Pond and the Medicine Man worked together for several years, introducing the product mainly among their personal friends. They finally decided to put the *'Extract'* on the market, and did so, in a local way, in 1848. When we sold the *Pond's Extract Company*, in 1898 there was in the company's safe a two ounce bottle, made in 1848, which was apparently still good. Whether that bottle can now be found, I do not know.

Theron T. Pond died some time between 1847 and 1850. It is said that he lost his life from exposure in the woods.

Between 1846 and 1850, Pond and the Indian Medicine Man sold their business to Hart and Munson, iron foundry men of Utica, New York. They took in with them Isaiah A. Palmer, a friend and neighbor of Theron T. Pond. The business was next sold to a firm in New York

whose name I have forgotten, but as no business of any consequence resulted, the company was sold by the sheriff. It was bought in by Isaiah A. Palmer, who claimed never to have sold his interest therein. It should here be repeated that Palmer, Hart and Munson had given the product the name *'Pond's Extract,'* dropping the name *'Golden Treasure.'*

'Dr. Frederick Humphrey, a Methodist minister, and also a Homeopathic physician, proprietor of the Homeopathic Medicine Company, 562 Broadway, New York, claimed that for years he had been Mr. Pond's family physician, and that Pond had given him the right to manufacture and sell the extract through his *'Humphrey Homeopathic Medicine Company.'* He did indeed, commence to manufacture the same, continuing the name, *'Pond's Extract.'* His claim was denied by Palmer, who commenced suit and applied for an injunction forbidding Humphrey from either using the name *'Pond's Extract,'* or manufacturing the article.

"A party from Connecticut who had worked for the original firm of Pond and the Indian, also claimed that he had the right to make *'Golden Treasure,'* but he was unable to establish his claim.

At that time the *'extract'* was still made by using the old cauldron, over a direct fire. Palmer employed a copper kettle, with a very crude concentrating hood and worm. Cold water was used for condensing the vapor.

"In 1871 or '72, while the lawsuit (*Palmer vs. Humphrey*) was still pending, Mr. F. W. Hurtt, a banker of New York, bought the interest, or the alleged interest, of the Humphrey Homeopathic Medicine Company, and to quiet Palmer, took him into partnership, giving him an eighth interest in the new corporation, which was capitalized at \$100,000.00. At that time, the sale of *Pond's Extract* was less than \$5000.00 per annum.

'Harry Cole, of Cincinnati, myself and F. W. Hurtt of New York, bought the concern, which we reorganized, electing F. W. Hurtt *President*, L. H. Hurtt, *Vice President*, Harry Cole,

Treasurer, and I A Palmer, *Manufacturer* We transferred the company from 562 Broadway, New York, to 76 Williams Street, New York, the firm name now being, F W Hurtt and Brother, Wholesale Druggists The company then had three factories, small and crude, with four kettles at each factory One of these factories (all in New York State), was located at Tightsville, one at Little Falls, and one at Frankfort These three factories I consolidated into one, at Rome, New York, and for four years ran that factory from November, each year, until April or May

"In the meantime Isaiah A Palmer had died, and E D Palmer, the sculptor, became interested with us However, besides holding the office of vice president and running the drug department after I A Palmer's death, I added to my other duties the manufacturing of the Extract

"We then moved from Rome New York, to Chester, Connecticut, the only other locality I knew where the Indian species of Witch Hazel was obtainable¹ I immediately decided to build steam stills,² believing that I could obtain better extract from the shrub than I could with the old-time direct fire, copper kettles This I proved by making an extract nineteen per cent stronger than we had before obtained

"About a year after our purchase of their alleged interest from Dr Humphrey and the Homeopathic Company, Humphrey's Medicine Company sued us for reformation of contract and



Fig B—Witch-hazel
flowers



Fig C—Witch hazel twig showing leaves and
fruit

agreement We in turn enjoined them from using the term 'Pond's Extract,' or from manufacturing that product This lawsuit was in the court for several years

"The day after our charter was issued by the Secretary of State, our president, F W Hurtt, started on a trip around the world It then became my duty to assume the entire responsibility of the company We ran the Extract in connection with our wholesale drug business (F W Hurtt & Brother), but the establishment was inadequate for both the drug and medicine, and the Pond's Extract business We therefore leased a whole building at 98 Maiden Lane, and there we conducted the business for five years, until 1878 On our president's return, and on account of the rapid increase of business, we bought a brick factory in Brooklyn, E D, a four-story building one hundred feet square This was used only for bottling and shipping, and for the Business and Advertising Departments of the Pond's Extract Company Our distilleries were still in Chester Connecticut

"When the bridge crossing East River was built the site of our building in Brooklyn was needed, and F W Hurtt bought the old Belmont home, 76 Fifth Avenue, New York, and No 1, West 13th Street This we remodeled moving into it in 1883 As stated, we were then manu-

¹ For years I made distilled hamamelis from a grove of witch hazel shrubs on the Licking River, Kentucky J U L

² The original "extract" abandoned J U L

facturing our Extract at Chester, Connecticut There we abandoned the old kettle previously employed, changing to 400 gallon copper stills made under my own supervision I understand that the same stills are in use by the Pond Extract Company, at the present time With our new stills, I added about twenty-two and one half per cent to the strength of the extract ¹

"There seems to be only two or three sections of the United States where the true species of Witch Hazel grows, of the quality employed by the Pond Company and the Indian 'Medicine Man' of the Oneidas, namely, Central New York and Connecticut I am told that each year the tribes of Indians on the plains send their Medicine Man East, for their supply of what they term 'Witch Hazel Bush'

"In 1884, our president, F W Hurtt, passed away, and I was elected President of the Company, remaining in that position until I resigned, in 1898 At that time our business was about half a million dollars each year

"In 1882 I added several new preparations, consisting of toilet cream, dentifrice, lip salve, ointment, porous plasters, catarrh remedy and toilet soap Special machinery for their manufacture was erected in our laboratory at Number 1 West 13th Street, that building being connected with the one containing our offices at 76 Fifth Avenue All the articles above mentioned were made from the product of Pond's Extract, in different forms, and proved very successful with a large trade

"In 1878 we had opened a branch on Great Russell Street, London, opposite Bridges Museum, and there built up a reasonable trade, principally on Pond's Extract We also established an agency with Roberts and Co, of Paris, France We exhibited our preparations at the Paris Exposition, and received a medal The date of that Exposition I have forgotten,² and have no data by which I can recall it I think the present Pond's Extract Company retains the London Branch, at the present day ³

'While in London, I made a contract with the Hotel Syndicate that controlled all the first class hotels in London The contract was as follows The Syndicate to buy from the London Company ten gross of Pond's Extract, of the small size, and pay our regular wholesale price for it They were to place a bottle in each guest's room, charging same to the room When occupied by a guest, it was the duty of the chambermaid to report to the office whether or not the guest had used the bottle If so, it was charged to the guest, and another bottle immediately put in its place We were to place in the 'lifts' of each hotel a large mirror with the words 'Pond's Extract' lettered across its top Other mirrors were to be placed in the reception room and the public rooms on the first floor This would have required an expenditure of ten or eleven thousand dollars For this privilege, for one year, we were to pay the Hotel Syndicate One Thousand Dollars However the Board of Directors of my company refused to sanction my agreement and the contract was not consummated"

FURTHERING PHARMACEUTICAL PUBLICITY * THROUGH THE OPEN OR PARTIALLY OPEN PRESCRIPTION DEPARTMENT

BY W BRUCE PHILIP

In many drug stores the prescription department is tucked away It is out of sight of the customer of the drug store for whom prescriptions are compounded It is a hole into which his prescription disappears as a piece of paper, and presto, comes back from, as a filled bottle, or pill box To the average customer the technique that it goes through is analogous to the one of putting a ten dollar bill into one of

¹ Just what Mr Hurtt meant by the term "Extract," I did not learn J U L

² Probably 1889

³ 1915

* Section on Commercial Interests, A PH A, Washington meeting, 1935

the air cash boxes in a department store, and having it come back turned into silver dollars, nickels and dimes

The only way that pharmacists are going to convince the public that real manipulation and studied procedure, which require skill, is used in compounding prescriptions is to show the processes. The prescription counter that is seen will be interesting and educating.

Personally, I take a decided stand in advocating the partially open prescription department, regardless of the fact that there are a large number of "one man drug stores" in which the pharmacist is often placed at a disadvantage when he is called away from compounding a prescription in order to serve a customer. If he were working at an open prescription department the fact would, of course, become obvious to anyone in the store, that he had left his work at the prescription counter, to wait upon an incoming customer. The interruption of work for the prescription would be noticeable, but why hide it? I do think, however, that pharmacy must do something to keep its professional rating, and that something must be done at once.

In contacting members of Congress, and other legislators, my experience has been that lawmakers are more and more inclined to classify retail drug stores under the category of "merchandising establishments." Legislators in general are reticent, they are not at all willing to enact additional restrictive legislation which is related to laws dealing with professional pharmacy, they hesitate to even consider giving druggists the right of the exclusive sale of drugs.

To open up the prescription departments, or to give the public a glimpse of this part of the store work, will help to stimulate in the public mind the knowledge that the pharmacist is more than just a merchant. *He is a professional man*, but is not thought of as such.

The processes of filtration, percolation and the manufacturing of certain pharmaceuticals may well be displayed with advantage.

In my opinion, the seeing of the actual filling of prescriptions will have a psychological effect upon both the public and the physician.

We should disregard the fallacy that more prescriptions cannot be written than are now being written, because if the public had full confidence in the ability of pharmacists as professional men, or if there was a trust in the retail drug store the public would demand, and the physician would write more prescriptions.

It is the belief of the writer that the open prescription counter would curtail the dispensing of prescriptions by physicians who make a habit of such a practice. I might even add, that people who now buy patent and proprietary medicines might be interested by seeing the art of pharmacy practiced in a drug store, to induce physicians to write prescriptions for pharmacists to compound. Illegible prescriptions or those for other reasons which require study can be read without attracting the patient's attention. There seems to be no logical reason why a part of the prescription department should not be kept out of view of customers, permitting a certain amount of privacy to the pharmacist who is working out a dispensing problem.

One phase of the case is that there are some untidy prescription departments which the dispenser would be ashamed to have the public see. All right, if a partially open prescription department will clean up for druggists who are careless

dispensers and manufacturers the sooner a partially open prescription department is installed the better it will be for every one concerned and interested in pharmacy

The writer recommends that a glass partition be so arranged that conversation in the drug store proper cannot be distinctly heard in the prescription department. In like manner the glass would prevent the carrying of voices in conversation from the prescription counter to customers in the store.

In the final analysis, pharmacy is a profession, and pharmacists should act accordingly. Shall the professional part of the drug store, the prescription department, be limited to a number of professional stores, or to hospitals? No! The plan does not appeal to the writer and it is not the public's idea of good *drug store service*. The public wants and needs *drug stores*.

With all facts considered, the drug store is still a drug store, but there is a need to emphasize it. A partial opening of the prescription department to the public's inspection will emphasize the art of the pharmacist, and will give a solid foundation for the demand for legislation in the public interest. There is a virtue and a need to confine the sale of drugs and medicines to qualified registered pharmacists.

ANNUAL MEETING OF THE BOARDS AND COLLEGES OF PHARMACY, N A B P DISTRICT NO 2

The annual meeting of the Boards and Colleges of Pharmacy, N A B P, District No 2, was held in the American Institute of Pharmacy, March 11th and 12th. The meeting was representative of these bodies and a dinner was given on March 11th to the visiting delegates of the Boards and Colleges under the auspices of the District of Columbia Veteran Druggists' Association, assisted by the D of C Pharmaceutical Association, D of C Board of Pharmacy, the George Washington University School of Pharmacy and Howard University College of Pharmacy.

Dean C Leonard O'Connell was chairman for the Colleges and John M Woodside for the Boards. Reports of the various standing committees were received and discussed. Among the reports were those on examination technique and statistics. Other reports dealt with phases of examinations and experience requirements and on the fate of the pharmacist under socialized medicine.

Other meetings recently held in the American Institute of Pharmacy were those of the Medical Round Table Association and the Chemists Club.

THE TWELFTH INTERNATIONAL PHARMACEUTICAL CONGRESS

Among the subjects that will be considered at the Twelfth International Congress in Brussels are the following: The medico pharmaceutical scope, the limitation of pharmacies, pharmaceutical regulations—control of patent medicines and prices to be charged, management of pharmacies, pharmaceutical service in social insurance, the question of employment in pharmacies, pharmaceutical terms.

AMENDMENT PERMITS RETAIL DRUG CODE AUTHORITY TO INCORPORATE

The National Industrial Recovery Board on March 20th announced approval of an amendment to the code for the retail trade, permitting the code authority for the retail drug trade to incorporate. The amendment applies to the national code authority and to each local committee.

Written assent of the National Industrial Recovery Board must be obtained before any such code authority may incorporate.

THE DEPARTMENT OF THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY

C B JORDAN—CHAIRMAN OF EXECUTIVE COMMITTEE, A A C P, EDITOR OF THIS
DEPARTMENT

The following short paper by Dean Spease presented in his characteristic way contains food for thought by all those who are called upon to teach pharmaceutical arithmetic. As one who has had considerable experience in teaching this subject, I want to say that I am indeed happy that the forthcoming Pharmacopœia will eliminate the difficulties we have had in the past in teaching the subject of "percentage solutions"—C B JORDAN, *Editor*

SOME OBSERVATIONS AFTER TWENTY-FIVE YEARS' EXPERIENCE IN TEACHING PHARMACEUTICAL MATHEMATICS

BY EDWARD SPEASE *

(CONFERENCE OF TEACHERS OF PHARMACY)

I have been asked to say a few words upon my observations of twenty-five years in the teaching of Pharmaceutical Mathematics

This paper will be short even though I might make many observations and it will only be necessary to point out one or two things that are of interest

Back in the days of the two-year course before students were high school graduates I always found it necessary to drill each class over and over again upon the tables of weights and measures before they were ready to begin any form of mathematics. After that they learned methods and principles and what they learned were largely memory feats. To-day this is not true and one lesson upon the metric system, one upon all others, and one upon conversion is sufficient.

Of course, there is continued use which furnishes repetition and that clinches the memory part, but to-day they are able to confront themselves with mental pictures and weights and measures mean something real to them though they are not as proficient in the multiplication tables as in olden times. This is explainable. May I add at this point, always show them a grain of wheat and point out the origin of the grain and that it represents 64.8 mg.

I read the other day that one of our deans found fault with the high schools. After visiting many high schools I cannot lay the blame at their doors. I find high school graduates to-day lacking in experience. They do not have the experience to draw upon that we older folk have who lived upon farms, in villages or had connections with shops and mechanical devices, if only through our friends. To-day they read of them but don't do them. Riding on a street car or in an auto to school does not furnish that rich background of experience. Shop courses provide much of it but not for all students. This observation also includes the fact that things learned in the grades may never recur until the student reaches us in college and for some, never again. How many of you now know your Latin conjugations and declensions, but review them once more and they will stick.

I enjoy the student of to-day and believe he is easier to teach, and especially since I have visited high schools, read teachers' magazines, talked to high school teachers and learned what they are trying to do.

* Dean, Western Reserve University School of Pharmacy, Cleveland, Ohio

The subject of percentage solutions, happily, has been solved by a statement in the British Pharmacopœia and by a similar one to appear in our own next revision Have you read W/W, W/V and V/V of the British Pharmacopœia?

I have only a few more points to mention The first is the ever-present difficulty in teaching the student to apply what he knows He always thinks that percentage or any other matter is different in Pharmacy from what it is elsewhere This is one point at which the teacher's ingenuity is most taxed

I should like to recommend to you never to accept an answer, either in whole or in part that cannot be weighed or measured For instance, one cannot weigh odd fractions, have them expressed in weighable and measurable denominations Our hospital manufacturing laboratory has done much to help us in this regard

One principle I always follow is to make all first class room calculations with the utmost accuracy and then, later, give problems and teach when "round numbers" may be used I tell them an educated person should know when to use judgment, and "round number" factors should not be memorized I have them calculate the variations in dosage of strychnine in five gallons of a preparation by comparing 19 liters with 18 925 liters as the equivalent of 5 gallons

Should we all "jump through the same hoop," and is it wise to have all our colleges of pharmacy placing the same emphasis upon all courses offered? We all agree that each college should have individuality There should, however, be a maximum and minimum beyond which it would not be wise to stray Several times members of the American Association of Colleges of Pharmacy have studied our college catalogs and offered criticisms Your Editor believes that as we develop the four-year course there will be less and less reason for criticism The following study by Dr Burlage is of great interest and his general comments are worthy of careful consideration I am sorry that space will not permit the publication of the chart that accompanies Dr Burlage's paper The faculty of every college of pharmacy should be interested in this study because it gives an opportunity to determine whether their institution is much out of line in the time devoted to and content of the curriculum —C B JORDAN, *Editor*

A COMPARISON OF THE FOUR-YEAR CURRICULA IN PHARMACEUTICAL SUBJECTS

BY HENRY M BURLAGE *

Beginning with the academic year 1932-1933, the member colleges of this Association entered upon a new phase of educational endeavor with the elimination of all short courses in Pharmacy by requiring the completion of four years of college training before a degree in Pharmacy might be obtained As we all know this necessary advancement was attained only after years of struggle and effort on the part of educational leaders in pharmaceutical instruction with the hopes that this profession might be put on a higher plane than it has occupied in the past The writer feels that such hopes cannot be fully realized unless a critical examination of the individual courses making up the new curricula is resorted to with the purposes of bringing about unification of such courses, the elimination of repetitions and obsolete material and a modernization of the same

Unfortunately the fourth edition of the Pharmaceutical Syllabus, representing

* Professor of Pharmacy, School of Pharmacy, University of North Carolina

the composite efforts of 21 individuals interested in pharmaceutical affairs and 30 or more teachers recognized in their respective fields, was not released until January 1932 and was, therefore, not available for study in the unification of course instruction

In order to make a critical examination of the courses in so-called Theoretical and Operative Pharmacy which he offers, the writer decided to study the curricula of the various colleges of the Association to ascertain the position of Pharmacy in these curricula as to time, course content and compare these courses with those outlined in the Syllabus. Accordingly the catalogs for the session 1933-1934 of the member colleges were studied and the results to the best of the author's ability are tabulated in the accompanying table

This study revealed such non-uniformities that it was deemed advisable to present these findings to the Conference of the Teachers of Pharmacy, to show the need of a critical survey of these Pharmacy courses as to content, time, year offered, etc., with the hope that this Conference might make some definite recommendations to the Association in order to bring about a greater uniformity of catalogs, valuations of didactic and laboratory hours, etc

Arithmetic of Pharmacy (Syllabus Requirement (Lectures) $32 + 0 = 32$)—Forty-five of 52 curricula offer this subject under the above title or similar titles. There is a probability, however, that this subject matter might be offered in other courses. It is unfortunate that it is necessary for this to be listed in a four-year course. It appears that such a course is necessary since students are so poorly prepared in the fundamentals of arithmetic and algebra that they cannot handle the problems pertaining to pharmacy. The writer feels that the essential work in this subject can be offered without much difficulty in other beginning courses in Pharmacy of a more dignified title. It is pleasing to note that the majority of the schools offer in the Freshman year, only the Syllabus requirement

Dispensing (including Incompatibilities) (Syllabus Requirement (Lectures) $64 +$ (Laboratory) $128 = 192$)—Practically all of the schools offer courses under this heading, a few, however, list Dispensing under Manufacturing Pharmacy, some offering an unusually large number of hours of Dispensing, probably including other course material. A majority of the schools offer the hours suggested by the Syllabus, or more, 19 schools as far as could be ascertained offer less than the Syllabus requirement in hours. It appears that any school offering less than 192 hours is neglecting an important phase of Pharmaceutical education and that even more than this amount might be desirable. This subject has no place in the curriculum before the Junior year, the survey shows that a majority offer it in the Senior year

History of Pharmacy (Syllabus Requirement (Lectures) $32 + 0 = 32$)—Twenty-eight schools offer this course, which might be developed to be of great value in raising the professional morale, some, no doubt, include the subject matter in other courses. A majority offer 32 hours chiefly in the Freshman year. The proper time to offer this material is subject to discussion

Pharmaceutical Jurisprudence (Syllabus Requirement (Lectures) $32 + 0 = 32$)—Thirty-three schools offer this material in courses ranging from 11-96 hours, 14 offer the Syllabus requirement, 20 offer the course in the Senior year. It seems appropriate to offer this course only in the Senior year devoting *not more* than 32 hours, also rather than provide for another course of low credit hours, this material might well be covered in a course in Dispensing or Commercial Pharmacy

Latin of Pharmacy (Syllabus Requirement (Lectures) $32 + 0 = 32$)—With many students offering several years of Latin as entrance credit, this subject in the writer's opinion is over-emphasized and the necessary instruction might be introduced in beginning Pharmacy courses and later in Dispensing when the prescription is studied. Hours range from 16-48 with 22 curricula out of 27 offering 32 hours. It seems appropriate to offer this work in the Freshman year and a majority recognize this fact

Manufacturing Pharmacy (Syllabus Requirement—Optional— + (Laboratory) $96 = 96$)—Twelve catalogs offer courses under this title with hours varying from 80-192 in the Junior or

Senior years, lecture work is offered in most cases. There seems to be some confusion as to the content of the course. According to the Syllabus, Manufacturing Pharmacy is "quantity production of pharmaceuticals," or production on a semi-commercial scale and does not mean the preparation of pharmaceuticals in small quantities.

Following Manufacturing Pharmacy, the Syllabus lists in order, Operative Pharmacy ((lectures) 64 + (laboratory) 128 = 192), Pharmaceutical Technique (0 + (laboratory) 64 = 64) and Theory of Pharmacy ((lectures) 192 + 0 = 192) totaling $256 + 192 = 448$ hours. The subjects are outlined to include subject matter of the greatest basic and fundamental importance in pharmaceutical training and should receive the greatest study and attention of teachers of Pharmacy. These subjects, no doubt, as outlined in the Syllabus, have and will receive criticism as to content, time allotment, etc. It is unfortunate that these sections were not divided more strictly, stating a time requirement for the various subdivisions, thus avoiding a certain amount of confusion that is evident in a study of the curricula of the schools. This condition has made the tabulation of these vital subjects difficult. In order to simplify this task somewhat the following subdivisions of the three subjects of the Syllabus are adhered to: Pharmaceutical Technique, Galenical Pharmacy, Pharmacy of Inorganic Chemicals, Pharmacy of Organic Chemicals (including New and Non official Remedies).

Pharmaceutical Technique—Fifty one schools offer this subject matter under the above or similar titles with hours varying from 32–320, those offering a large number of hours, however also include other subject matter. Thirty four offer the work in the Freshman year, 13 in the Sophomore year, 3 in both years, in most cases lecture work accompanies the laboratory work. It appears that the course in catalogs should be more clearly defined. From the writer's experience, a satisfactory division of hours appears to be ((lectures) 48 + (laboratory) 64 = 112), offered as a Freshman or early Sophomore subject employing in the laboratory work official examples of the processes wherever possible.

Galenical Pharmacy—While many individuals object to this title, the writer feels it to be distinctly pharmaceutical, indicating a phase of the so called Operative Pharmacy involving the classes of the official preparations and their manufacture especially those which do not involve chemical reactions. This phase of the work should be regarded by the teacher of Pharmacy as one of the most important of pharmaceutical training. In no other course can the theories of the basic courses be so applied as to develop technique, professional pride and interest. Under no conditions should it be neglected in organization and time.

Fifty catalogs list courses which are distinctly galenical pharmacy, in some cases, technique, inorganic pharmacy, manufacturing and commercial pharmacy are also included. Clock hours vary extremely from 53–544, the subject matter is offered in the majority of cases in the Sophomore year but the spread extends from the Freshman to the Senior years. It appears that a course of 160 hours ((lectures) 64 + (laboratory) 32 = 96) offered not earlier than the Sophomore or Junior year is satisfactory and desirable.

Pharmacy of Inorganic Chemicals (Inorganic Pharmacy)—A course with one or the other of these titles is subject to much controversy as some individuals feel that this material falls in the realm of so called Inorganic Pharmaceutical Chemistry or that it is adequately covered in basic Chemistry courses. To a certain degree the writer concurs with these opinions. A course seems highly desirable which deals with the official inorganic compounds studying them from the angle of their periodic classification accompanied by laboratory exercises performing the necessary tests and preparing and studying the official preparations involving chemical reactions of these inorganic substances.

Twenty-nine schools offer courses which might be construed to include this course material with a wide variation of hours offered chiefly in the Sophomore and Junior years. A course of 80–96 clock hours ((lectures) 32 + (laboratory) 48 = 80) or ((lectures) 32 + (laboratory) 64 = 96) offered in the Sophomore year seems desirable.

Pharmacy of the Organic Chemicals (Organic Pharmacy)—Such a course is also subject to discussion especially as to course content since it might be included in so called Organic Pharmaceutical Chemistry. The writer does not agree with these contentions especially if the Pharmaceutical Chemistry courses are of a basic nature since the fundamentals of organic chemistry can not be stressed and at the same time a study of the official organic compounds be made, some knowledge of the more complex substances of natural origin and especially the ethical new and

non official remedies which are becoming more and more important should be stressed A course of 48-80 hours ((lectures) $48 + 0 = 48$) to (lectures) $48 +$ (laboratory) $32 = 80$) offered in the Senior year would be especially valuable

Commercial Pharmacy—Thirty-four catalogs listed courses which vary greatly in hours and offered chiefly in the Junior or Senior years such courses are not offered by some schools since the commercial subjects are offered in service departments as Economics and Commerce

GENERAL COMMENTS

1 Of the 54 catalogs studied, 53 offer curricula for the four-year course
2 Eleven of the 54 colleges are on a quarter basis
3 The curricula of 11 schools offer too many courses of small credit evaluation This weakness can in part be corrected by uniting the didactic course with the laboratory course in the same subject, rather than offering two courses This has been an outstanding weakness of Pharmaceutical curricula for years and presents a condition which is open to much criticism by educators A course requiring only one lecture hour a week should be increased in credit value or incorporated with a suitable major subject where it might be treated appropriately

4 Four curricula offer Seminar courses which is of questionable value for under-graduates unless they have unusual ability

5 Five institutions offer Assaying in pharmacy courses This instruction seemingly and more properly should be offered in Quantitative Pharmaceutical Chemistry

6 Considerable variation as to the number of laboratory hours equivalent to 1 credit hour is apparent Nine curricula listed laboratory courses with no credit for this work to 1, 2, 3 and 4 clock hours equivalent to 1 credit hour

7 Three colleges offer courses in the Use of the Library and Literature, such subject matter might well be offered in History of Pharmacy

8 A course entitled Research and Thesis offered by 3 schools is of a commendable type but it appears that it should be offered as an elective only to those undergraduates who possess unusual investigative ability

9 Pharmacy courses are distributed throughout the four years by most of the institutions with the following exceptions one school with no work in the Junior year, two with none in the Senior year, and six with no work in the Freshman year

10 Twenty-three curricula list one or more courses which to all appearances are review courses preparatory to the State Board Examinations Such review seemed advisable when 2- and 3-year curricula were offered but in the new curriculum seems unnecessary with the additional time allowed and if the courses offered are of such a calibre and so distributed as to allow more intensive and thorough study The time consumed by review courses might well be devoted to courses elective for the purpose of broadening the training of the student

11 Curriculum Outlined and Course Descriptions

- (a) In 9 catalogs didactic and laboratory hours not stated in whole or part
- (b) Eleven offer vague or confusing course descriptions and outlines, 5 of which were difficult to study intelligently
- (c) Two outlines of study with no course numbers
- (d) One with credits poorly defined
- (e) Credits in 2 curricula outlines did not correspond with those in the course description

PROCEEDINGS OF THE LOCAL BRANCHES

"All papers presented to the Association and Branches shall become the property of the Association with the understanding that they are not to be published in any other publication prior to their publication in those of the Association, except with the consent of the Council"
—Part of Chapter VI, Article VI of the By-Laws

ARTICLE III of Chapter VII reads "The objects and aims of local branches of this Association shall be the same as set forth in ARTICLE I of the Constitution of this body, *and the acts of local branches shall in no way commit or bind this Association, and can only serve as recommendations to it* And no local branch shall enact any article of Constitution or By-Law to conflict with the Constitution or By-Laws of this Association "

ARTICLE IV of Chapter VII reads "Each local branch having not less than 50 dues paid members of the Association, holding not less than six meetings annually with an attendance of not less than 9 members at each meeting, and the proceedings of which shall have been submitted to the JOURNAL for publication, may elect one representative to the House of Delegates "

Reports of the meeting of the Local Branches shall be mailed to the Editor on the day following the meeting, if possible Minutes should be typewritten with wide spaces between the lines Care should be taken to give proper names correctly and manuscript should be signed by the reporter

BALTIMORE

The February meeting of the Baltimore Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held at the Hotel Emerson on Monday, February 18 1935 President Wm F Reindollar presided

The speaker of the evening was Dr J Leon Lascoff¹ of New York City, who discussed methods of compounding difficult prescriptions and gave demonstrations The title of his paper was—'It Can Be Done'—the paper follows

IT CAN BE DONE III

The author stated that this was the third paper of the series, the first was presented at the Baltimore meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION, and the second before the Massachusetts Pharmaceutical Association

The prescriptions discussed in this paper are representative of those received in the 'Lascoff Pharmacy,' some are brought in by pharmacists to be compounded for them, on others advice was asked by phone and otherwise

Requests are received daily from pharmacists asking for advice in dispensing Quite often, the reason for this is due to the fact that the patient has brought in a copy of the prescription from another pharmacy The one who originally compounded the prescription may have dispensed a clear solution or a homogeneous mixture The next dispenser may have produced a cloudy mixture, or one so unsavory that the patient probably felt that he would be benefited more by not taking it than by following the directions on the label

Such differences in results of dispensing often lead physicians to prescribe proprietaries It is not difficult to understand why, the physician is certain, to a degree, that when he prescribes a proprietary that he will obtain a mixture containing equally divided doses, having a pleasant taste, a good color and a uniformity of appearance no matter where it is dispensed

The New York State Pharmaceutical Association has appointed a U S P and N F Propaganda Committee which has sponsored meetings of physicians and pharmacists At these gatherings the physicians have been asked why they did not prescribe U S P and N F preparations more frequently The gist of their complaints was the lack of uniformity in dispensing and the fact that they could not obtain satisfactory preparations of the same medication from different pharmacists

It was pointed out, of course, that if the patient read the prescription, and discovered that the medicine was a proprietary which could be purchased practically anywhere, it was very apt to

¹ Chairman, Committee on Recipe Book

lead to self-medication Most physicians are willing to prescribe official preparations if they can do so with the assurance that their patients will receive uniform, palatable preparations

Physicians are visited daily by detail men from the pharmaceutical manufacturing houses Usually samples of proprietaries and the "Pharmacopœia" of the manufacturer are left with the physicians The question arises, "Why does not the Pharmacist do his own detail work?" There are many practical methods of doing this, and the results are really worth while

If all pharmacists belonged to, and supported the state and national pharmaceutical associations, effective propaganda could be carried on, the purpose of which would be to acquaint physicians with the merits of official preparations and the advisability of prescribing them

Unfortunately, many pharmacists have no desire to develop their prescription practice, they consider it a "necessary evil" They prefer selling some article which merely requires wrapping up, they consider that this type of business is easier to handle, requires less work, involves no responsibility and the profits are greater But prescription business is worth while, and statistics prove it

Quoting Dr Robert L Swain, in a recent issue of *Drug Topics*

"Statistics reveal that retail pharmacists compound annually more than 250,000,000 prescriptions Each of these represents a contribution to the health and physical welfare of the general public This impressive record establishes the pharmacist as a health officer whose profession is vitally affected by the public interest"

Mind you, 250,000,000 prescriptions are compounded in the course of one year! This figure offers a very obvious answer to the question, "Is prescription business worth while?"

For years the separation of the pharmacy from the drug store has been advocated by the speaker—the professional pharmacy should not be submerged by side lines, and sandwich counters, and it is interesting to note that for the past few years there has been a definite movement toward professionalism in pharmacy Many pharmacists who had luncheonettes which practically obscured their prescription counters have discarded the lunchrooms and are featuring prescription departments instead

In the writer's observations of these changes he has noticed three types of Prescription Departments for which improvements might be suggested

- 1 The type which is entirely enclosed, which is tucked into a very small space in the pharmacy, and bears a "No Admittance" sign

- 2 The type having a partition so high that persons on the outside can see only the ceiling of the prescription room

- 3 The type having the entire prescription room open to the view of the public Everything the pharmacist does is seen by the customer This is not always advisable

The writer does not approve of prescription rooms which are too open nor of those which are entirely closed There should be a happy medium—neither completely closed nor entirely open The dividing partition between the prescription room and other section of the pharmacy should be high enough for a person to see the head of the pharmacist at work but not his hands The patient should not see when a label is washed off a bottle or when pills are transferred from an original package to a box, in order to affix directions

In the average store the size of the Prescription Department should be about one-third that of the entire store The counters of the department should be made of "white glass" This is very easily kept clean and presents a very attractive appearance to the laity who observe, it also makes a good impression on physicians who are enthusiastic about cleanliness

Needless to say it is not enough to just install an attractive prescription room, pharmacists cannot stop at this point—they must make their departments pay

There are many methods which can be used to increase the volume of the prescription business

Detailing the neighborhood physicians advisable—Let the physician know that you are equipped to help him solve his prescription problems Impress him with the idea that you can do something for him Interest him enough so that he will visit your pharmacy and your prescription department But be sure that you have something worth showing, so that the physician will not feel that his time has been wasted

Keep the public advised of the fact that yours is a professional pharmacy Advertising in

the local papers and journals is an effective method of doing this Well arranged, professional windows usually attract attention and create a lasting impression

In dispensing, use neat boxes, labels and wrapping materials Everything that leaves the pharmacy must be in tip top order Use only those ingredients manufactured by reputable concerns

In the writer's opinion a successful prescription pharmacy cannot be run by one man alone a prescription should be compounded without interruptions This is not possible when one man attempts to take care of both the counter trade and the compounding " The pharmacist should be able to carefully read over the prescription noting the doses, and the incompatibilities if any are present Under no circumstances should he be that type of pharmacist who continually abuses the Shake Label " If he is in doubt about any of the ingredients in a prescription or about the doses he should consult the physician or reference books Those prescriptions which present compounding difficulties should be studied with care Many mixtures from which it is, at first glance, seemingly impossible to make a palatable, homogeneous preparation can be properly made and dispensed with the exercise of due thought and care

The prescriptions which follow are samples of those which have troubled many pharmacists Correct compounding procedures have converted them from disagreeable looking unsatisfactory products, to preparations which are proper and correct for administration as medicine

R̄ 1	Ichthyol	4 0
	Calamine	8 0
	Zinc Stearate	2 0
	Lime Water q s	120 0

In compounding this prescription, as written, the zinc stearate will float at the top of the mixture Neither acacia nor tragacanth will help in obtaining a smooth mixture The only remedy is to add glycerin to the zinc stearate, rubbing well Add the calamine Add the ichthyol previously dissolved in a small quantity of water Finally add lime water enough to make 120 cc

R̄ 2	Potassium Iodide	5 I
	Salicylic Acid	5 II
	Sodium Bicarbonate	5 II
	Tincture of Colchicum Seed	5 III
	Aromatic Elixir	
	Compound Syrup of Sarsaparilla of each q s	f 5 III

This prescription does not contain sufficient sodium bicarbonate to neutralize the salicylic acid It is necessary to add 2 drachms of sodium bicarbonate to the salicylic acid with the aromatic elixir When the reaction has taken place, filter out the excess sodium bicarbonate and add the other ingredients The resulting solution is clear without any sediment or precipitation

R̄ 3	Ammoniated Mercury	2 0
	Acid Salicylic	3 0
	Phenol	0 5
	Alcohol*	15 0
	Soft Soap	10 0
	Rose Water q s	90 0

The pharmacist who presented this prescription complained that after compounding a heavy lumpy precipitate formed which greatly resembled a sponge No matter how he attempted to fill this prescription, he did not get a satisfactory preparation The method used in the preparation shown, was to rub up the ammoniated mercury and the salicylic acid to a very fine uniform powder Add the rose water, triturating well until a smooth paste is formed Add the soft soap and lastly the phenol

* The alcohol was omitted because this seemed to cause all of the trouble

℞ 4	Zinc Sulphate	gr I
	Boric Acid	gr V
	Sodium Borate	gr IV
	Rose Water q s	fl oz I

This prescription is intended as an eye prescription and if compounded as written will form a zinc borate compound which is insoluble. The addition of Price's Glycerin does not dissolve the precipitate sufficiently to enable it to be used in the eyes. The only other alternative is to filter, which was done.

℞ 5	Betanaphthol	ʒI
	Asafetida	ʒII
	Syrup	fʒII
	Elixir of Three Bromides q s	fʒIII

The pharmacist telephoned in this difficult prescription and informed us that he had tried making an emulsion using acacia to emulsify the asafetida. He evidently did not remember that there is an official Emulsion of Asafetida, which does not employ acacia or tragacanth. We rubbed up the asafetida to a very fine powder and then adding water very little at a time formed an emulsion. To this add the betanaphthol previously rubbed up with the elixir of three bromides and add the syrup. This mixture was strained through cotton. The result is a homogeneous mixture without any separation.

℞ 6	Morphine Sulphate	gr II
	Potassium Iodide	gr C
	Tincture of Belladonna	ʒII
	Peppermint Water q s	fʒIII

When compounded, a precipitation of morphine alkaloid takes place due to the action of the potassium iodide on the alkaloidal salt, morphine sulphate. There is not enough alcohol in the tincture of belladonna to keep the morphine alkaloid in solution, therefore it is necessary to add about three drachms of alcohol, which will dissolve the precipitate.

℞ 7	Cinnabar	4 0
	Precipitated Sulphur	4 0
	Water q s	120 0

This prescription presented a very messy appearance when compounded as written. The cinnabar stuck to the sides of the bottle and could not be shaken into a uniform mixture. It is not necessary to use acacia or tragacanth. In preparing this prescription, we rubbed up the cinnabar with half an ounce of glycerin and added to this the precipitated sulphur. Finally, the water was added, forming a fine uniform homogeneous mixture without any messy separation.

℞ 8	Fluidextract of Cannabis	ʒIss
	Ammonium Chloride	ʒIII
	Syrup of Hydriodic Acid q s	fʒIV

The resins of cannabis will be precipitated out by the syrup, therefore, it will be necessary to add an equal amount of acacia to the cannabis. Dissolve the ammonium chloride in about three drachms of water. To this add the syrup of hydriodic acid and add gradually to the fluid-extract of cannabis and acacia. The resulting mixture does not contain any precipitation and is a uniform mixture, suitable for dispensing.

℞ 9	Lead Acetate	4 5
	Precipitated Sulphur	4 5
	Glycerin	4 5
	Water q s	90 0

In this prescription the sulphur will separate out and a uniform mixture cannot be obtained if compounded as written. It is necessary, therefore, to rub up the sulphur with a drachm of tragacanth, to which glycerin was added. Dissolve the lead acetate in water and add to the sulphur mixture. Finally add enough water to make the ninety cc. This mixture, when shaken, is presentable and can very well be dispensed without fear of the sulphur separation taking place.

R̄ 10 Sodium Borate	9 0
Oil of Gaultheria	3 6
Liniment of Soft Soap <i>q s</i>	120 0

We compounded this prescription as written and noted after a while that there were large pieces of floating borax (presumably). This was also evidenced when the lotion was rubbed on the hand. It was very gritty. To remedy this, we dissolved the sodium borate in a small quantity of hot water and rubbed this up with soft soap. Next we added the oil of gaultheria and the liniment of soft soap, enough to make 120 cc.

R̄ 11 Sodium Bromide	5 III
Ammonium Bromide	5 III
Elix of Iron, Quinine and Strychnine	
Phosphate <i>q s</i>	℥5 III

The elixir is not very stable and is incompatible with a large number of other ingredients. In this prescription it is advisable to use the Elixir of Iron Quinine and Strychnine Citrate. The solution would then be clear without any separation or precipitation.

R̄ 12 Potassium Chlorate	8 0
Tincture of Myrrh	12 0
Distilled Water <i>q s</i>	120 0

This is intended as a gargle but could not be used if compounded as written. There is a separation of the constituents of the tincture of myrrh when added to the water. To overcome this, we rubbed up the tincture of myrrh with one drachm of powdered acacia. Separately we dissolved the potassium chlorate in some water and added to the myrrh and acacia. Finally enough water was added to make the 120 cc. The final mixture is homogeneous without any separation.

R̄ 13 Strontium Bromide	12 0
Ammonium Carbonate	8 0
Syrup of Tolu	30 0
Water <i>q s</i>	90 0

The difficulty in this prescription lies in the fact that the strontium bromide is incompatible with alkalis. Therefore, it is necessary to use ammonium bromide in place of the strontium bromide when a very nice clear solution results.

R̄ 14 Phenobarbital	0 5
Sodium Bromide	4 0
Elixir Pyramidon	45 0
Water <i>q s</i>	60 0

When compounded we noticed a precipitate of fine crystals which probably is the phenobarbital. Instead of using phenobarbital, we used the soluble phenobarbital, namely—Phenobarbital Sodium. We dissolved this together with the sodium bromide in water and added the elixir pyramidon. There is not sufficient alcohol in the elixir to precipitate out the phenobarbital sodium.

R̄ 15 Menthol	0 06
Camphor	0 06
Mercurochrome	0 12
Olive Oil	60 00

The mercurochrome is not soluble in the olive oil, therefore, it is necessary to dissolve the mercurochrome in a few drops of water. Pick up this solution with a small quantity of Aquaphor. To this gradually add the olive oil. In another mortar triturate the menthol and camphor together until they liquefy. Add some of the olive oil to this. Finally, mix both solutions and add enough of the oil to make the two ounces. The resulting mixture does not have any separation of the mercurochrome and is perfectly uniform.

R̄ 16	Arsenic Trioxide	0 06
	Extract of Nux Vomica	2 00
	Quinine Sulphate	0 60
	Peppermint Water q s	240 00

None of the powder ingredients are soluble in water, therefore, if compounded as written, the patient may very easily take an overdose. In preparing this prescription, we used 100 minims of the Liquor Acidi Arsenosi which is 1% arsenic trioxide. Also, instead of using the insoluble quinine sulphate, we could use the soluble quinine bisulphate. Dissolve the extract of nux vomica in some diluted alcohol. Add all of the solutions and then add sufficient peppermint water to make 240 cc. You will note, in the finished product, that there is no precipitation and that the solution is perfectly clear.

R̄ 17	Camphor	4 00
	Salicylic Acid	0 66
	Precipitated Sulphur	6 50
	Lime Water q s	120 00

When compounding this prescription as written, we noticed a complete separation of the insoluble material. To properly compound this we dissolved the camphor and salicylic acid in a small quantity of alcohol. Rub up the sulphur with about a drachm of tragacanth, adding the lime water. Finally mix the camphor solution to the sulphur and add enough lime water to make 120 cc.

R̄ 18	Phenol	1 0
	Tincture of Iodine	1 0
	Mucilage of Acacia	4 0
	Alcohol	20 0

When compounded as written, a stringy precipitate results which is due to the incompatibility of the alcohol with the acacia. Therefore, in order to dispense a presentable solution we can leave out the troublesome mucilage of acacia and the result will be a clear solution.

R̄ 19	Iodine	gr I
	Ephedrine Alkaloid	gr V
	Menthol	gr III
	Camphor	gr III
	Liquid Petrolatum q s	f 5 I

When the pharmacist compounded this prescription, he noted that upon the addition of the ephedrine alkaloid, the solution turned a murky brown and after a day, decolorized completely. This was due of course to the action of the alkaloid on the iodine. We compounded this prescription by rubbing up the camphor and menthol until liquid, then added the iodine and a small amount of petrolatum and rubbed until the iodine dissolved. Using ephedrine sulphate instead of the alkaloid we dissolved this in a small quantity of water and picked it up with aid of Aquaphor. To the ephedrine mixture, we added slowly the liquid petrolatum. Next we added the camphor menthol iodine solution. You will note that the finished product has kept its color and odor of iodine.

R̄ 20	Bimodide of Mercury		gr Iss
	Tincture of Iodine	} of each	
	Potassium Iodide		5II
	Syrup of Ferrous Iodide		5II
	Aromatic Elixir		f5II

R 21	Magnesium Oxide	3II
	Bismuth Subcarbonate	3I
	Sodium Bicarbonate	3III
	Calcium Carbonate	5II
	Water q s	15IV

This prescription, after standing for a very short time, became very hard and could not be removed from the bottle. When we compounded this, we added to the powders half an ounce of glycerin and this served to keep the powders in sufficient suspension to be dispensed.

CAPSULES

Recently, the manufacturers have been detailing the physicians on capsules, instead of tablets and pills. This is because of the fact that the physicians are not prescribing ready made pills—they prefer to have the pills freshly made.

The manufacturers are selling such items as Iron and Ammonium Citrate capsules, Digitalis capsules, etc. The cost to the pharmacist is a great deal more than if he were to prepare these himself.

It is not too difficult for any pharmacist to prepare any number of quindine capsules.

In connection with quindine, it was called to the writer's attention, the other day, that a physician wrote for "Quinoidine" and the pharmacist dispensed quindine. Evidently the pharmacist did not trouble to look in his reference books to see if there was such an item as "Quinoidine" or he misread it as "Quindine."

R 23	Quinoidine Capsules	gr V
R 24	Quindine Capsules	gr V
	Iron and Ammonium Citrate Capsules	0 5

SUPPOSITORIES

R 25	Chloral Hydrate	gr X
	Make 12 suppositories	

The pharmacist endeavored to prepare these suppositories but found that they melted while he was working.

In conclusion the author expressed the hope that the demonstrations had been of interest, and that some of the suggestions offered may prove of value. He said that to him Pharmacy is not just a business, he found it an interesting, and absorbing profession, as well as a hobby. He expressed his appreciation of the efforts in his behalf and thanked the members.

An informal dinner was given for the guest of honor which was attended by members of the Baltimore Branch.

Prof E N Gathercoal,¹ of Chicago, was present and commented on the paper. A general discussion was entered into regarding the prescriptions considered by the author. A rising vote of thanks was tendered the latter for his excellent paper.

About forty members attended the meeting.

C JELEFF CARR *Secretary Treasurer*

CHICAGO

The monthly meeting of the Chicago branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held February 19th, at the University of Illinois College of Pharmacy.

The speaker of the evening was E E Swanson, of the Eli Lilly Research Laboratories, who discussed "Physiological Testing."

An introduction to the discussion was made by mentioning the purpose and uses of bioassays. Bio assay, or physiological testing is used where the chemistry of the drug is not definitely known and where a reliable basis of standardization is needed. With some of the drugs that are bio assayed there are cases where there are more than one active constituent.

¹ Chairman, Committee on National Formulary

The speaker cited a cardiac stimulant as an example of bio assay. These drugs are assayed on the frog or cat. In large production work accuracy of the tests is accomplished by a definite system of procedure. Digitals, for example, comes to the manufacturing house in carload lots. The crude drug is assayed biologically and must assay at least 10 per cent above the U S P standards. The crude drug is passed if it is satisfactory. Then the various preparations of the drug are returned for further testing.

Mr Swanson stated that his tests showed the U S P frog method and Hatcher Cat method to give about the same results, but preferred the frog method inasmuch as the cat method would involve the use of about sixty cats per week in the large laboratories.

Aconite was discussed and it was stated that the physiological test for strength was much more accurate than the chemical test, especially after the preparation of the drug has stood for some time. Hydrogen ion concentration control was mentioned as a means of preventing deterioration.

A discussion of the assay work on ergot, insulin and pituitary extract was made.

Following the discussion lantern slides were shown to demonstrate many of the points that Mr Swanson had discussed.

LAWRENCE TEMPLETON, *Secretary*

NEW YORK

The February 1935 meeting of the New York Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held in the building of the College of Pharmacy, Columbia University, on the evening of February 11th. About sixty members and their guests attended.

President C W Ballard was in the chair and called upon the secretary for his report. This was read and accepted.

Chairman R S Lehman of the Committee on Education and Legislation presented his report as follows:

National Legislation—The new alcohol regulations are out—druggists may buy alcohol in larger quantities than one gallon according to bulletin No 170 of the F A C A, dated January 22, 1935. This bulletin defines the Industrial Uses of Alcohol as follows:

Use of Alcohol and other distilled spirits or wine in the manufacture of medicinal, pharmaceutical or antiseptic products including prescriptions compounded by retail druggists, of toilet products, of flavoring extracts, syrups or of food products or of scientific chemical, mechanical or industrial products, provided such products are unfit for beverage use.

Congress has before it 6000 bills, many of them pertaining to the problems of the retail druggists. Among them three food and drug bills, viz Copeland S 1944, McCarran S 580 also Hoge, H R 3972. No public hearings have been arranged thus far on any of the measures introduced as substitutes for or amendments to the Federal Food and Drugs Act, as the Committees on Interstate and Foreign Commerce will be busy with a number of other important matters.¹ Senator Copeland is seriously considering the amendment of his own bill as to the multiple seizure provision. If so, revised multiple seizures will be dispensed with in misbranded articles. W G Campbell, director of the Food and Drugs Administration favors the Copeland bill as covering all points to the satisfaction of both sides.

Senator Copeland recently introduced a bill, permitting the sale of drugs, medicines and other products for the prevention of conception by doctors and druggists, but prohibiting the advertising of such items.

Congressman Treadway of New York introduced H R 1424, calling a 2½% general sales tax. The administration does not support this measure at present, however, if passed it would realize about twenty million dollars on drug store items alone.

The Federal Trade Commission recently recommended the amendment of Section two of the Clayton Act making it unlawful to discriminate between purchasers unfairly or unjustly, in other words forbidding quantity discounts, and allowing the small buyer to purchase goods at the same price as the large distributor. A bill introduced by Sen Wheeler of Montana, S 944 covers this. It is favored by the N A R D.

The hearing on the Price Fixing provisions of the NRA Codes was held on January 12, 1935. Eighty speakers were heard. All those representing industries were agreed that selling

¹ Hearings were held March 2nd and 8th.

below cost was one of the worst features of the depression. Chairman Williams of the NRA recommends the extension of the NRA in its present form for one to two years more. President Roosevelt is expected to indicate his desires in that respect to Congress shortly.¹

The N A R D is making propaganda for a National First Aid Week, in which the necessity of knowing first aid methods and having the materials on hand is impressed on the public. How this will work out in larger communities, where hospital facilities are convenient, and where, as in New York, the rendering of first aid by a pharmacist is more or less frowned upon by the medical profession as practicing medicine illegally is a question.

State Legislation—The New York State Board of Pharmacy has issued a bulletin publishing its interpretation of the two Dunkel bills recently passed by the Legislature (1934).

It forbids the sale by non pharmacists of a large number of popular proprietaries. These must be sold in a licensed pharmacy or drug store, by a licensed pharmacist or druggists or under their supervision.

"Group I, eleven items containing acetanilid, acetphenetidine, etc., including various headache powders, effervescent analgesics, etc.

"Group II, twenty nine items containing poisonous ingredients such as strychnine, arsenic, morphine, etc., and would bar a number of cough medicines and pills similar to Iron Quinine and Strychnine, or Alcin, Belladonna and Strychnine, etc.

"Group III, ten items in the so-called Habit Forming Group, such containing Barbituric Acid derivatives, etc.

"Group IV, eighteen items of various proprietaries which contain such potent ingredients as thyroids, ergot, cinchophen belladonna, etc.

"The New York State Pharmaceutical Association through its Committee on Legislation is sponsoring a bill in the State Legislature, this session. A Fair Trade Bill (same as the junior Capper Kelly Bill now a law in California). The California law has worked to great satisfaction in California. Same is indicated by the graphs recently set up by the *Druggists Circular* in New York showing sales in California at no profit being only 2½ per cent of the total in drug stores, while in New York City they represent nearly 33½ per cent of the total sales.

"An attempt will also be made to amend the Pharmacy Law defining unethical or unprofessional conduct, and to make them cause for revocation of Pharmacists License."

Following Chairman Lehman's report President Ballard called upon Chairman Steger of the Progress of Pharmacy Committee for his report, it follows:

In the February 1935 No. of *Industrial & Engineering Chemistry*, Dr. Oser of the Food Research Laboratories of New York City criticizes the Interim Revision of Text for U S P Cod Liver Oil.

The critique is concerned chiefly with the new procedures for biological assay, but the author also objects to the definition and the tests for identity and purity, and to the fact that the only ingredients whose addition to Cod Liver Oil is sanctioned are certain flavoring substances and antioxidants being excluded. He states that, among the tests for identity and purity, methods are conspicuously lacking for determination of sophistication by addition of highly potent vitamins containing substances such as halibut liver oil or viosterol.

Chairman E. Fullerton Cook replies for the committee, stating that the text is a necessary compromise. He points out that the text applies only to interim revision and that the new Pharmacopœia will appear shortly. In regard to antioxidants, he states that the committee declines to accept responsibility for permissive use of such substances on which so little information is available, particularly with regard to physiological action, and also defends the procedure of the biological assay. Chairman Cook says, "The committee accepts the compliment implied by Oser in suggesting that it provide methods for the detection of sophistication but is forced to admit that it is not in a better position to supply such a method than is the critic."

The January 1935 issue of the *JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION* makes announcement of Interim Revision No. 3, a new Ergot Assay. It will become official and enforceable, May 1, 1935.

M. F. Lauro in *Oil & Soap* (Vol. 11, No. 12 (1934)) discusses adulteration of Olive Oil. He states that 10-20% of other oils can be mixed with olive oil before any change occurs in the

¹ He has reported

constituent limits, which gives evidence of adulteration. In his opinion, present analytical values should be revised.

Caro and Giam in *Zeitschrift für Physiologische Chemie* (1934) found that tissue extracts inhibit oxidation of ascorbic acid (Vitamin C) which is easily oxidized by atmospheric oxygen. Ringer solution and its most important salt constituents in 0.1-M concentration are likewise inhibitory.

Parsons in *Proceedings of the Royal Society of Medicine* (1934) reports that a case of infantile scurvy was cured by the use of ascorbic acid. This is believed to be the first cure so attained.

The outlook for enteric medication looks quite hopeless. According to "A Study of the Emptying Time of the Stomach with Reference to Pills and Tablets" by Bukey and Brew in the December *JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION*, tablets may remain in the stomach of the same individual (at various times) from one to more than four hours.

Several conclusions were drawn from their studies of enteric coatings:

- 1st, that size and shape of pill, tablet or capsule have no effect on length of time it will remain in the stomach
- 2nd, the same individual does not react uniformly, etc
- 3rd, emptying time may be influenced by diet
- 4th, type of coating does not have any effect, etc

Chairman Ligorio of the Membership Committee had not had sufficient time to begin the work of his committee and was, therefore, unfortunately unable to report.

Two letters from President Robert P. Fischelis were then read in which he thanked the New York Branch and Dr. H. H. Schaefer for the testimonial dinner in his honor on January 29th.

The business part of the meeting being over, President Ballard called upon the guest speaker of the evening, Dr. David Bryce, who spoke on Medicinal Dyes. The address follows:

MEDICINAL DYES

BY DAVID A. BRYCE, M.D.

"Most of you, I feel sure, have had considerable experience of a conversational nature with doctors. Perhaps I am not betraying any professional secrets when I say that your experience has probably been largely that of auditors in such conversations. With your permission I shall restrict this address to six medicinal dyes. I feel sure that such technical information may be of direct benefit in your relations with your physician clients and if I may be permitted to do so I should like to digress a moment at this point to illustrate why.

"About fifteen months ago, one of the senior executives of my organization requested me to look into certain fundamental economic aspects of medicine, not only in its relation to commercial companies such as our own, but the inter-relationship between physicians. It is unnecessary to bore you with all the ramifications of that investigation which I pursued for several months at odd times, but there were two illuminating results which I pass on to you as of interest in the present discussion. Among other things, I sent out a questionnaire which was very carefully and intelligently answered by the majority of physicians. When we had compiled the results of this questionnaire, we were somewhat amazed to find that there was a feeling of great antagonism amounting almost to actual hostility, on the part of almost all of the replying physicians toward the retail pharmacist. This was so striking that in my journeyings about the country, I inquired of as many physicians as practicable, and in particular of certain physicians who I knew had answered the questionnaire as to just why they felt as they did. While it would be presumptuous for me to draw final conclusions from any such very brief and narrow investigation nevertheless one cannot help making some deductions or guesses. It appeared to me that the antagonism to which I have referred was due to the feeling by the physician that the retail pharmacist was allowing his interests to become so diversified in the field of commercial retailing to the laity, both of medical and nonmedical supplies that not only did the retail pharmacist fail to act in the best interests of his physician clients, but that his information on technical subjects, upon which physicians rely, was becoming exceedingly thin. Now please do not misunderstand me and consider that I am saying that this is so. I merely suggest that it appeared to me that physicians think it is so which may not be the same thing. Criticism in life is seldom just—it is more frequently

biased and reflective of the critic's state of mind than of the fault of the one criticized. At the risk of seeming discourteous to you I have mentioned this to night because it has appeared to have a bearing on such technical information as I am going to give in this brief address. Should you find it worth while to acquire highly technical, medical and chemical information of this type not only from me but from other medical directors and other persons who happen to be technically informed in special fields, it would appear likely that your acquired knowledge in such fields must inevitably be of use to your physician clients in their every day contacts with you. Such usefulness must inevitably redound to your own benefit by promoting a greater feeling of cordiality between pharmacist and physician. Perhaps this is far fetched, but at any rate I leave the suggestion with you for you to assay its worth. Now let us return to our subject.

"What are dyes? It is almost impossible to answer this question in such a way that the definition is universally applicable. A famous definition of a dye is that given by one of our Vice Presidents in a Customs Court case many years ago. He said that a dye was a substance having a definite affinity for animal or vegetable fibres and which in expressing that affinity, colored those fibres with the color of the dye. Let me illustrate what he meant. Imagine that I have here a cylinder of coffee and that into that I dip a cotton towel and then remove and dry the towel. It is true that the towel will be stained with the coffee, but coffee is not a dye, for if one inspects carefully the remaining coffee solution it will be seen that the color of that solution has not changed and that the color deposited in the towel is only that amount of color which ordinarily is carried into the fibres by the solution. In other words coffee has expressed no affinity of its yellow color for the cotton fibres. On the other hand, if I had here a cylinder containing a weak solution of Tartrazine Yellow and dipped into that a cotton cloth and removed and dried the cloth, not only would the cloth be stained yellow but the weak solution would have become almost colorless because of the affinity of the yellow color for the fibres which had been immersed therein. Thus you see there is a fundamental distinction between the two processes. The Tartrazine is of course, a dye. Unfortunately however, the definition will not stand up under severe cross examination by opposing counsel in a court of law. One must qualify any definition made. Suffice it to say for our purposes here this evening that a dye is in most cases an organic material containing the benzene nucleus or some ring structure that is colored in aqueous solutions and which color has an affinity for animal and/or vegetable fibres.

"What is a medicinal dye? A medicinal dye is one of the very, very few members of the dye series which by practical experience, and solely by such practical experience not by any theorizing—has been found to be of use in the treatment of human disease. The six medicinal dyes with which we are particularly concerned tonight are as follows: Methylene Blue, Crystal Violet, Neutral Acriflavine, Brilliant Green, Scarlet Red Sulphonate and Medicinal Fuchsin. A little later I shall show you some slides illustrating these dyes, together with slides of practical work which has been done in one of the fields of dye therapy, and at that time it will be easier for me to demonstrate the chemical formulas than to try to describe them now.

"A description of medicinal dyes would certainly be incomplete without some mention of their early history. As in the case of almost every synthetic organic chemical, commercial development and scientific development have proceeded, if not actually hand in hand at least closely associated. One of the first artificial dyestuffs, if not actually the first ever made was Picric Acid or Symmetrical Trinitrophenol, $C_6H_3(OH)(NO_2)_3$, prepared in 1771 by Woulfe from indigo and nitric acid. Nearly a century later a technical method was developed for the separation of picric acid from coal tar. The dye industry has been largely an outgrowth of that discovery, subsequently various colors such as mauve, magenta, rosaniline blue, Hoffmann's violet, aniline black, methyl violet, methyl green, and many others were discovered and commercially manufactured in England and France. At the same time that this dye research was proceeding, scientific research in pure science was likewise being carried forward and Kekule gave the world his epoch making hypothesis as to the structural formula of the benzene nucleus. It is unnecessary for me to burden you with all the steps in the development of the synthetic dyestuff industry, but it is interesting to note that between the years 1890 and 1911, the commercial development of dyes for technical purposes becomes a race not only between rival concerns but between the laboratory and the manufacturing plant. The rivalry was frequently expressed in international terms, but Europe was far ahead of the United States at that time. Great companies such as Badische Meister, Lucius & Bruning, Griesheim Elektron, and others were constantly producing new and

better dyes or intermediates. The extraordinary capability of the German people for methodical and patient research was peculiarly adapted to the development of dyes. Accordingly Germany had forged far to the front in this industry when the unfortunate outbreak of hostilities in Europe in 1914 forever terminated the ascendancy of Germany in this art. At that time Germany was responsible for more than 75% of the total world production of synthetic dyes, and actually supplied in excess of 90% of all the dyestuffs used in the great textile manufacturing centres of Great Britain. To meet the situation arising from the war, the various foreign governments associated in the prosecution of war against the Central Powers, severally subsidized financially (and aided legally by the seizure of German patents) the formation of dye manufacturing corporations destined eventually to exceed in skill that of the original German manufacturers.

"From a medicinal point of view, the war brought a development of interest in certain of the medical dyes used for the treatment of the enormous number of wounds at the various hostile fronts. From a surgical standpoint this over-interest in medicinal dyes and antiseptics was exceedingly unfortunate. Dyes are the most delicate of chemical weapons against disease, their structure being such that they frequently change in contact with living tissues to so-called leuco dyes. Leuco dyes are colorless. These leuco dyes frequently change into intermediate forms and then back again to the original dye form. This may easily be demonstrated in the laboratory by bubbling hydrogen sulphide through a cylinder containing a dilute solution of methylene blue. The Methylene Blue is rapidly reduced to the leuco form and the solution becomes colorless. If one wishes now to demonstrate that the dye is still present and has not been permanently changed essentially, one may bubble oxygen through the solution or one may add an oxidizing agent like ferric chloride, whereupon the color of the methylene blue will rapidly return. This same oxidation-reduction sort of reaction goes on constantly in the body, and is doubtless responsible for some of the medicinal qualities of the dyes. Now materials of such delicate structure are not particularly well adapted to war wounds. The latter are primarily massive injured areas of tissue, deeply contaminated with all kinds of dirt, containing crushed fragments of skin, muscle, tendons and even bone and such wounds become secondarily infected. The most efficient antiseptic for that type of wound is surgical cleaning up or debridement. Following that it frequently is necessary to use chemical materials which dissolve out debris, such as Dakin's Solution.

"Only in cases under very careful hospital conditions would the dyes be particularly applicable. Nevertheless the dyes were widely used during the war and when good results were not obtained, the blame was laid at the door of the dyes rather than the operator employing them.

"The present world dye situation is that there are four important groups competing with each other for world markets. In England there is Imperial Chemical Industries, Ltd., consisting of British Dyestuffs Corporation, Solway, Oliver Wilkins & Co., and other firms. In Germany there is the great combination known as Interessen Gemeinschaft für Farben Industrie, which contains among others, Badische Anilin, Meister Lucius & Brüning, Baeyer, Cassella, Kalle, and Griesheim Elektron. In France, the great unit has been the Kuhlmann group which has collaborated to a certain extent with the Society of Chemical Industry in Switzerland, with Geigy and others. In the United States, a definite amalgamation of all the chemical companies has neither been legally possible nor commercially desirable. Nevertheless, from scientific and research viewpoints, the work of the American dye companies has been greatly aided by the Chemical Foundation of New York. The great dyestuff manufacturers in this country are DuPont, American Cyanamid, Calco, National Aniline, General Dyestuffs, and several other smaller concerns. If any of you wish to pursue this matter further I refer you to the work by Thorpe on 'Synthetic Dyestuffs,' published by Griffin & Co. of London, from whom I have drawn liberally for the above facts.

"If we may have the slides at this point, I think I can illustrate the nature of each of the dyes, and then go on to a brief discussion of them. The first slide shows the structural formula of Methylene Blue. This is one of the oldest and one of the most interesting of the dyes. Doubtless you have read a great deal in the newspapers concerning the use of Methylene Blue in cyanide poisoning, in illuminating gas poisoning, in carbon monoxide poisoning and in various other conditions. Methylene Blue was proposed as an antidote for such intoxications by Mathilda Brooks and J. C. Geiger, independently, in the West. I have a folder about two inches thick on this subject in my files, but it will suffice to say here what while methylene blue is a moderately good antidote for cyanide poisoning, there are apparently better antidotes. The work of Chen,

Rose and Clowes on nitrites and sodium thiosulphate as well as sodium tetrathionate apparently points the way to more efficient antidotes. For any of you interested in looking up that subject, you will find it in the *Proceedings of the Society for Experimental Biology and Medicine*, Volume 31, page 250 year (1933). Since methylene blue apparently forms meth hemoglobin when in contact with hemoglobin, it seemed from the first unlikely that it would be useful in carbon monoxide and similar poisoning. This point was well made by Haggard and Greenberg of Yale (*J A M A*, 100, 2001 (1933)). However, there have been interesting reports by other men, particularly those by Christopherson (*J A M A*, 100, 25, 2008 (1933)) and Steele and Spink (*New England Journal of Medicine*, 208, 1152 (1933)). We have not heard the last of methylene blue and doubtless scientific investigations now in progress will show some interesting uses for it in medicine but at the present time it may in emergency be used as 50 cc of a 1% solution intravenously for cyanide poisoning and for the ordinary surgical uses. These latter uses are in infected sinuses, in wounds, in injuries and diseases about the mouth, pharynx, gums and accessory sinuses. Methylene blue is locally the mildest although not necessarily the least toxic of the medicinal dyes in common use. It is a mild bacteriostat. It is ordinarily used in solution of 1 to 1000 or may be used in stronger solutions where particularly indicated. Methylene Blue has some use in malaria and the recommended dose is 1 Gm per day by mouth in conjunction with quinine compounds, where it is particularly valued in the treatment of aestivo autumnal malarial fever. There is one interesting use of methylene blue which deserves some mention. It was first recommended by Blanc in France several years ago as of use in tuberculosis of the bladder. Symptoms from this complication of tuberculosis are extremely annoying to the physician and agonizing to the patient. There is constant pain, and a desire to urinate every few minutes. It is very difficult or impossible to relieve this situation short of curing the tuberculosis. Blanc claimed to have found that methylene blue alleviated the symptoms. Greenberg in this country published within the last couple of years on the subject, and has found excellent results with certain types of methylene blue. He feels that certain so called impure varieties produce a great deal of irritation and are very much less efficient than other pure varieties. The dose used is 1 grain three times a day, and it may also be used in a solution of 1 to 500 to 1 to 1000 in the bladder. Five cc of a 1% solution have also been used for instillation into the bladder.

Crystal Violet—You can see the formula and appearance of the material. So-called Gentian Violet is a mixture of several para rosaniline hydrochlorides. We have particularly sponsored the idea that it would be better to have a dye in this category which is a pure crystalline material and accordingly we have developed and will market the hydrochloride of hexamethylpararosaniline known as Crystal Violet rather than the mixture which has previously been known as Gentian Violet. From a strictly practical point of view there is little clinical difference in the effects of the two. Crystal Violet is of particular interest because it appears to be especially effective against gram positive bacteria. Such bacteria are staphylococci and to a limited extent streptococci also the bacillus of diphtheria.

"Accordingly, where an invasion by such organisms is suspected or feared, Crystal Violet is particularly indicated. It is used in strengths of 1 to 500 or 1 to 1000. Where there are a great many staphylococci in the blood stream, the so called staphylococcic pyaemia, the use of the dye intramuscularly has been recommended. It apparently works in some cases, but I have heard of other cases in which it did not work. There has been an immense amount of interest in the use of Gentian Violet or Crystal Violet in the treatment of severe burns because of the rather startling and originally brilliant work of Aldrich in Boston. I am going to refer to that a little later and show you his own slides.

"Neutral Acriflavine—Acriflavine belongs to the Acridine group of dyes which derive their names from a yellow color. They are chiefly known as Flavines in Europe. The practical usefulness of the group was discovered in 1912 by Ehrlich in the treatment of African trypanosomiasis. Neutral Acriflavine appears to possess marked antiseptic and germicidal properties against some gram-negative and some gram positive organisms. It has the disadvantage that when taken internally, it appears to be the most toxic of the dyes or at least of those in common use medicinally. Small amounts of it, such as a few grains a day will produce severe nausea and vomiting. It is however, widely used in infections of the genito urinary tract taken by mouth in a dose from $\frac{1}{2}$ grain to $1\frac{1}{2}$ grains three times a day. The urine must be rendered or maintained alkaline. It appears to be effective in the urine against both gram negative bacilli such as

the colon bacillus, and gram positive cocci. It is occasionally used in wounds in a solution of 1 to 1000 and I understand is used in England for burns.

"Acridivine has probably been most widely used throughout the world for the treatment of acute, subacute and chronic urethral gonorrhea. It has not only been used by mouth and intravenously, but has been used in solutions of from 1 to 3000 and from 1 to 4000 for direct irrigation of the urethra. I will not debate with you the advisability of irrigation treatments in gonorrhea in the male, but I think in general it is frowned upon except in very expert hands and where there are particular indications therefor. Of course, in the female, it is an entirely different matter.

"*Scarlet Red Sulphonate*—This material is a complex sodium salt related to beta naphthol. This dye belongs to the group of so called 'azo' dyes which derive their names from this linkage of two nitrogen atoms which I show you here. Both this material and its congener, Scarlet Red Medicinal Biebrich, have a curious effect of stimulating the growth of the epithelial tissues. Apparently this effect does not extend to other tissues such as fibrous tissues. This material also was greatly abused in surgery both during and subsequent to the war. It must be remembered that any such material must be used only in a clean wound. To attempt to stimulate an infected or contaminated wound would not only be dangerous if you could do it, but fortunately in most cases, you cannot do it. Of course, there are certain exceptions to this rule, particularly the very new technique known as seed implantation of epithelial grafts into infected surfaces, but this is merely the exception that proves the rule. Scarlet Red Sulphonate is slightly soluble in water and more so in alcohol, and thus may be put into solutions in strengths of from 1 to 4% to be applied to clean wounds or the clean edges of wounds for the stimulation of repair. Bettman of Portland, Oregon, has devised a new technique in the use of this material in the promotion of the healing of burns and of skin grafts.

"*Brilliant Green*—There is little essential difference in the indications for the use of Crystal Violet and those for the use of Brilliant Green. However, Brilliant Green is probably a less efficient bacteriostat and a more efficient stimulant of wound repair. Otherwise, there is little difference and Brilliant Green is very much less used in surgery than Crystal Violet. There has been some new interest in Brilliant Green because of the work of Professor Senin at Nijni Novgorod in Russia. This gentleman has used it in the treatment of sycosis vulgaris, or so-called 'barber's itch'. Technique of his treatment has been to remove all crust and scale with a 5% salicylic ointment and then to lightly brush the areas with a dry sponge, opening them up and then painting them every day with a 1% alcoholic solution of Brilliant Green and 70% alcohol. The treatment is favorably considered in England.

"*Medicinal Fuchsin*—This too, somewhat like Gentian Violet is a mixture of Rosaniline Hydrochloride. It is said to be a mixture of rosaniline and pararosaniline hydrochlorides and its formula is as you see. You are doubtless familiar with the use of Fuchsin and Carbol Fuchsin as stains for the staining of tuberculosis organisms. I should emphasize here that the medicinal grade of dye is not the grade used for staining in the laboratory, and you should make that distinction to your physician clients if they inquire. Biological stains are standardized according to the methods of the Biological Stain Commission in Washington, and are sold by different firms and subjected to different processes than medicinal dyes. The interest of recent years in Fuchsin has been two fold. First, the interest in its use in athlete's foot, trichophytosis and similar infections. We have recommended particularly a 10% alcoholic solution of basic fuchsin to which has been added 5% aqueous carbolic acid, 1% boric acid and 10% resorcin and 5% acetone. The technique for this may be found in the publication by Tobias (*Journal of the Missouri Medical Assn*, 27, 443 (1930)). The second very interesting use of fuchsin is in connection with burns. This is as yet unpublished and I shall refer to it later in the section on burns.

"I think I have now given you a rough bird's eye view of the six medicinal dyes in common use, their chemical formulas, their physical characteristics, and appearance, and the chief uses at least in outline form. It might be well at this point to advise you of certain contra-indications which apply not absolutely, but in general, to most medicinal dyes. In the first place, they are apparently not well tolerated by the eye. I cannot give you extensive literature basis for this, but I am fairly certain that one should not employ these dyes in the eye. Of course, there may be an exception where it is necessary to use Scarlet Red Sulphonate in connection with grafts on the lid but in general their use in the eye is to be avoided. Then, too, dyes of an amount in excess

of 0.5 Gm should not be injected in solutions into closed cavities such as the pleura, the joints etc While it is unlikely that $\frac{1}{2}$ Gm of any dye would produce fatal symptoms, nevertheless, a reasonable precaution is not to inject into closed cavities more than $\frac{1}{2}$ Gm of any dye Finally, dyes should not be used in contaminated, dirty and crushed wounds, until those wounds have been surgically cleaned up and put in shape for irrigation and healing Further, patients, who have been taking large amounts of dyes internally should not be exposed to direct sunlight in places as the West where the rays of the sun are extremely intense This probably also holds true for mercury 'sun lamps'

"And now with your permission, I would like to turn to a subject in which I have been very much interested for about fifteen years The subject is the treatment of burns involving large areas of the body You are doubtless familiar with the old time remedy of carron oil which was smeared upon burns with the greatest abandon, without much effect except to break down the skin and superficial tissues and furnish an excellent feeding ground for all the bacteria present plus all the bacteria carried in by the carron oil Since then there has been a steady effort upon the part of surgeons throughout the United States to correlate their information and statistics upon burns and to derive therefrom sound conclusions which indicate the way in which the treatment of burns should be directed The oldest theory in this regard is that a specific protein arises as the result of the burn process, and that this split protein exercises a severe depressing effect upon the central nervous system, and upon the cells of the body as a whole, at times inducing ulceration of the gastrointestinal tract severe shock, prostration, fever, delirium, and in many cases, death A very logical outgrowth of this theory was the treatment of burns by coagulation of the burned areas Obviously, if these areas were liberating progressively a toxic protein, coagulation of the area prevented this liberation, and so diminished or entirely eliminated, theoretically, the effects I have enumerated above This coagulation treatment is now generally known as the tannic acid treatment of burns and was introduced by the late Dr Davidson at Henry Ford Hospital in Detroit where it is still thought of very favorably I have not time to night to give you a full consideration of the facts and fallacies in connection with this theory It is sufficient to say that certain observers in widely scattered communities have reported excellent results from the tannic acid treatment of burns and that in competent hands it appears to be useful In all probability, the theory of a burn protein producing the toxicity of burns is not completely tenable

"The second theory of importance in regard to burns was that of dehydration or abstraction of water or tissue fluid This theory was lent considerable color by the known increased viscosity of the blood following a burn, the severe renal symptoms and various other factors clearly indicating not only an abnormal water exchange in the body following a severe burn, but an emergency need of the body for large additional quantities of fluid Certain investigators felt confident that this dehydration was not a mere temporary concomitant of extensive burns, but was in fact the principal underlying cause of the extremely serious effects seen in severe burns within 24 to 72 hours after such cases were admitted to hospital wards Accordingly, it was a logical outgrowth of such theory, that the introduction of large amounts of fluid, either as water, or glucose solution, or saline solution, subcutaneously, intravenously, and even intraperitoneally, was in order These measures gave extraordinarily good results in the immediate mortality of burns, and to that extent bore out the theory I might say parenthetically that the above adjuvant measures are now routine in every good hospital regardless of what principal treatment may be used and it is likely that the proponents of this theory merely discovered something that was absolutely true about burns but was not the principal factor

"The third theory to which I alluded above, recently proposed in Boston, is that the intoxication following severe burns is directly the result of infection Certain investigators in 1932 conceived the idea that all the serious effects observed after 12 hours in burned patients were due to the toxemia resulting from infection of the burned area Obvious as this theory might appear on the surface, its proof is not easy The best proof was as is so frequently the case in surgical conditions, empirical by actual trial and error Treatment designed solely to eliminate infection in the burned area produced such a surprising result as to lend considerable support to the theory itself This does not mean that the ordinary surgical precautions of the light tent heat externally applied, fluids, treatment of shock, etc, should be neglected However, these workers in Boston have devoted their principal efforts, in addition to these routine surgical efforts, toward the restraint of infection The original treatment of this kind was to clean up the burned area, treat the

shock, and then place the patient under a so called 'light tent' This is simply a cradle covered with a blanket and containing electric lights which shed an even light and temperature upon the patient who, of course, is unclothed The temperature underneath the cradle is kept regulated to between 88° F and 90° F by constant inspection of the thermometer kept hanging therein The original treatment for the first eight hours was that the patient was sprayed on the burned area by an ordinary vaporizing spray with a 1% solution of Gentian Violet or as was later used, Crystal Violet This served to form a light, tough eschar to prevent oozing and loss of fluids, to keep the area sterile, and not least important to render the whole area analgesic After a firm eschar had been formed, the area was sprayed every six hours during the day There were various surgical refinements which it is unnecessary for me to go into Suffice it to say that this treatment in competent hands in Boston City Hospital has proved eminently satisfactory not only in the immediate results, but in the eventual results I have seen these patients up and around the ward in light cotton gowns, seated in chairs, eating their meals in an incredibly brief period of time The growth of the tissues beneath the eschar has been rapid and excellent In many cases, skin grafting has either been avoided entirely or reduced to a minimum It must be borne in mind that neither this treatment nor any other treatment can eliminate the eventual plastic surgery, with all its delicacy and refinements, which becomes necessary following very severe burns of any area of the body Since this original treatment in Boston, I have had the privilege of collaborating in some of the subsequent work, and have made certain suggestions and furnished certain material for the improvement of the technique At the present time, we believe that mixtures of dyes, probably Crystal Violet, Acriflavine and Brilliant Green or Fuchsin will be used in place of the original Crystal Violet This is done to hit the various groups of organisms by the method of a shot-gun charge If we may now have the slides which Dr Aldrich has kindly loaned me, I will show some of the results with the original Crystal Violet treatment

"I must compliment you upon your patience in listening to what must have been a rather technical exposition, on a rather technical subject It is a little difficult for one in my position to get together a talk which will be of interest in the rather highly technical field involved in our work

"I trust, however, that I have been able to give you some insight into the interesting possibilities of medicinal dyes and let me assure you that if at any time in the future I can give you additional information, I should be more than pleased to receive your letters and shall do my best to answer them promptly Again, let me thank you for the courtesy you have extended to me this evening by your invitation to address you and express the hope that I may some time attend some of your other meetings as a listener and not as a speaker "

Following the completion of Dr Bryce's address considerable discussion ensued with many questions being asked by members in the audience These were all carefully gone over and Dr Ballard called for a rising vote of thanks to the speaker

RUDOLF O HAUCK, *Secretary*

PHILADELPHIA

The January meeting of the Philadelphia Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held in the Temple University School of Pharmacy, January 8 1935

The minutes of the previous meeting were read and approved and after an announcement concerning the next meeting, President Barol introduced Dr James C Munch as the speaker His topic concerned 'Recent Developments in the Pharmacology of Digitalis'

He began with a history of the drug, stating that Withering did not recognize its effect on the heart This effect is now believed to be a sedative one rather than tonic Of the 150 active principles formerly listed only 6 are now recognized as having definite heart action

Dr Munch said that about 22 drugs have actions similar to digitalis and discussed the specific actions of Strophanthus Squill, Adonis, Apocynum and Convallaria Of these Adonis has the same potency as Digitalis, Apocynum is twice and Convallaria three times as potent

He said that at the present time 58 methods have been devised for the assay of Digitalis, the newest using the snail heart and is found to correspond to the one hour frog method The toad method used in South Africa, and the pigeon method were also mentioned

Dr Munch described work now being done to study the cumulative activity of digitalis

When the therapeutic dose was administered to a group of cats over a 3 day period, a degeneration of the heart muscle was noted

Potency and standardization were discussed and a series of lantern slides used to illustrate parts of the lecture

Before adjournment a general discussion took place regarding such topics as acid and alkali hydrolysis, preservation of finished products, methods for determining rate of deterioration, the new international digitalis powder standard and the preference for chemical or physiological methods of assay

E H MacLAUGHLIN, *Secretary*

THE NRA

Elliott Thurston is of the opinion that no prophet lives who can tell what Congress, more especially the Senate will do, or when it will adjourn, or what will happen to the legislation affecting the codes and eventually the Supreme Court will decide. State codes have also been affected by decisions—in Wisconsin 20 codes were nullified by a sweeping decision of Chief Justice Marvin B. Rosenberry on March 5th.

Whatever may be said, *pro and con* the drug code has functioned well and to these officials much credit is due.

NARCOTIC RAIDS

The Narcotics Bureau has been eminently successful in bringing to court narcotic peddlers and Commissioner H. J. Anslinger is to be congratulated on his success. No class is more deeply interested in legal restriction of the dispensing of narcotics than pharmacists.

A cross section of the misty world of the narcotic peddler and addict is expected by Narcotics Bureau officials to result eventually from the spectacular Nation wide raid.

AN IMPORTANT DECISION

The recent injunction granted to Eli Lilly & Co., in its case against the Sunset Drug Company for violation of the Lilly contract price under the California Fair Trade act is doubly important to retailers in that state and other states which may pass similar acts. This decision indicates that contracts through wholesalers are valid under the act.

CANCER CURE VENDOR ESCAPES PROSECUTION DIES WITH CANCER

A self styled cancer specialist of Hastings, Mich. died of cancer on the eve of his prosecution on charges of violating the Federal Food and Drugs Act. His principal medicine, "Mixer's Cancer and Scrofula Syrup," composed of potassium iodide, senna, licorice, yellow dock root, sarsaparilla, wintergreen, glycerin alcohol and sugar syrup, had for a long time evaded the Federal law, until Food and Drug Inspectors intercepted a shipment to Chicago and based a recent case on it. Even during Mixer's last illness, his office force continued to sell and ship the so-called "cancer cure."

A cyclone damaged the offices of Secretary Walter D. Adams of Texas Pharmaceutical Association. B. G. Edwards, of Forney, Texas, suffered loss by the destruction of his residence and damage to his store. The storm lasted only about a minute however, during that time caused much destruction, some injuries, but no loss of life.

Secretary H. W. Ayres, of the Washington State Pharmaceutical Association for the past ten years has taken a leave of absence until September 1st in an effort to fully recover his health.

Charles E. Turner, former druggist and Mayor of Dallas, has been designated to handle the finances of the Texas Centennial.

RICHBERG HEADS NRA BOARD

Donald R. Richberg has been appointed by President Roosevelt as acting chairman of the seven-men NRA board. The appointment is temporary only until the revised NRA act is passed by Congress, Mr. Richberg will continue his duties as director of the emergency council.

EDITORIAL NOTES

UNITED STATES CIVIL SERVICE EXAMINATIONS

Applications for the positions of chemist, and senior, associate and assistant chemists must be on file with the U S Civil Service Commission at Washington, D C, not later than April 8, 1935

The entrance salaries range from \$2600 00 to \$4600 00 a year, less a 3½ per cent retirement deduction

In each of the grades, separate lists of eligibles will be established in accordance with the specialized qualifications shown by applicants A number of existing vacancies in the Food and Drug Administration, Department of Agriculture in all grades will be filled from these examinations, as well as a vacancy in the grade of assistant chemist in the Dental Alloy Laboratory, National Bureau of Standards, Department of Commerce

Full information may be obtained from the Secretary of the United States Civil Service Board of Examiners at the post office or custom house in any city which has a post-office of the first or the second class, or from the United States Civil Service Commission, Washington, D C

THE TERCENTENARY OF CHEMISTRY

"Dr C A Browne, chief of chemical and technological research of the United States Bureau of Chemistry and Soils, has officially established 1635 as the date of the birth of American chemical work Then John Winthrop, Jr, founded the industries that are now so vital to national defense and form so large a source of national wealth

"At a tercentenary celebration of the American Chemical Society the memory and the vision of this great colonist will be honored when the history of the birth of chemistry in this country, compiled by Dr Browne, will be read"

In 1642, the General Court of Massachusetts passed an order to raise and produce materials for making gunpowder Winthrop planned for the production of salt, glass potash, saltpeter, medicines, alum and other materials

DRUGS FROM AUTOMATIC MACHINES

An amendment to the Food and Drugs Act Bill of Australia provides that no person shall (a) Install any automatic machine for the sale or supply of any drug or medicine, (b) permit any such automatic machine to be installed,

(c) sell or supply any drug or medicine by means of any automatic machine 'Automatic machine' means any machine or mechanical device used or capable of being used for the purpose of selling or supplying goods without the personal manipulation or attention of the seller or supplier or his servant or agent at the time of the sale or supply Among the reasons given for the clause were the following 1 The accessibility of the machines to children and young people 2 The fact that they provide an uncontrolled means of disposing of dangerous drugs 3 The danger of manipulation whereby a noxious drug may be substituted in place of the original packet 4 The fact that the use of the machines leads to the distribution of habit-forming drugs in small quantities, e g, three tablets for a penny and twelve for threepence 5 The difficulty of control under the laws relating to poisons and early closing

A PLAY BASED ON THE LIFE OF SEMMELWEIS

In Vienna a play has been produced with the title "Dr Semmelweis," from the pen of Hans Refisch (See *Journal of the A M A*, February 23, 1935) "The plot was taken from the life of the immortal physician The drama deals with his struggles and the misjudgment of him by his colleagues This drama has been produced only in Vienna, which failed to appreciate Semmelweis, seeing in this benefactor of humanity only a charlatan and driving him away The play as a literary work is not well done, because it consists of long dialogs and tedious scientific disputes Nevertheless the audience liked it The leading literary reviews of western Europe have dealt with it meritoriously" See editorial, *JOURNAL A PH A*, 6, 341 (1917) Also pages 351 and 382 same issue

The press has reported the finding of twelve pieces of broken pottery on the site of ancient Lachish (one of the capitals of the Canaanites) Dr J L Starkey, head of the *Wellcome Archaeological Research Expedition*, who found the potsherds, entrusted the task of deciphering the inscriptions to Prof Torczyner at Hebrew University of Jerusalem According to the latter this is a most remarkable find, a remarkable fact is that they appear to be written in ordinary ink

PERSONAL AND NEWS ITEMS

Dr Charles A Shull, professor of plant physiology at the University of Chicago, lectured before the Graduate College at the University of Iowa, on March 25th on "Radiation and Life"

Francis P Garvan, president of the Chemical Foundation and recipient of the Priestley Medal as "the greatest lay patron of chemistry," is honorary chairman of the New York Committee organizing the 300th anniversary of the Chemical Industries celebration Prof Arthur W Hixson of Columbia University is general chairman Senator Pat Harrison of Mississippi and Representative James W Wadsworth of New York will be among the speakers at a dinner meeting on April 24th

President Coffman's biennial message (University of Minnesota) is entitled "Youth and Tomorrow's Education" a presentation of some of the problems which confront universities The message has been published in booklet form

Howard B Lewis, director of the College of Pharmacy of the University of Michigan and Professor of Physiological Chemistry in the Medical School has been elected a member of the National Board of Medical Examiners of the United States to succeed the late Professor Otto Folin of Harvard

Mary Dahlgreen Robinson—of Saint Davids, Pennsylvania through Charles E McCormick, of Baltimore—has donated two mortars, several old dispensing bottles and a quassia cup—to the American Institute of Pharmacy

Dean R. C Wilson, University of Georgia, has addressed the radio audiences on narcotic legislation and unregulated sale of barbituric acid preparations and certain other sedatives and hypnotics

J D Ashmore, of Greenville has been named president of South Carolina Pharmaceutical Association succeeding L E Bishop, who has removed from the state

Dean A O Mickelsen addressed the members of the North Pacific Dental Alumni Association at their annual meeting which was held at North Pacific College, February 7th-9th His subject was "Prescription Writing by the Dental Profession" Four hundred and seventy alumni members attended

American winners of the Nobel awards will be guests of honor at a dinner in the Waldorf-Astoria, April 9th, celebrating the 101st anniversary of the birth of Alfred B

Nobel, Swedish scientist who created the awards

The Hillebrand award of the Washington branch of the American Chemical Society was presented at the society's annual banquet at the Cosmos Club, March 14th, to Dr F D Rossini of the Bureau of Standards in recognition of fundamental work on the thermochemistry of hydrocarbons and alcohols

Margaret Cousins has written "Purple Cloud," a story of Bernard Courtois, published in the *Southern Pharmaceutical Journal*

Dean D B R. Johnson, College of Pharmacy, University of Oklahoma, is to be honored with a memorial by members of the faculty and friends

Gustav Bachman, former secretary of Minnesota Pharmaceutical Association, was presented by members of the organization with a beautiful pen set The presentation was an interesting part of the program of the annual session of the Association

OBITUARY

EZRA J KENNEDY

Ezra Joseph Kennedy, member of the AMERICAN PHARMACEUTICAL ASSOCIATION since 1887, died of heart disease, February 20th at his home in Rutherford, N J, aged seventy five years

Mr Kennedy was born in Attica, Ohio, where he received his earlier education, in 1882, he was graduated from the pharmacy department of the University of Michigan While engaged in retail pharmacy in and near Detroit, he taught pharmacy at the Detroit College of Pharmacy Later he became associated with the *Pharmaceutical Era*, and when the publication came to New York, Mr Kennedy took up his residence in New Jersey He remained with the *Pharmaceutical Era* for more than forty years, until his retirement several years ago

Surviving are four daughters, Mrs E A Dougherty, Mrs Herbert Bond and Mrs W G Macomber, of Rutherford, and Mrs Ralph W Boyd, of Drumright, Okla, and two sons Ezra J Kennedy, of Rutherford and Fred H Kennedy, of Cleveland

SOCIETIES AND COLLEGES

COMMITTEES FOR A PH A MEETING

Dean A O Mickelson, of the North Pacific College of Pharmacy has been named Local Secretary

The following committees have been named by Harvey J Donnell, secretary of the North Pacific branch of the A Ph A

Convention L F Haack *Chairman*, Frederick Grill, *Secretary*, F A Geue, *Treasurer*, F C Felter Frank Nau, Edgar Stipe, Earl Gunther, all of Portland

Entertainment H J Frank *Chairman*, Peyton Hawes, M C Kaegi, all of Portland

Reception Dean Adolph Ziefle, Corvallis, Ore

Women's Auxiliary Mrs Ralph A Watson, *Chairman*

Representatives named in the various Northwest states, include

Oregon George W Steelhammer, Silverton, Ernst T Stuhr, Corvallis, George C Blakeley, The Dalles, and Roy A Perry, Portland

Washington Dean C W Johnson, Seattle, P H Dirstune, Pullman, L D Bracken, Charles G Ajax, Seattle.

California K B Bowerman San Francisco, Frank E Mortenson Los Angeles, T D Perkins, San Diego

Idaho E O Leonard Pocatello, Charles Carter, Moscow, R M Curist, Standpoint

Montana C E Mollet, Missoula, Emil Starz, Helena, J L Kracker, Bozeman

MEETING OF THE PLANT SCIENCE SEMINAR

The 13th Annual Meeting of the Plant Science Seminar will be held in Portland Oregon, time to be fixed according to a recent announcement by President Frank H Eby

For the first time in the history of the Seminar, the Annual Meeting will be held on the Pacific coast and a large attendance is anticipated Professor E T Stuhr of the Oregon State Agricultural College has been appointed local secretary He has not announced a program but information will appear in the JOURNAL as soon as announcements are made

All persons interested in drug plants are urged to attend the 1935 Seminar Complete information may be obtained by directing communications to the secretary of the Seminar,

F J Bacon, Western Reserve University, Cleveland

DRUGGISTS' BUSINESS CONFERENCE AT PURDUE

March 13th and 14th were important dates for retail druggists in Indiana The fifth annual Druggists' Business Conference was held in the Memorial Union Building on the campus of Purdue University During these two days, problems of vital importance to druggists were discussed

This conference is arranged for druggists and their clerks, and is sponsored by the Pharmacy Extension Department The Indiana Pharmaceutical Association took an important part on the program, and discussed recent legislation as it pertains to the druggist President R P Fischelis, of the A Ph A was an honored guest speaker

A "one act play" was given March 13th, at 8 00 P M, following the dinner and evening address at 6 30 P M The occasion honored Dean C B Jordan upon the completion of twenty-five years of distinctive service as dean of Purdue University School of Pharmacy

BI-CENTENNIAL OF THE ACADEMY OF MEDICINE, MADRID

The Academia Nacional de Medicina of Madrid celebrated recently its second centennial The festivities included several meetings during the medical week and an exhibition of the books of the library which has, among other books of great importance, the Codex scientiae medicinae of Avicenna, in five large volumes and a collection of books written by Hipolito Ruix on American plants, which for more than three centuries were a source of information for botanists and designers from all over the world

IOWA

The annual election of officers of Iowa Pharmaceutical Association resulted as follows *Honorary President*, J F Shuey, Jefferson, *President*, W H McClelland, Corning, *First Vice-President*, R J Allen, Sioux City, *Second Vice-President*, A E Thomas, Des Moines, *Third Vice President*, George McShane, Waterloo, *Treasurer*, J M Lindly, Winfield

Members of the Legislative Committee George Judisch, Ames, George W Gillman, Ft Dodge, T H Kenefick, Eagle Grove, J J Gillespie, Des Moines, W F Meads, Des Moines

Among the visitors were Secretary John W Dargavel, of the N A R D, Guy Butler, Lincoln, president of the Nebraska association, J G McBride, secretary of the Nebraska association, Otto A Kuether, Herington, president of the Kansas association, W M Newmark, Topeka, secretary of the Kansas association, W H Varnum, Lawrence treasurer of the Kansas association and secretary of the Midwest Conference, Coleman Dais, Seminole, president of the Oklahoma association, A Roy F Johnson and F G Kustermann of the Minnesota association, J P Jelnek, president of the Northwest Pharmaceutical Bureau and J R Bruce and Frank M McCabe of *North Western Drug-gist*

F W Fitch, Des Moines, has completed an analysis of the price stabilization situation within the drug industry and with the assistance of his attorneys has worked out a plan which he believes is both simple and practical

The plan is based on the filing and registration with each secretary of state the manufacturer's trade mark and resale price. Briefly, this means that in each state the manufacturer would file his trade mark and resale price under a law making it a violation for anyone to sell trade marked merchandise at any other price than that filed with the Secretary of State

According to the proposer's belief the plan is advantageous to the manufacturer in that it would mean just one operation in each state instead of contracting with several thousand druggists in each state. He contends it should be easy of enforcement because it is a state statute, instead of a violation of a contract between individuals

NORTHWEST PHARMACEUTICAL BUREAU

At the annual conference dinner of the Northwest Pharmaceutical Bureau in Des Moines February 20th, President John P Jelnek of St Paul stated that the organization through its annual Great Northwest Drug Show had turned into the Northwest association treasuries almost \$40,000 00 during its years of existence

The following officers were elected *President*, James J Gillespie, Des Moines, *Vice President*, Fred G Kustermann, St Paul, *Treasurer*, Robert M Gibson, Des Moines, *Secretary*, N Vere Sanders, Albert Lea, *Executive Committeemen* Otto A Bjornstad Spencer, Ia, John P Jelnek, St Paul, Minn, Edward J Boberg, Eau Claire, Wis, Homer L Hill, Towner, No Dak, Fred L Vilas, Pierre, So Dak, *Committeeman at large*, E L Beezley, Cedar Rapids, Ia

NORTH DAKOTA

The fiftieth annual convention of the North Dakota Pharmaceutical Association will be held in Fargo, June 11th, 12th and 13th

WISCONSIN

Ralph W Clark reports that the first mid winter conference, held by the Wisconsin Pharmaceutical Association, February 27th was well attended and conceded by all to be a great success. Over three hundred druggists came to this business session fully realizing the seriousness of the present times as far as independent merchants are concerned. They showed their willingness to follow the able guidance of their officers and legal counsel and most certainly will cooperate with them throughout the present legislative session

Attorney Mount, Milwaukee counsel for the Wisconsin Pharmaceutical Association, explained the proposed legislation, the Wisconsin Fair Trade Practices Act which has been introduced into the Assembly. This legislative body arranged an informal committee hearing on the bill which was attended by the druggists and others representing independent merchants' organizations

MINNESOTA

Conforming to the usual program a session of Minnesota Pharmaceutical Association was devoted to the Scientific and Practical Section under the chairmanship of Dean Frederick J Wullung. Among the many papers presented were 'Plants and Their Relation to Man,' by Gustav J DeMars, 'The Open Prescription Department,' by President Theodore A Arneson, 'British Pharmaceutical Codex,' by F A Upsher Smith, 'The Operation of a Hospital Pharmacy' by Sister St George and a most comprehensive and interesting report by the retiring secretary, Gustav Bachman. The section included, also, many other interesting papers of scientific importance

Although illness depleted the official ranks of the Minnesota State Pharmaceutical Association during the organization's convention in St Paul the week of February 26th, the meeting was highly successful from every viewpoint, ushering in a second half century of service to its members with renewed enthusiasm and determination

MINNESOTA NOMINEES

The following are nominees for the Minnesota association offices—to be voted upon by mail—ballots to be transmitted to members

by mail *President*, R G Paulson, Fairmont, Wilford J Schwankl, Sauk Rapids *First Vice-President*, Jesse B Slocumb, St Paul, William Shepard, Minneapolis *Second Vice President*, Orlando Didra, Waseca, Margaret Armitage, Princeton *Thrd Vice-President* L M Herbert, Worthington, Guy Hovland Dawson *Secretary*, A Roy F Johnson, Minneapolis, Harry J Anderson, North Branch *Treasurer*, C T Heller Jr, St Paul, B J Witte, Jr, Anoka *Executive Committee* Joseph Vadheim, Tyler, H O Tiegen, Moorhead

LEGAL AND LEGISLATIVE.

PROFESSIONAL EMPLOYEES

Professional persons in the retail trade working unlimited hours are entitled to the same minimum wage classifications as executives working beyond code hours under an amendment to Article V, Section 4 (a) of the retail trade code, approved by the National Industrial Recovery Board, it was announced January 3rd

Article V, Section 4 (c) of the code provides that executives who work unlimited hours must receive minimum wages ranging from \$25 00 to \$35 00 a week, according to population of the communities in which a retail establishment is located

The term "professional person" is defined in the code. It includes, but without limitation, such employees as doctors, dentists, nurses, architects, training directors, artists, research technicians, statisticians, mechanical engineers, etc

CODE AUTHORITIES GRANTED EXEMPTION FROM INCOME TAX

Under a ruling of the Commissioner of Internal Revenue announced March 13, code authorities are entitled to exemption from Federal Income taxes and from filing returns therefor

They are required, however, to file with the Collector of Internal Revenue in their district an affidavit in the form required by Article 101-1 of Regulation 86 of the Bureau of Internal Revenue, setting forth the character of the organization, the purpose for which organized, its activities, the sources and disposition of its income, whether any of its income is credited to surplus or may inure to the benefit of any private individual and all other general facts

relating to its operations which bear upon its right to exemption as a non profit entity

The exemption does not extend to members or employees of code authorities as individuals

POSTPONE EFFECTIVE DATE OF ORDER RESTORING SALES OF TOILET SOAP TO RETAIL CODE JURISDICTION

The National Industrial Recovery Board on March 12th, announced that the effective date of the order making sales of toilet soap again subject to the retail drug code loss limitation provision has been extended to April 5, 1935

Sales of toilet soap were placed under a loss limitation provision similar to that of the retail food and grocery trade code (cost plus 6 per cent), but an order approved February 19th, effective in 21 days, was issued to restore such sales to the retail drug trade code provision. Considerable confusion has arisen, however, and it has been deemed advisable to prepare an order suspending the loss limitation provision of the retail drug code in so far as toilet soap sales are concerned

In order to permit a decision on such an order, the effective date of the February 19th order has been extended to April 5th

SALES TAX

Texas and Kansas oppose a sales tax. New York, Michigan, Colorado, West Virginia, South Dakota, Washington, California, Wyoming, Montana, Maine and Connecticut have sales tax provisions. Arkansas, Tennessee, Massachusetts, New Jersey, Indiana, Wisconsin are considering measures. The West Virginia law expires July 1st, but the Governor has been asked to extend the time (Texas is now considering a sales tax)

HEARINGS ON THE COPELAND BILL

Hearings were held on the Copeland Bill S 5 (Committee Print No 3) March 2nd and 8th, before members of the Sub Committee of the Committee on Commerce of the Senate of the United States Senator Clark of Missouri, *Chairman*

Representatives of interested associations and organizations attended and about seventy witnesses were scheduled for the hearings. There was some heated discussion and differences of opinion obtained evidencing deep interest—it proves what Dr Carl L Alsberg stated several years ago that "In appraising legislation intended to protect public health or prevent fraud, it is not enough to inquire whether the abuses aimed at are likely to be cured. Political and social consequences need to be envisaged also."

No effort is made to submit opinions on what the Food and Drugs Act should be nor analyze the testimony given. The committee heard many views and, perhaps, enough for reaching conclusions as to what form the presentation in Congress should take. When the measure comes up for action there will, probably, not be unanimity but compromise on some of the stronger contentions. There are some differences of opinion among those to whom the law applies and also among those who frame it and enact the measure.

ARKANSAS

The Arkansas Legislature has passed a bill to prohibit the sale of barbituric acid or derivatives and compounds thereof under any copyrighted or chemical names, except to wholesale drug houses, chemical houses and dispensing pharmacies or practicing physicians, providing that these may not be dispensed except by a practicing physician or retail pharmacy on prescription written by a physician.

IDAHO

Idaho pharmacists are making a determined effort to put pharmacy's affairs again in the hands of pharmacy. A new pharmacy bill (H B 67) takes pharmacy control out of the Department of Law Enforcement under which it has been for many years and puts control in the hands of a state board of pharmacy. This bill passed the house by a vote of 51 to 6 and is said to have the approval of the Governor. This bill will, if passed, create an entirely new set-up for pharmacy in Idaho. It provides that the new board of pharmacy shall be

elected by the state association which will then meet in Boise in June to elect members to the new board and interpret the other provisions of the law for the benefit of Idaho druggists.

MARYLAND

Three bills regulating the drug industry were considered by the Hygiene Committee and referred to the House of Delegates on March 8th.

One measure provides that the United States Pharmacopœia and the National Formulary shall be on file at all times in every pharmacy, that every registered drug store keep a certain minimum of utensils and maintain sanitary standards, that prescription records be filed and that all medicines and drugs be open for inspection at all times wherever they are manufactured or sold.

Another requires that all pharmacies and manufacturers of drugs, medicines, dentifrices, toilet articles and cosmetics shall secure permits from the Maryland Board of Pharmacy.

The third measure would regulate the sale of barbital compounds by making their sale legal only on prescription.

MINNESOTA

A Minnesota bill provides for the regulation of the practice of pharmacy—the sale of drugs, medicines, chemicals, poisons, the establishment of a State board of pharmacy and defining its powers and duties, requirements for registration, licensing pharmacies and pharmacists, etc.

OREGON

The new Oregon pharmacy law is patterned largely after the model pharmacy law sponsored by the National Association of Boards of Pharmacy. It gives more power to the state board in its regulation of pharmacy, provides for registration of all pharmacies with an annual registration fee of \$3 00, provides for elimination, after a few years, of the assistant classification, governs more strictly the sale of poisons and of denatured alcohol, sets up a license for non pharmacy outlets who sell medicinal products, restricts use of such words as "drugs," "druggist," "pharmacy," etc., on signs and in advertising to stores where registered pharmacists are employed, sets new fees for registration by examination or reciprocity and provides certain library and equipment requirements for pharmacies. These are a few of the more important new provisions.

(Continued on page 255)

PHARMACEUTICAL ABSTRACTS

EDITOR A G DuMEZ, 32 S Greene Street Baltimore, Maryland

ABSTRACTORS

WILLIAM B BAKER
GERSTON BRUCH
ARTHUR H BRYAN
HENRY M BURLAGE
ALBERT H CLARK
ZADA M COOPER
GUSTAV E C WALINA
AMELIA DeDOMINICIS
MELVIN F W DUNKER
PERRY A FOOTE
RALPH R FORAN
SAMUEL W GOLDSTEIN
CASIMER T ICHNIOWSKI
ROLAND E KREMERS
CLIFFORD S LEONARD

L LAVAN MANCHEY
ARTHUR E MEYER
E C L MILLER
A PAPINEAU COUTURE
BERTRAN S ROBERTS
HARRY ROSEN
A S SCHWARTZMAN
EMANUEL V SHULMAN
EDGAR B STARKEY
MARVIN R THOMPSON
E G VANDEN BOSCHE
GLENN S WEILAND
ELMER H WIRTH
THOMAS G WRIGHT
MAX M ZERVITZ

The following abstracts, prepared from articles of pharmaceutical interest appearing in pharmaceutical and other scientific or professional periodicals, are intended to replace the abstracts heretofore published in the annual report of the Reporter on the Progress of Pharmacy and carried in the YEAR BOOK. This work is a new venture on the part of the ASSOCIATION and is still in the formative period. We do not as yet receive all of the journals that we desire to abstract, nor do we have a full staff of abstractors. We expect, however, to make up these deficiencies as time goes on to the end that all periodicals of pharmaceutical importance may be brought within the scope of this work.

The pages carrying these abstracts are numbered beginning with 1 the purpose being to permit those who desire to do so to bind them with the ASSOCIATION data and membership rolls which will be printed later, and thus continue the present series of YEAR BOOKS.

A G DuMEZ

March 12, 1935

BACTERIOLOGY

Bacteria—Growth of, in Organic Acid Media The author, using *B. pyocyaneus*, *B. Atertrycke*, *B. paratyphosus* B and *B. bronchosepticus*, finds with the acids used that in general unsubstituted organic acids of odd numbers of carbon atoms do not support bacterial growth and those of even numbers do, while the hydroxy and amino acids of even numbers of carbon atoms do not support bacterial growth and those of odd numbers do —W F BRUCE *J Am Chem Soc*, 57 (1935), 382 (E B S)

Cholera—Treatment of, with New Anti-cholera Serum A toxin prepared from an 18 hour broth culture by filtration, was injected into horses in doses up to 500 cc. The purified concentrated serum obtained after the immunization process had a titer of 1 in 12,000 of H agglutinin and 1 in 1600 of O agglutinin. Intraperitoneal administration was found to be more effective than subcutaneous or intravenous injection. The latter part of the experiments was carried out using 30–40 cc. of serum diluted with 200 cc. of saline, injections being made intraperitoneally. The following results were obtained. In 211 control cases and 128 cases treated with serum the per cent of deaths was 34.1 and 20.2, respectively. With 57 control cases and 32 cases treated with 30–40 cc. of serum the deaths were 26.3 per cent and 12.5 per cent, respectively. The work will be continued —H GHOSH *Brit Med J*, 1 (1935), 56 (S W G)

Disinfectants—Laboratory Testing of The conditions governing disinfectant action include the concentration of the disinfectant, the time of application, the temperature, the number of bacteria, the nature of bacteria and the presence of other materials with which the disinfectant may act. In the Chick Martin test the author recommends the use of a suspension of yeast to supply the organic matter necessary. The author suggests that the different types of surgical disinfectants may be classified in groups, and each group should have its particular standard. Determination of the toxicity of disinfectants may be made by subcutaneous, oral or intravenous routes. The author suggests that the route should be standardized —L P GARROD *Brit Med J*, 1 (1935), 5 (S W G)

Disinfecting Agent—Hints for Use of The article includes a table of some chemical disinfectants and the strengths in which they should be used for certain purposes. Some other disinfectants are also discussed as to their effectiveness and use. The use of metal tanks of a type illustrated in the article is suggested for the disinfection with an inflammable material of rooms which cannot be completely closed. Disinfection after cases of certain special diseases is then taken up —THOMANN *Schweiz Apoth-Ztg*, 73 (1935), 54 (M F W D)

Gonococcus Filtrate (Corbus-Ferry)—Experience with in Treatment of Gonorrhea Evidence based on the use of Gonococcus Filtrate (Corbus Ferry) intradermally in 124 cases of gonorrhea shows this antigen to be of definite value both in the diagnosis and treatment of this disease. Impressively satisfactory results were obtained with the antigen alone and also when used in conjunction with the usual therapy —R E CUMMING and R A BURHANS *J Am Med Assoc*, 104 (1935), 181 (M R T)

Pneumococci—Use of Sodium Desoxycholate for Identification of Two drops of a 10% water solution of sodium desoxycholate are added to 1 cc. of pneumococcus culture. The culture becomes perfectly clear in from 2 to 5 minutes. The pH of the culture to be tested must not be below 6.5 or the desoxycholate will precipitate. The test is carried out at a temperature below 50° C. The author states that he has never found any streptococci which would dissolve, or any pneumococci which failed to dissolve, in the sodium desoxycholate solution —E LERFSON *J Am Med Assoc*, 104 (1935), 213 (M R T)

Pneumococcus—Oral Immunization of Human Beings against A report on antibody formation following the oral administration of pneumococcus vaccines. Original reference given —V ROSS *Clin Med & Surg*, 42 (1935), 92 (B S R)

BOTANY

Rhubarbs—Investigations on Cultivated The rhizomes of *Rheum officinale* and of *R. palmatum*, cultivated for 2 years at Pavia, contain 1 per cent of anthraquinone derivatives, which is appreciably lower than is found in rhizomes of Asiatic origin. It has been observed that the roots are higher in anthraquinone derivatives than the rhizomes. Cultivation of the most highly prized rhubarbs does not, therefore, seem to produce in the rhizomes the chemical characteristics inherent to those of Asiatic rhubarbs, to which are generally attributed the therapeutic activity.

of rhubarb, and hence the preference shown in the pharmacopœia for the Asiatic product is justified —P MARANGONI *Scienza farm*, 2 (1934), 13, *Chimie et industrie*, 32, 1934, 634, through *Chem Abstracts*, 29 (1935), 888

CHEMISTRY

GENERAL AND PHYSICAL

Centrifugal Force—Nomogram for In designating results involving the use of a centrifugal machine, the force as compared with gravity (relative centrifugal force) should be specified rather than the number of revolutions per minute, which affords but slight notion of the centrifugal stress to which the material has been subjected Centrifugal force, C (in dynes), is given by the relation $C = 4\pi^2 n^2 r$, where n is the number of revolutions per second and r is the radius in centimeters C is divided by 980 to obtain the relative centrifugal force, compared with gravity For ready calculation of centrifugal force, a convenient nomogram is given —H SHAPIRO *Ind Eng Chem, Anal Edit*, 7 (1935), 25 (E G V)

Glycol-Water Mixtures—Relation of Vapor Pressure and Boiling Point to the Composition of The glycol water system was investigated from 0 to 100 per cent glycol and up to atmospheric pressure The boiling point pressure relations are given in the form of the Young equation The mixtures obey Raoult's law fairly closely —H M TRIMBLE and W PORTS *Ind Eng Chem*, 27 (1935), 66 (E G V)

INORGANIC

Hydrogen—Heavy A brief review of heavy hydrogen and a comparison of some of its properties with properties of ordinary hydrogen —E B LUDLAM *Pharm J*, 134 (1935), 88 (W B B)

Magnesium Perchlorate ("Anhydron")—Value of, as Drying Agent Anhydrous magnesium perchlorate which may be prepared by heating the hydrated forms to 200–250° C for a few hours, has been found to be as good as phosphorus pentoxide as a drying agent and for absorbing water The perchlorate is easier to handle than phosphorus pentoxide and may be recovered by heating —J G F DRUCE *J Soc Chem Ind* 54 (1935) 54 (S W G)

ORGANIC

Alkaloids

Morphine Series—Reduction Studies in V Dihydro- and Tetrahydro-Pseudocodeine Methyl Ethers A suspension of 5 Gm of pseudocodeine methyl ether hydrochloride in 50 cc of glacial acetic acid, when hydrogenated in the presence of platinum oxide gave 3.7 Gm of dihydropseudocodeine-A-methyl ether, and 0.7 Gm of the tetrahydro compound The alcoholic methoxy group was not eliminated When pseudocodeine methyl ether was reduced with sodium in absolute alcohol, dihydropseudocodeine-C-methyl ether resulted The methiodide of dihydropseudocodeine-A-methyl ether, when degraded with 25 per cent sodium hydroxide gave dihydro ϵ -methylmorphumethine A-methyl ether which on hydrogenation in 7.5 per cent acetic acid with platinum oxide, gave the tetrahydro compound The methiodide of dihydropseudocodeine-C-methyl ether, when treated with the calculated amount of thallous hydroxide, yielded dihydro ϵ -methylmorphumethine C-methyl ether, which on hydrogenation in 10 per cent acetic acid with platinum oxide yielded the hexahydro ϵ -methylmorphumethine methyl ether Analysis and physical properties of the compounds and certain of their derivatives are given —L SMALL and R E LUTZ *J Am Chem Soc*, 57 (1935), 361 (E B S)

Morphine Series—Reduction Studies in VI Hydrogenation of Alpha- and Beta-Isomorphines Alpha-isomorphine was hydrogenated in alcohol with palladium barium sulphate to dihydro- α isomorphine, and this product on methylation with diazomethane gave dihydroisocodeine The compound and certain derivatives were analyzed and identified Beta isomorphine on hydrogenation in ethanol, using platinum oxide catalyst yielded tetrahydro β isomorphine and when hydrogenated in acetic or hydrochloric acid, yielded a mixture of the dihydro and tetrahydro bases These on methylation yielded dihydro- and tetrahydroallopseudocodeine respectively —L SMALL and B F FARIS *J Am Chem Soc* 57 (1935), 364 (E B S)

Essential Oils and Related Products

Achillea Millefolium Linné—Volatile Oil of The following constants were obtained on some oil obtained by steam distillation from a crop grown at the Pharmaceutical Experiment station at the University of Wisconsin. All figures are at 25° C. Specific gravity 0.9066, Refractive Index, 1.4703, Specific Rotation, $[\alpha]_D = -14.11$ —R. L. McMURRAY *Am. J. Pharm.*, 107 (1935), 33 (R. R. F.)

"Cedro" Wood Oil—Brazilian "Cedro" are trees belonging to the N. O. Meliaceae, genus *Cedrela*, the most common species being *C. odorata* L., *C. angustifolia* D. C., *C. montana* Karst., *C. macrocarpa* Ducke, *C. fissilis* Vell., *C. australis* Juss., St. Hil., *C. glaziovii* D. C., their frequency in the virgin forests corresponds to the order in which their scientific names are given here. Roots, chips, sawdust, leaves and the fruit capsules are used in the extraction of essential oil, the yield covers a wide range according to the soil conditions, the age and the state of health of the individuals, and to the part of the tree explored. Only old and very strong individuals deliver the extractable material. Results obtained when different lots of raw material were subjected to steam distillation in small vessels under laboratory exactness are tabulated. The essential oil from any one of the mentioned Cedro species is very frequently employed as a specific remedy against psoriasis and erysipelas, also herpetic affections are stated to retrocede after an extended external medication. For the application the oil is incorporated into some animal fat. The writer and his assistants have experienced erythematous phenomena on their own skins after handling essential oils of any of the mentioned species. Other applications of the oil are also given—F. W. FREISE *Perf. and Ess. Oil Rec.*, 26 (1935), 11 (A. C. DeD.)

Peppermint Oil—Report on, from Cyprus The characteristics of oils distilled from the black and the white varieties of peppermint were $d_{15}^{15} 0.9137-0.9299$, $0.9182-0.9228$, $[\alpha]_D^{18} -20.75^\circ$ to -10.84° to -30.3° , $n_D^{20} 1.4630-1.4634$, $1.4642-1.4660$, acid value 0.8-7.6, 0.5-1.2, ester value 25.9-68.2, 29.8-83.1 (equivalent to menthyl acetate 9.2-24.1, 10.5-29.4 per cent), and ester value after acetylation 200.1-228.4, 169.8-202.6 (equivalent to menthol 65.6-76.8, 54.2-66.6 per cent), respectively. The oil from the black variety was soluble in 2.7-3.0 volumes of 70 per cent alcohol at 15.5°, that from the white variety was insoluble in 13 volumes of 70 per cent alcohol but was soluble in 1.2 volumes of 80 per cent alcohol at 15.5°—*Cyprus Agr. J.* 27 (1932), 56, 28 (1933), 39, through *Chem. Abstracts*, 29 (1935), 292.

Terpenes—Biogenesis of Some The manner in which certain changes in terpene molecules and precursors of terpenes may occur is postulated. Structural formulas are given—J. WALKER *J. Soc. Chem. Ind.*, 54 (1935), 55 (S. W. G.)

Turpentine—Chios The history of the drug is traced to earliest writings. A botanical description of the drug is given in full with habitat, etc., along with characteristics of the fruit and resin and uses of the plant. A survey of the literature in regard to the chemical constitution is included. A detailed study of the resin is undertaken. The resin was treated with ether, 7.83 per cent being insoluble, the ether solution was then shaken out with 1 per cent solution of ammonium carbonate and the terminthol acid separated with acid and studied. A second treatment of the ether extract with another alkali solution and then acid removed two acids which were soluble in alcohol. This solution on treatment with alcoholic solution of lead acetate gave an alcohol insoluble lead salt of terminthin acid and an alcohol soluble lead salt of terminthol acid each of which was studied. The ethereal extract on further treatment with alkali and acid yielded terminthol acid. The ethereal extract was distilled, the volatile oil was then steam distilled, salted out, the ether distilled off and the oil studied. On steam distillation of the oil a resin remained behind. A bitter principle was also separated. On dry distillation of the resin, water, a volatile oil and several empyreumatic products were obtained—E. EMMANUEL *Pharm. Acta Helv.*, 10 (1935), 12 (M. F. W. D.)

Fixed Oils, Fats and Waxes

Croton Resin—III Combined Acids The resin was saponified with 1.6*N* alcoholic potassium hydroxide in an atmosphere of nitrogen. Thirty-two per cent of the saponification products were petroleum ether soluble fatty acids. The acids identified were taglic, caprylic, capric, lauric, myristic, palmitic, oleic and linoleic—N. L. DRAKE and J. R. SPIES *J. Am. Chem. Soc.*, 57 (1935), 184 (E. B. S.)

Halibut Liver Oil Factors affecting the production of this oil are (1) origin of the fish geographically and (2) the process of extraction and refinement. It appears as if the viscosity of the oil is related to the amount of vitamin A present as those with high concentrations are very viscous. In order to meet prevailing specifications of free fatty acids (max 1.41%), it is necessary to neutralize and remove these acids, which treatment causes considerable variation in the constants for the oil. The potency of the oil depends on (1) the age of the fish, (2) the season of the year, and (3) the spawning cycle and food (probably) and ranges from 30 000 International Units per Gm vitamin A to 160 000–175 000, vitamin content is generally 2000–3000 units per 100 000 units of A. Most of the oil is more potent than the standard now observed and that from the Pacific Coast is twice the 44 800 new U S P Units now recognized. Preferable diluents appear to be corn germ, wheat germ and cottonseed oil and it may be fortified by the addition of viosterol or natural Vitamin D and the addition of other potent oils as swordfish liver oil and tuna oil. Combinations of the oil with other medicaments are mentioned.—H F TAYLOR *Drug and Cosmetic Ind.*, 35 (1934), 603–685, 36 (1935) 149 (H M B)

Olive Oil—Occurrence of Unsaturated Hydrocarbon in The authors of this paper have made a thorough study of an unsaponifiable fraction contained in olive oil using an authentic product of Palestine origin. They prepared their material by saponifying the oil in the usual manner, extracting the unsaponifiable portion with ether, purifying it in two ways: fractional crystallization from hot ethyl alcohol and selective adsorption. The latter method was the most satisfactory. The unsaponifiable matter was dissolved in a mixture of 90% petroleum spirit and 10% benzene and passed through a column of Merck's specially purified aluminum trioxide. Four colored zones appeared and these were separated and with the filtrate passing through, examined separately. A spectroscopic examination showed clearly the presence of ergosterol in some of the adsorption bands. The filtrate contained a colorless and odorless mobile oil from which there separated on chilling a small amount of crystalline wax having no iodine absorption value. Analysis of the liquid portion showed it to be unsaturated and of the squalene type containing traces of other things, some of them containing oxygen. Distillation under reduced pressure resulted in a more highly purified fraction. Elementary analysis was made of this purified fraction and the results indicated very clearly that the fraction was almost pure squalene. Both the hydrochloride and the hydrobromide prepared from it when compared with the derivatives from pure squalene showed very close microscopic resemblances. It was further found that the hydrochloride of squalene could be prepared directly from the oil but the yield was not very good. Other samples of olive oil were examined and also one of tea seed oil. The olive oils all contained the hydrocarbon but the tea seed oil did not. A table comparing various constants of pure squalene and those of the hydrocarbon of the olive oil is given and close agreement is shown in practically every respect.—T THORBJARNARSON and J C DRUMMOND *Analyst*, 60 (1935) 23 (A H C)

Glycosides Ferments and Carbohydrates

Chondrus Crispus—Some Properties of Polysaccharide Complex from A method is described which yields a standard, relatively pure material, largely carbohydrate in nature, with an ash content of approximately 20 per cent of its dry weight representing the gelatinizing constituent of *Chondrus Crispus*. An extract previously described as an ethereal sulphate of calcium is now shown to be a mixture of sulphates, phosphates, etc. Potassium ammonium and calcium salts of the ethereal sulphates occurring *in situ* have been prepared and examined. More than the theoretical quantity, as calculated on Hass' formula, was lost by ashing the standard extract. A modified formula embodying an acid salt is given. Comparison of the chondrus extract with purified agar showed a similarity in physical properties and origin.—M R BUTLER *Biochem J.*, 28 (1934), 759 through *Physiol Abstracts* 19 (1935) 566

Pectins—Survey of Recent Researches on Since pectins have won a considerable place in food industries in recent years and since they have been suggested for certain types of medicaments the author has compiled this review. While it is based primarily on the work of Ehrlich and his co-workers during the past seventeen years it covers the history of the subject to a considerable extent. Structural formulas are given and the chemical discussion is rather complete. The review also enumerates several commercial uses for pectins.—E I VAN ITALLIE *Pharm Weekblad* 72 (1935), 2–25 (E H W)

Saponins—A discussion of the history, properties, distribution in the plant kingdom and in parts of plants, and the function of saponins in plants is given. Chemical properties of saponins and their purification are taken up, as well as a study of their constitution in so far as possible. Consideration is given to means of quantitative estimation of saponins by (1) determination of the amount of froth, (2) the so-called hemolytic index, and (3) toxicity toward fish. All saponin containing drugs are classified into four groups according to their uses: (1) purgative and expectorant drugs, (2) blood purifiers, (3) diuretics, (4) nutrient saponin containing drugs. A few of the uses of saponins in pharmacy and medicine are listed.—K LEUPIN *Pharm Acta Helv*, 10 (1935), 22 (M F W D)

Other Plant Principles

Pterocarpin—Identification of Constituents of Red Sandalwood. According to elementary analysis, the formula for pterocarpin may be either $C_{17}H_{14}O_4$ (proposed by Rast) or $C_{17}H_{14}O_4$. The analysis for the bromine content of monobrompterocarpin corresponds to the formula $C_{17}H_{14}O_4Br$, thus verifying $C_{17}H_{14}O_4$. The monobrom derivative was obtained in the form of colorless needles, melting at 165° . It is suggested that pterocarpin differs from homopterocarpin ($C_{17}H_{14}O_4$) in that it contains a methylene oxide group instead of two methoxyl groups. Pterocarpin gives a positive test for the methylene oxide group by the reaction of Labat, Pictet and Kramers and also the color test of Weber and Tollens. Free hydroxyl groups are not present, since pterocarpin is neither soluble in sodium hydroxide solution nor is it acetylizable. It condenses with difficulty with 2,4 dinitrophenylhydrazine to form dark reddish brown, glistening needles having the formula $C_{23}H_{18}O_8N_4$, m.p. 305° . Pterocarpin contains, in addition to a carbonyl group, an oxygen atom bound in an ether like linkage since reduction results in the formation of phenolic hydroxyl. Fusion with caustic potash converts pterocarpin to resorcin.—H LEONHARDT and K FAY *Arch Pharm*, 273 (1935), 53 (L L M)

Unclassified

5,5-Alkylphenylbarbituric Acids—Synthesis of. The following 5,5 alkylphenylbarbituric acids were synthesized, viz., the ethyl, isopropyl, isoamyl, *n* hexyl and *n* heptyl phenylbarbituric acids. The method was as follows: Phenylacetoneitrile was condensed with diethylcarbonate, using sodamide as the condensing agent in absolutely anhydrous ether and with efficient stirring and refluxing and yielding ethyl cyanophenylacetate. The cyanophenylacetate is alkylated and the resulting cyanoalkylphenylacetate is condensed with urea in ether, alcohol or absolute alcohol in the presence of sodamide or sodium ethylate. The resulting 5,5 alkylphenyl 4 iminobarbituric acid is hydrolyzed in 3.3*N* hydrochloric acid to the 5,5 alkylphenylbarbituric acid. Yield 19.2%. The acids other than luminal are synthesized for the first time by this method and their physical constants and the physical constants of the intermediate products are given. The pharmacological evaluation has not been given.—J S CHAMBERLAIN, J J CHAP, J E DOYLE and L B SPAULDING *J Am Chem Soc*, 57 (1935), 352 (E B S)

Aurothiosulphates of Quinine, Ammonium and Calcium—Preparation and Properties of. Quinine aurothiosulphate is prepared by using a concentrated solution of quinine hydrochloride with sodium aurothiosulphate, and constantly stirring. A white precipitate forms which turns pale yellow. After washing and drying, amorphous pale yellow masses appear with some crystals. The compound is soluble in water at 9° C to the extent of 0.46 Gm. per liter, and at 100° C—24.3 Gm. per liter. It is insoluble in organic solvents, stable in air and at 150° C decomposes slightly. Ammonium aurothiosulphate is obtained by displacing quinine from its aurothiosulphate by ammonium, by treatment with excess ammonium hydroxide. It is a white amorphous solid, very soluble in water, but insoluble in organic solvents and decomposes very easily. Calcium aurothiosulphate is prepared by treatment of calcium hyposulphite and gold chloride. The calcium compound is dissolved out with alcohol, and when purified it is colorless. The compound after twenty four hours contained ten molecules of water, but after four months contained six molecules of water. It is very soluble in water, insoluble in organic solvents and very hygroscopic. Heating to 100° C does not change it, but at 250° C decomposition takes place. *Chemical properties*—They dissolve in dilute acids. Diluted hydrochloric acid causes formation of a sulphate. Diluted sulphuric acid causes formation of colloidal gold. Diluted nitric acid forms sulphur precipitate and sulphurous acid. Other tests and reactions prove Fordos and Gelis' hy-

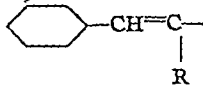
pothesis that gold is monovalent in the compound. Reactions with hydroquinone pyrogallol, potassium permanganate and tannin result in the formation of metallic gold. Reactions with reducing agents were also given.—M M PICON *J pharm et chim*, 21 (1935), 101 (M M Z)

Isobutyl Groups—Introduction of, into Phenols, Cresols and Homologous Compounds The isobutyl derivatives were made by the rearrangement of the methylallyl phenol ether to the corresponding methylallyl phenol, and the catalytic reduction to the isobutyl phenol. Tests showed the isobutyl radical did not enhance the germicidal action of the phenols to as great an extent as did the normal butyl and higher alkyl radicals.—Q R BARTZ, R F MILLER and R ADAMS *J Am Chem Soc*, 57 (1935), 371 (E B S)

Phenols—Molecular Compounds of A series of molecular compounds formed by cineole and *m* 5 xyldine with different phenols is given. The molecular proportions and melting points are tabulated.—G T MORGAN and A E J PETTET *J Soc Chem Ind*, 54 (1935), 22T (S W G)

Tartrates and Racemates The various crystal forms of tartrates and racemates are reviewed and illustrated. A structural formula is given to explain the unusual behavior of some of the compounds.—T M LOWRY *J Soc Chem Ind*, 54 (1935), 28 (S W G)

Tetrahydronaphthalene Peroxide—Preparation of Satisfactory yields of this article by the oxidation of tetrahydronaphthalene (tetralin) are obtained only by aspirating air through the tetralin for a period of about 45 hours. It was found that the best solvent for the recrystallization of tetralin peroxide was a mixture of 22 cc, ethyl acetate and 70 cc of petroleum ether for each 70 Gm of the peroxide. The product recrystallized three times from this solvent mixture melted at 56° C.—W NUSSLE, JR, G W PERKINS and G TOENNIES *Am J Pharm* 107 (1935), 29 (R R F)

Urethanes—Study of a New Series of Report is made of a study of two urethanes 2-methyl cinnamyl urethane and 2 amyl cinnamyl urethane. Details of experimental work are given. Both were found to be inactive as hypnotics. Since urethanes in general are not rapidly hydrolyzed in the animal organism the conclusion was that there was no hypnotic activity in the  grouping or that the urethanes are not readily absorbed, probably the

latter since the corresponding amides are active.—W A LOTT and W G CHRISTIANSEN *J Am Pharm Assoc*, 24 (1935), 22 (Z M C)

BIOCHEMISTRY

Enzyme Activity—Effect of Certain Salts on The toxicity of sodium salts of selenium, vanadium, arsenic and tellurium toward the production of carbon dioxide during yeast fermentation of glucose is in the order named. Sulphur shows some acceleration, depending on the form used, and probably is in direct correlation with the hydrogen sulphide concentration. The toxicity of the sodium salts of selenite, selenide and selenate decreases in the order named. An accelerating effect is shown by sodium sulphide and, to a lesser degree, by sulphite. The sulphate shows a slight retarding effect. Sodium sulphide counteracts the toxic effects of selenium considerably. Elemental sulphur has no accelerating effect and only slightly counteracts the toxic effects of selenium even in the ratio of 20 to 1. Sodium sulphide, ammonium sulphate and sodium thiosulphate are also unable to counteract the toxic effect of selenium.—A L MOXON and K W FRANKE *Ind Eng Chem*, 27 (1935), 77 (E G V)

Gonadotrophic and Estrogenic Principles—Occurrence of, in Myoma of Uterus Assay of a human uterine fibroid showed the tissue to contain 4½ rat units of follicle stimulating and luteinizing factors per Gm of desiccated tissue. The extract gave both effects. The estrogenic assay of this material revealed 4 units per Gm of tissue or 1800 units per pound. The history of the patient from whom the fibroid was removed is given.—D LEWIS and C F GESCHICKTER *J Am Med Assoc*, 104 (1935), 45 (M R T)

Male Sex Hormone—Extraction of, from Urine Urine is acidified with hydrochloric acid, heated to 80° C for 5 hours, cooled, mixed with milk of lime, and filtered. The filtrate is treated with soda ash and filtered. The filtrate is extracted with benzene in a continuous extraction apparatus, of which a diagram is given. Benzene extracts fewer impurities than chloro-

form—Y WANG and H WU *Chin J Physiol*, 8 (1934), 209, through *Physiol Abstracts*, 19 (1935), 672

Oestrin and Luteohormone A review of the methods of assay, the isolation method and the structural chemistry of oestrin and the lutean hormone—K PEDERSEN-BJERGAARD and B KONSTANTIN HANSEN *Dansk Tids Farm* 9 (1935), 29 (C S L)

Vitamin C in Bulk References are made to the method of Szent Gyorgyi for preparing pure vitamin C in large quantities from certain peppers of the genus capsicum, to the possibility of a test for latent scurvy or prescurvy by estimation of the vitamin C content of the urine, and to the synthesis of l-ascorbic acid or active vitamin C The vitamin C excreted by the urine varies according to the vitamin C reserves or 'saturation' of the person tested—*Lancet*, 1 (1935), 100 (B S R)

ANALYTICAL

Aconitine—Detection of, in Aconite Root A tentative method was adopted The sample is macerated with water and extracted with ether in the presence of ammonium hydroxide The washed ether layer is extracted with 0.02N sulphuric acid until acid to methyl red The acid aqueous layer is treated with 5% sodium carbonate solution, heated to 60°, cooled and examined for crystals—*J Assoc Official Agr Chem*, 18 (1935), 84 (G S W)

Aldehydes and Ketones—Improved Hydroxylamine Method for Determination of Displacement of Oxime Equilibria by Means of Pyridine A 0.5N solution of hydroxylamine is prepared by dissolving 35 Gm of hydroxylamine hydrochloride in 160 cc of distilled water and diluting to one liter with 95 per cent ethanol A solution of 20 cc of pyridine and 0.25 cc of 4 per cent alcoholic bromphenol blue indicator is made up to 1 liter with 95 per cent ethanol A standardized 0.5N sodium hydroxide solution in methanol is used for acidimetry Thirty cc of hydroxylamine hydrochloride reagent and 100 cc of the pyridine bromphenol blue solution are run into a 300 cc citrate of magnesia bottle The weighed or measured sample (never equivalent to more than 1/3 of the reagent) is added The bottle is capped and allowed to stand at room temperature or heated in a steam bath The time necessary depends upon the aldehyde or ketone and a table of optimum times is given for about 30 compounds In most cases two hours' heating is sufficient A blank for use as a color standard is run for each set of determinations The pyridine hydrochloride in the reaction mixture is then titrated until the indicator color matches the blank Precautions to be used are given and the effects of groups adjacent to the carbonyl group are discussed Results were within plus or minus 1 per cent of the theoretical—W M D BRYANT and D M SMITH *J Am Chem Soc* 57 (1935), 57 (E B S)

Amidopyrine and Dinitrophenol (2,4)—Detection of Tentative microchemical methods were adopted Crystals are obtained from a water solution of amidopyrine by the addition of either mercuric chloride (5 Gm in 100 cc of water) or Marme's solution (3 Gm of cadmium iodide in 18 cc of water containing 6 Gm of potassium iodide) A solution of dinitrophenol in sodium hydroxide (0.1N), acidified with 1% hydrochloric acid produces characteristic crystals Comparisons are made against controls Descriptions of the crystals are given—*J Assoc Official Agr Chem*, 18 (1935), 86 (G S W)

Anesthetics—Special Detection of Cocaine and Novocaine, with Reference to Smuggled Goods The Zwikker reagent for Cardiazol (*Pharm Weekblad*, Oct 20, 1934), cuprous chloride (CuCl) has been adapted as a microchemical reagent giving the following reactions with anesthetics with Aconine—no reaction, with Allylcocaine nitrate—a compact mass of yellow rosettes of needles, with Aल्पine—yellow parallelograms which disappear rapidly, with Anesthesin hydrochloride—large yellow plates, sometimes branching, with Buteline—a yellow undifferentiated mass, with Cocaine hydrochloride—lemon-yellow fine feathery rosettes beginning thread like but increasing in thickness, Cycloform—green fine rosettes of needles, Diocaine—no reaction, Eucaine A—light yellow rosettes with outward pencil like branching forms, Eucaine B—no particular reaction, Holocaine—no reaction, Larocaine—a clear yellow liquefying mass, Novocaine—yellow very small thin needles sometimes grouped in crosses, but yet so soluble that a good result is only obtained by placing the preparation in a desiccator Differentiation from cocaine hydrochloride is obvious This is one of the reactions in which cocaine hydrochloride reacts quickly and satisfactorily while novocaine gives as good as no reaction Nycaine—beautiful emerald-green, three-sided columns with oblique ends The most beautiful reaction with this

reagent Orthoform—several variable forms, long needles (possibly the reagent) light yellowish green columns and four-sided crystals of the sulphite, Orthoform New—gray green needles usually in large rosettes, Pantocaine—a hygroscopic yellowish mass in which no characteristic forms appear, Percaine—lemon yellow rosettes not characteristic, Propaesine—many crystals but none which can be described as characteristic Psicaine—bluish gray plates mostly four-sided The only material which gives this color Psicaine New hydrochloride—yellow columns with oblique ends, Stovaine—greenish yellow columns with chisel like ends, Subcutine—dirty brown large forked plate-like needles, Tropocaine—green elongated needles which tend to group in rosettes, emerald-green parallelograms not however resembling those obtained with nycaine, were also obtained, Tutocaine—yellowish golden mass without characteristic form Photomicrographs of some of the crystals are given Since cocaine often occurs with other anesthetics especially in illegal goods the authors attempt to devise methods for its detection in the following combinations Anesthesine Cocaine Eucaine A or B Cocaine, Larocaine Cocaine Pantocaine-Cocaine, Percaine Cocaine, Stovaine-Cocaine Subcutine-Cocaine and Tutocaine Cocaine Recent literature is reviewed and several methods of separation (i.e. solvents, etc.) and identification (PtCl₄, Picric acid etc.) are discussed The paper is to be continued—C OFFERHAUS and C G BAERT *Pharm Weekblad* 72 (1935), 82 (E H W)

Aromatic Waters—Distillation of, for Determination of Volatile Constituent The apparatus consists of a 1-liter steam-generating Pyrex flask surmounted by a wide-neck 2 liter separator connected to a vertical condenser An air inlet is provided in the steam generator flask to avoid the building up of excessive pressure After complete removal of the volatile matter, the aromatic principles are extracted with ether in presence of sodium chloride, the solution is dried with calcium chloride, the bulk of the solvent is evaporated on a water bath and the last traces under high vacuum at 22–24°—A GUILLAUME and MME ADNOT *Documentation sci* No 23 (1934) 84, *Chimie and industrie* 32, 644 through *Chem Abstracts*, 29 (1935) 886

Barbitals—Titration of, with Silver Nitrate The author described the method of Budde in which a molecular quantity of the barbitol is dissolved in a solution of one gram of anhydrous sodium carbonate in 30 Gm of water and titrated with N/10 silver nitrate The end-point is reached when a slight milky cloudiness appears This method is preferred to the alkalimetric method since no indicator is necessary and the end point is sharp The author finds that the pharmacopoeial method and the silver nitrate method may be combined He substitutes N/10 sulphuric acid for N/10 hydrochloric acid, uses only a small amount of indicator and when the end point is reached adds an additional 10 Gm of water and 1 Gm of anhydrous sodium carbonate and continues with the silver nitrate titration He gives the following results

		Cc N/10 Alkal		Cc N/10 AgNO ₃	
Luminal verum	232 mg	9 7		9 5	9 8
Dial verum	208 mg	9 6		10 0	
Luminal loco	232 mg	9 7		9 7	9 9 10 2
Dial loco	232 mg	9 8	10 0	10 0	10 0
		Cc N/10 H ₂ SO ₄		Cc N/10 AgNO ₃	
Medinal loco	206 mg	9 4		10 7	

J M A HEGLAND *Pharm Weekblad* 72 (1935) 128

(E H W)

Benzaldehyde—Determination of Small Quantities of Chlorine in Commercial For this purpose a modification of the Schummel and Company method is recommended (*Bericht der Schummel and Co* 1919–1926) Details of the method are as follows the lamp used being a Richardson Lamp as described in *J Inst Pet Tech* 7 (1921) 26 'The two rolls of silver gauze A (to free incoming air from chlorine), and B (to collect chlorine in the oil) are first cleaned by immersion in ammonia solution (sp gr 0.880), washed with water dried and gently heated in a flame They are then slid into silica tubes (in which they fit tightly) being followed by asbestos plugs and finally by rubber stoppers The lamp is filled with benzaldehyde, the wick (not glass capillaries) is adjusted to give a small flame and the whole is weighed The rest of the Richardson apparatus is connected (without the usual absorption tube) with the silica tubes placed side by side in iron gauze shields These tubes are heated to dull redness before the apparatus is connected with the suction pump The lighted lamp is then slid into position the air-flow is adjusted to give a small non-smoky flame and the shield is slipped down on to the mercury seal The

benzaldehyde is thus burning in a chlorine free stream of air, and the products of combustion are freed from chlorine by the hot silver gauze, B. When sufficient benzaldehyde has been burnt (this depending upon the expected chlorine content) the lamp is removed and re weighed. When cool, the tube with gauze, B, is disconnected, the ends, inside and outside, are cleaned, and, without removal of the gauze, placed in a test-tube. Three successive portions of 1.5 cc of ammonia (sp gr 0.880) are dropped on to the gauze, and after this has been left for 10 minutes some 5 cc of water are used for washing the gauze and tube. The dilute ammonia solution is then acidified with a minimum quantity of nitric acid, a few drops of silver nitrate solution are added, and the precipitated silver chloride is left to settle. Coagulation is assisted by the addition of a few drops of ether. The silver chloride is collected in a Gooch crucible, washed first with *N*/100 nitric acid and then with absolute alcohol, dried at 125° C, cooled and weighed. It is then dissolved in ammonia, and the crucible is re weighed. Usually a few tenths of a milligram of carbon remain undissolved. The table showing results on commercial oils and on samples containing known amounts of chlorine and also so called chlorine free oils is given. The method gives excellent results and it is interesting to note that any sample of oil of bitter almonds contains about 0.001% of chlorine.—C. G. DAUBNEY, *Analyst*, 60 (1935), 29 (A. H. C.)

Cane Sugar Content of Small Volumes of Solutions—Determination of, from Specific Gravity and Specific Rotation. The apparatus for the determination of specific gravity consisted of a Kuhlmann micro balance and a glass capillary 6–8 cm long and having a capacity of 5–30 mg of distilled water. Three determinations are made with three different capillaries and the average value is computed. The average error by the micromethod was 1.8 per cent of the sugar content as compared to an error of 1.3 per cent by the macromethod. The values for micro specific gravity determinations are useful in the calculation of specific rotation by micro polarization methods.—R. BEUTLER, *Mikrochem*, 16 (1935), 133 (L. L. M.)

Carbon—Modified Chromic Acid Method for the Determination of. The apparatus consists of a 300 cc Kjeldahl flask, fitted with a combined acid reservoir and air inlet and a large glass double surface condenser. The end of the delivery tube from the condenser is connected to a hard glass combustion tube, 15 in long filled with powdered lead chromate and copper oxide wire, and plugged with copper gauze spirals. The combustion tube is placed within a shorter length of copper or iron piping, giving a good distribution of heat. The gases are led from the combustion tube through an absorption tube containing pumice chips and sufficient concentrated sulphuric acid to form a lock, and following this into a potash bulb with a calcium chloride tube and two soda lime tubes, the first of which also contains calcium chloride. The substance to be examined, sufficient to give 0.5 to 1 Gm of carbon dioxide, is placed in the flask together with potassium dichromate, after sweeping out, sulphuric acid is added and the mixture heated until the reaction is completed.—I. M. ROBERTSON and J. M. SHEWAN, *J Soc Chem Ind*, 54 (1935), 35T (E. G. V.)

Carotenoids—Rapid Quantitative Method for the Determination of the Common Analysis of Beta-Carotene and Leaf Xanthophyll in Thirteen Plant Tissues. A rapid quantitative method for determining carotenoids without separating the components of a plant extract is given. The samples (5 Gm green weight) are macerated with 25 cc of acetone and 25 Gm of quartz sand, the extract decanted into a 250 cc Erlenmeyer flask and 2 cc of 95% ethanol saturated with potassium hydroxide is added. This is separated three times with acetone and twice with 35 cc portions of ether. The pulp and sand are transferred to a Soxhlet extractor and extracted 30 to 60 minutes with ether. This extract contained 30 γ or less of carotenoids. The combined extracts are transferred to a 3 liter separatory funnel containing 1.5 liters of distilled water whirled gently and allowed to separate for five minutes. The aqueous layer is drained into a second separatory funnel. The contents of the second separatory funnel are extracted with 100 cc of ether and the ether washings added to the first funnel. The ether extracts are washed four times with 500-cc portions of distilled water and separated. The ether solution is evaporated *in vacuo* in a 500 cc balloon flask to 50–60 cc, transferred to a 100 cc graduate and made up to volume. The solution is analyzed the same day by the spectrophotoelectric method described by Zscheile, Hogness and Young and the analytical procedure devised by Miller.—E. S. MILLER, *J Am Chem Soc*, 57 (1935), 347 (E. B. S.)

Chloride—Modified Volhard Method for the Determination of. To the chloride solution, acidified with nitric acid, there is added 1 cc of nitrobenzene for each 0.05 Gm of

chloride The nitrobenzene, attaching itself to the silver chloride, inhibits the darkening of the latter in light and improves the end-point when back-titrating with potassium thiocyanate—J R CALDWELL and H V MOYER *Ind Eng Chem, Anal Edit*, 7 (1935), 38 (E G V)

Cinchona Bark and Cinchona Decoctions—Alkaloid Content of The Keller-Fromme method of assay (*Pharm Ztg*, 64 (1923), 57) for the alkaloid content of cinchona bark was studied and found to give results which were higher according to the degree of pulverization of the drug The present authors recommend analysis of finely powdered material (Danish Pharmacopœia, sieve No 50) No relationship was found, however, as to the quantity of alkaloid extracted in the process of preparation of simple or acidic cinchona decoctions, whether the drug was of the coarseness to pass sieve No 3 or finer, up to material passing sieve No 50 On fractional sieving different fractions were found to vary in alkaloid content (between 6.83 and 10.30%) even if they were then ground fine before analysis—A JACOBSEN and S A SCHOU *Dansk Tids Farm* 9 (1935), 1 (C S L)

Cocaine—New Falsification of The substance examined was a white powder, which appeared to be cocaine hydrochloride, yet it possessed a melting point of 94° C as compared to a melting point of 186–190° C for pure cocaine hydrochloride A solution of the substance gave general alkaloidal tests similar to cocaine By means of different solubilities in cold distilled water a substance equivalent to one third of the weight of the original amount used was separated The substance did not resemble the common adulterants such as boric acid, sugar, sodium bicarbonate, etc., but appeared to be a hypnotic such as sulphonal It contained no sulphur When it was sublimed an odor of benzoic acid was perceived Further study showed this substance to be ethylpara-aminoethyl benzoate or anesthesine (m p 90° C) Precipitates of cocaine and anesthesine with alkaloidal reagents differ only in dilute solution—E COLLARD *J pharm chim*, 21 (1935), 57 (M M Z)

Copper—Detection and Determination of, in Pharmaceutical Preparations To 2 cc of the solution (approximately 0.1N in hydrochloric acid and with a maximum of 1 mg of iron) are added 50 mg of ammonium fluoride to mask the iron as $(\text{FeF}_6)^{--}$, followed by 1 drop of 5 per cent aqueous zinc sulphate and 0.5 cc of aqueous ammonium mercuric thiocyanate (from 8 Gm of mercuric chloride + 9 Gm of ammonium thiocyanate in 100 cc of water) With a minimum of 5×10^{-6} Gm of copper or cobalt a violet coloration is produced Small amounts of copper were found in various preparations—F FEIGL and P KRUMHOLZ *Sci Pharm*, 5 (1934) 19 through *J Soc Chem Ind*, 54 (1935), 45B

Copper in Milk—Determination of Minute Amounts of A 25- to 200 cc sample of milk, to which 5 drops of glacial acetic acid has been added to prevent foaming, is evaporated over a free flame After most of the carbon is burned the platinum or quartz crucible containing the residue is ashed in a muffle furnace at 565° C for 2 to 3 hours The ash is dissolved in from 1 to 8 cc of 20 per cent hydrochloric acid and the warmed solution is centrifuged at 1800 r p m for 10 minutes to throw down carbon The solution is then neutralized with ammonium hydroxide and hydrochloric acid added to make it 1 per cent after bringing to the 10 cc volume The solution is saturated with hydrogen sulphide, stoppered and allowed to stand over night After centrifuging the copper sulphide is dissolved with 4 drops fuming nitric acid The tube is heated for 10 minutes, then cooled, diluted and ammonium hydroxide is added to give a distinct color, the solution is then made up to 10 cc Any turbidity is removed by centrifuging An aliquot containing from 0.001 to 0.005 mg of copper is taken for the colorimetric estimation with 1 cc of 0.1 per cent sodium diethyldithiocarbamate, the yellow color is compared with a standard The copper content of raw milk was found to average 0.077 parts per million Pasteurized milk and dried milk contain more copper—L W CONN, *et al* *Ind Eng Chem, Anal Edit*, 7 (1935), 15 (E G V)

Copper—Iodometric Determination of The procedure is carried out in the usual manner until most of the iodine is consumed by the standard sodium thiosulphate At this point 0.5 to 1.0 cc of 4 per cent alcoholic solution of white shellac is added slowly while swirling the contents of the flask The precipitate is allowed to settle for 20–30 seconds and the titration completed The shellac solution causes a rapid settling of the turbid precipitate, thus making the end-point more easily observed—J R CALDWELL *J Am Chem Soc*, 57 (1935), 96 (E B S)

Ergotoxine—Determination of, in Ergot A tentative method was adopted The alkaloids are extracted with ether from an ammonium hydroxide solution, washed and extracted with

tartaric acid solution (1%) The ether is removed by evaporation and aliquots treated with dimethylaminobenzaldehyde solution (1.25 Gm of dimethylaminobenzaldehyde per liter in a solution containing 650 cc of sulphuric acid and 0.05 Gm of ferric chloride) The solution is compared in a colorimeter with either ergotoxine ethanesulphonate or ergotamine tartrate as standards Results are expressed as per cent of ergotamine tartrate or ergotoxine ethane sulphonate—*J Assoc Official Agr Chem*, 18 (1935), 88 (G S W)

Essential Oils—Average Values for Surface-Tensions of A table containing the surface tensions of various essential oils determined at 20° C in dynes per centimeter is given—A MÜLLER *Perf and Ess Oil Rec*, 26 (1935), 18 (A C DeD)

Essential Oils—Viscosity Surface Tension, and Capillariscope Behavior of The specific viscosities (η) and surface tensions (γ) of 130 essential oils (including varieties of the same oil) are determined by a dropping method About 86 per cent of the oils investigated have $\eta = 2$ –10 cp, while 70 per cent have $\gamma = 27$ –30 dynes/cm A capillariscope, involving the dropping of the oil on to filter paper is described (cf *A*, 26 (1932), 803) The diameter of the spreading drop is measured at intervals of 5 minutes (up to 60) and results are expressed graphically Various factors determining capillary behavior are discussed—A MÜLLER *J pr Chem*, 141 (1934), 167 through *J Soc Chem Ind* 54 (1935), 46B

Ferrum Reductum—Evaluation of, by the Sublimate Method For testing reduced iron the U S Pharm and Merck's book on testing chemical reagents recommend heating 1 Gm of the iron with 10 Gm of mercuric chloride for 5 minutes and then titrating the resulting ferrous chloride solution with potassium permanganate The results obtained with 10 Gm of mercuric chloride are shown to be too low because of the mercurous chloride enclosing some undissolved iron Higher and more accurate results are obtained by using only 5 Gm of mercuric chloride If it is desired to use more mercuric chloride the sample should be treated first with only 5 Gm and the remainder added only after a preliminary boiling of about 1 minute Instead of mercuric chloride 10 Gm of mercurous chloride can be used for 1 Gm of iron but this has no advantage—L WEISS *Z anal Chem* 98 (1934) 397, through *Chem Abstracts*, 29 (1935), 292

Galactose—Detection of Provoked, in Urine According to Technique of Fiessinger, and Application of Method of Fleury and Marque The authors find that the Baudouin and Levin method as applied by Fleury and Marque is best for the detection of galactose This method involves the purification of the urine with mercuric nitrate by introducing into a 100 cc round flask 5 cc of urine accurately measured, 50 cc of water, 5 cc of mercuric nitrate reagent and 5 cc of normal salt solution The mixture is stirred and diluted to 100 cc with diluted nitric acid This is filtered and 5 to 20 cc of the filtrate is placed in a conical graduate and to it are added successively 3 cc of solution of mercuric iodide 5-cc normal saline solution, 5 cc of a suspension of barium sulphate and water up to 80 cc This mixture is immersed in a boiling water bath for 6 to 8 minutes, then cooled, and 5 cc of 20 per cent sulphuric acid is added The mixture is cooled again, and 5 cc of 0.1N iodine reagent is added After stirring for some time the excess iodine is titrated with 0.1N sodium thiosulphate with the aid of a microburette A coefficient was determined for galactose 1 cc 0.1N iodine equals 5.37-mg galactose—W R HAZARD M HERBAIN and C VAILLE *J pharm chim* 21 (1935), 61 (M M Z)

Graduates—Inaccuracy of Glass The author discusses allowable variation in graduated apparatus and gives tables of results obtained in checking 25 graduates Some show considerable inaccuracy while others are fairly accurate The author concludes that older graduates, which are not mechanically graduated are usually the most accurate He finds that fancy graduates with colored or molded graduations are usually not very accurate and that there is often a variation in accuracy among graduates of the same manufacture—P VAN DER WIELEN *Pharm Weekblad*, 72 (1935) 34 (E H W)

Acacia—Identification Reactions for The ferric chloride borax and alcohol reactions of the Netherlands Pharmacopœia did not give satisfactory reactions, the precipitates dissolving upon shaking Upon increasing the pharmacopœial concentrations five times, ferric chloride gave a gelatinous brown precipitate, 0.100 Gm of borax a gelatinous white precipitate and 5 cc alcohol a white precipitate The identification reaction with basic lead acetate was visible in dilutions of 1:10,000 With the latter reaction the author advises that a blank be run especially if the lead precipitate is not immediately visible It is advised that the following reaction be added to the above 1 drop of hydrogen peroxide (3%) is added to 5 cc of a 5%

solution of the gum to which a trace of benzidine has been added. Within a few minutes the solution will assume the color of benzidine blue. The solutions should be made in the cold so that the peroxidase will not be destroyed through the heat of reaction. The author found that old gums required a greater concentration to give a positive reaction and suggests that the peroxidase content of the gum diminishes with age.—I C RITSEMA *Pharm Weekblad*, 72 (1935) 105 (E H W)

Acacia—Mucilage of, and Detection of Oxidase in Qualitative and quantitative tests for oxidase and peroxidase in mucilage of acacia are reviewed.—M SIDO *Pharm Ztg*, 80 (1935), 12 (G E C)

Henna—Evaluation of Since henna, is used principally for dyeing hair, methods of judging the quality of a sample must have reference to its dyeing properties. The British Pharmaceutical Codex, 1934, describes a test for henna in which white knitting wool is used. The color produced however, does not compare closely with that produced when human hair is used. The best results were obtained by using pure white fine drawn mohair. The procedure is as follows. Weigh out 2 Gm of white mohair and tie into a hank. Wash first in 0.1N borax solution, then in distilled water and finally dry in the steam oven. Take 4 Gm of henna in a No. 60 powder and mix thoroughly with 20 cc of boiling water. Immerse the mohair in the mixture and allow to remain for thirty minutes, after which wash the hank thoroughly and then dry in the steam oven. When dry, press the hank between two microscopic slides and secure them in position by means of rubber bands slipped over the ends. Match the color in the B. D. H. Lovibond tintometer, using the artificial light attachment and by reflected light normal to the surface at 90°.—W A N MARKWELL *Chem and Drugg*, 122 (1935), 157 (T G W)

Homatropine, Hyoscyamine, Scopolamine—Detection of Tentative microchemical methods were adopted. A drop of gold chloride (1 Gm of reagent gold chloride in 20 cc of water) is added to a drop of the alkaloidal solution and the crystals formed are compared with crystals from a control solution. Description of the crystals is given.—J *Assoc Official Agr Chem*, 18 (1935), 86 (G S W)

Hydrogen Sulphide—Quantitative Estimates of, in Lotions Used in Treatment of Acne Relative values are given for the hydrogen sulphide content of various lotions used in the treatment of acne vulgaris.—H GOODMAN *Arch Dermatol Syphilol*, 28 (1933), 847, through *Chem Abstracts*, 29 (1935), 290

Hypochlorite Solutions—Determination of Available Chlorine in, by Direct Titration with Sodium Thiosulphate The reaction between sodium thiosulphate and hypochlorite solutions was studied quantitatively. (a) By titrating an acetic acid solution of sodium hypochlorite with 0.1N sodium thiosulphate solution, using starch-potassium iodide paper as an outside indicator, (b) by adding an excess of potassium iodide to an acetic acid solution of sodium hypochlorite, and titrating the liberated iodine with the thiosulphate solution using starch solution as an internal indicator. Results show that thiosulphate, added to an acetic acid solution of a hypochlorite, is completely oxidized to the sulphate and that eight equivalents of chlorine are used per mole of sodium thiosulphate.—V A WILLSON *Ind Eng Chem, Anal Edit*, 7 (1935), 44 (E G V)

Hypophosphites—Determination of A tentative method was adopted. Total hypophosphites are determined as magnesium pyrophosphate, following a procedure analogous to that for phosphoric acid. Calcium is determined on the same prepared solution by precipitation as the acetate and conversion to the sulphate.—J *Assoc Official Agr Chem*, 18 (1935), 87 (G S W)

Iodine—Determination of, in Plant Material A tentative method was adopted. The sample, mixed with calcium oxide and copper oxide is ignited in a combustion furnace. The vapors are drawn over hot platinized asbestos and absorbed in potassium carbonate solution. The residual ash is leached and the solution obtained combined with the carbonate solution evaporated to dryness, taken up with water and extracted with alcohol. The alcoholic extract is evaporated to dryness, ignited, dissolved in water, treated with sulphuric sulphurous acids and extracted with carbon disulphide in the presence of sodium nitrite. The carbon disulphide extracts are compared in a colorimeter with standards. The results are expressed in parts per million or per billion.—J *Assoc Official Agr Chem*, 18 (1935) 73 (G S W)

Iodide—Method for the Colorimetric Determination of Small Quantities of, in Presence of Other Halides This method is based upon the oxidation of the iodide with nitric acid and its

subsequent extraction with carbon tetrachloride and determining the quantity of iodine by colorimetric comparison with standard solutions of iodine. The authors point out that the use of acid permanganate is impractical when fluorides, chlorides or bromides may occur along with an iodide but that nitric acid of proper concentration is entirely satisfactory. Full details of the procedure and tables showing its accuracy are given.—A C BOSE and K N BAGCHI *Analyst* 60 (1935), 80 (A H C)

Reduced Iron—Note on the Assay of. Report is made of experimental work which compares the proposed method for U S P XI with a modification of the British Pharmacopœia. The U S P XI method heats mercuric chloride solution and reduced iron on a water bath for ten minutes instead of boiling for five (U S P X) and the B P method is with copper sulphate. Comparative results are tabulated, probable error calculated. In the presence of ferric oxide, ferrous sulphide and ferrous phosphide, the copper sulphate method did not give the best results. The mercuric chloride method gave absolute values in the presence of these impurities.—M OAKLEY and J C KRANTZ, JR. *J Am Pharm Assoc*, 24 (1935) 9 (Z M C)

Lead—Electrolytic-Colorimetric Method for the Microdetermination of. The solution to be analyzed is placed in an electrolytic beaker together with 4 cc of nitric acid (sp gr, 1.42), 8 drops of 3 molar sulphuric acid and enough water to make the volume 35 cc. The anode is a small platinum gauze cylinder and the cathode a spiral of platinum wire. The solution is electrolyzed for 12 to 18 hours at 10 volts with a current of 0.05 ampere, the anode is taken from the solution just as the current is short circuited. After rinsing, the anode with the lead peroxide deposit is heated at 180° C for 2 hours and when cold weighed against its tare. The solution remaining after electrolysis together with the liquid from the anode washing is evaporated over a steam bath to 10 cc. In each of two 50 cc Nessler cylinders there are placed 2 cc of 10 per cent potassium cyanide, 5 cc of 6N ammonium hydroxide and 2 Gm of ammonium acetate. The solution from the casserole is placed in one cylinder and a known amount of a lead nitrate solution, containing 0.01 mg of lead per liter, is placed in the other, the cylinders are filled to the mark and 3 drops of sodium sulphide solution added to each. The solutions are then compared in a Leitz colorimeter. Small amounts of lead, 2 to 15 mg, can thus be determined with an error well below 1 per cent.—M RANDALL and M N SARQUIS *Ind Eng Chem, Anal Edit* 7 (1935), 2 (E G V)

Lead in Urine—Quantitative Spectrographic Determination of. The spectrographic determination of lead in urine is described. A Bausch and Lomb Littrow type quartz spectrograph, capable of taking the region $\lambda 2100$ to $\lambda 8000$ Å on three 25 cm plates was used. An arc between 7-mm Acheson regraphitized spectrographic electrodes whose spectra did not show a lead line was adopted as a means of excitation. The quantity of lead excited by the arc was determined by inserting a revolving logarithmic sector in the light beam between the arc and the spectrographic slit. Bismuth is used as the internal standard. The lead line $\lambda 2833.2$ Å and the bismuth line $\lambda 2898.1$ Å were used. The preparation of solutions and method of calculating quantity of lead from the photographic plates are given.—J CHOLAK *J Am Chem Soc*, 57 (1935), 104 (E B S)

Lipoid—Determination of Total, in Plant and Animal Tissues. Lipoids were extracted from various plant and animal tissues. Ether alcohol mixture gave too high a value, as the extract also contained carbohydrates and salts. Ether or petroleum ether too low, as phospholipins were left behind. The true amount was given by extracting with ether and alcohol for 30 minutes at 60° C and reextracting with petroleum ether.—J S CHEN *Chin J Physiol*, 8 (1934), 195, through *Physiol Abstracts*, 19 (1935), 563 (S W G)

Meat Extract and Yeast Extract—Suggested Test for Distinguishing between. About 10 Gm of the sample are digested in a mortar with 20 cc of 70 per cent acetone solution (in water). The yellow supernatant liquid is run off through a filter and the clear filtrate tested as follows. To 3 cc of the filtrate a few drops of strong bromine water are added, when darkening in color takes place. (If an excess of bromine be added the dark color vanishes and is not restored by reducing agents.) After standing for 5 minutes a dark red color is developed. Two cc chloroform are now added and the mixture is shaken. On separating the chloroform layer is colored deep reddish violet. This test was applied to commercial yeast extracts, and also to a specimen extract prepared in the laboratory from air-dried brewer's yeast. The same result was obtained in all cases. Many of the well known meat extracts were then submitted to the test, but none gave this reaction. The test gave good results for a mixture of yeast extract and meat

extract It is interesting to note that a similar acetone extract of egg-yolk gave this pink color with bromine, and also that of the fat free portion of cheese It would appear that the tryptophane grouping is free to react with the bromine in the above substances, with the exception of the meat extracts—R O BLENCH, *J Soc Chem Ind*, 54 (1935), 148 (E G V)

Mercury—Determination of, in Mercurial Ointment A tentative method was adopted The sample is digested with nitric acid (1:1), the aqueous extract removed and the residue washed The combined aqueous extracts are washed with ether and titrated with ammonium thiocyanate, (0.1N)—*J Assoc Official Agr Chem*, 18 (1935), 85 G S W

Morphine—New Colorimetric Method for Determining, and Its Derivatives The Folin and Malmros colorimetric method for determining glucose is modified so that it can be used for determining morphine and its derivatives The reduction of potassium ferricyanide is allowed to proceed at a lower pH The presence of potassium cyanide to accelerate the reaction is not necessary and the reduction proceeds at room temperature, the reduction reaches maximum values in about 5 hours Under these conditions reduction does not take place in derivatives of morphine in which the hydrogen of the phenolic group is substituted by side chains, alpha-monoacetylmorphine, which has a free phenolic group, gives the same values as morphine At a boiling temperature the reduction of potassium ferricyanide is influenced by other groups, and values for morphine are obtained which are exactly 3 times those obtained at room temperature At room temperature morphine in a concentration of 1:100,000 can be determined accurately The method is sensitive and reliable, a 0.151 per cent morphine hydrochloride solution gave 0.154 per cent by this method Other morphine derivatives can be determined if they have a free phenolic group, those in which the hydrogen is substituted by alcohol or acetyl chains can be assayed by introducing the phenolic group through splitting off the chains—G RIZZOTTI *Boll soc ital biol sper*, 9 (1934), 509, through *Chem Abstracts*, 29 (1935), 292

Nitrates—Determination of, in Tablets A tentative method was adopted Aliquots of a water solution are treated with saturated potassium chlorate Nitric acid (1:1) is added and, after standing, silver nitrate (0.1N) The solution is filtered and titrated with potassium thiocyanate solution Correction is made for chlorides if present—*J Assoc Official Agr Chem*, 18 (1935), 89 (G S W)

Pancreatin—Determination of Amylolytic Activity of The author finds that the reaction between pancreatin and starch should be continued for at least 1 hour The determination of amylolytic activity should be carried out at 37° C Higher temperatures give exceedingly low values—A DE CLERCQ *J pharm Belg*, 17 (1935), 95 (S W G)

Pepsin—Determination of Proteolytic Activity of The optimum acidity for the proteolytic digestion of coagulated egg albumin has been found by the authors to be at pH 1.3 Determinations of activity of pepsin or its preparations should be carried out at 37° C—A DE CLERCQ and M VAN HAUWAERT *J pharm Belg*, 17 (1935), 59 (S W G)

Perchlorates—Determination of Chlorates are quantitatively reduced in the cold by titanous chloride while perchlorates are not appreciably reduced in dilute aqueous solution, even on prolonged boiling The perchlorates are completely reduced, however, by a concentrated solution of titanous chloride in a fairly strong sulphuric acid solution—M L NICHOLS *Ind Eng Chem, Anal Ed*, 7 (1935), 39 (E G V)

Petroleum Products—Viscosity of The Saybolt viscometer is satisfactory for plant control work and for determining specifications of commercial petroleum products, but it is not sufficiently accurate for research purposes An improved Ostwald viscometer is described The following equation connects kinematic viscosity (KV) and Saybolt viscosities (S) above 5000 KV = 0.002042 S + 0.40—W B McCLUER and M R FENSKE *Ind Eng Chem* 27 (1935), 82 (E G V)

Podophyllum—Determination of A tentative method was adopted The drug is percolated with alcohol, 90% of the percolate is collected in one beaker, the remainder in a second beaker The contents of the first is evaporated to a small volume, poured into cold (10°) dilute hydrochloric (about 0.01N) and mixed with the contents of the second beaker After standing 12 hours in the cold, the precipitate is filtered in a Gooch crucible, dried and weighed—*J Assoc Official Agr Chem*, 18 (1935), 89 (G S W)

Potassium Dichromate—Standardization of A 1 Gm sample of arsenous oxide is treated with a little water, 1 Gm of sodium hydroxide is added, the mixture is warmed, and then 50 cc

of 5 normal sulphuric acid are added. Now slightly less than 1 Gm of potassium dichromate is added, the solution is stirred, diluted to 400 cc, and allowed to stand for 5 minutes. Three drops of 0.025 molar *o*-phenanthroline ferrous complex, as indicator, and three drops of 0.01 molar osmium tetroxide, as catalyst, are added. The excess arsenous acid is back-titrated with 0.025 normal ceric sulphate, at the end point the rose color of the solution changes to a clear green.—H. H. WILLARD and P. YOUNG *Ind Eng Chem, Anal Edit*, 7 (1935), 57 (E G V)

Potassium Iodide—Assay Process for Of samples of *Liquor Iodi Mitis* purchased under the Foods and Drugs Act which were satisfactory with regard to the proportion of iodine and potassium iodide only 50% were free from hydriodic acid. In the remainder the hydriodic acid present caused an increase in the iodate titration of 0.15 to 0.4 cc, corresponding to 0.02 to 0.07% of potassium iodide. When it is remembered that different workers can obtain identical results, an error of 0.4 cc is much too high to pass without correction. All samples of *Liquor Iodi Fortis* and *Mitis* should be examined for the presence of hydriodic acid and the iodate titration corrected before the proportion of potassium iodide is calculated. To estimate the hydriodic acid, 10 cc is titrated with sodium thiosulphate phenolphthalein or methyl red added and the solution titrated with sodium hydroxide.

$\text{Cc } 0.1N \text{ NaOH used} \times 0.01279 \times 10 = \text{per cent HI}$

$\text{Cc } 0.1N \text{ NaOH used} \times 0.0166 \times 10 = \text{per cent KI}$ to be subtracted from that found by the official process

If check is required 10 cc may be evaporated to dryness, treated with water and evaporated again, the process being repeated until only a faint brown color remains. After drying at 110° C the residue is ignited at very low temperature for a moment or two. Potassium iodide only remains and may be estimated by iodate as usual.—M. HERD *Pharm J*, 134 (1935), 87

(W B B)

***n*-Propylarsonic Acid—Use of, as a Reagent for the Determination of Zirconium** Zirconium chloride solution in not more than 10 per cent by volume of hydrochloric acid is heated to boiling and the zirconium precipitated with 25 cc of a 5 per cent aqueous solution of *n*-propylarsonic acid. The mixture is boiled 2 or 3 minutes, cooled, filtered, the precipitate washed free from chlorides, ignited to constant weight and weighed as zirconium oxide. The presence of tin, thorium, manganese, nickel, iron, aluminum, vanadium, chromium, titanium, copper, cerium, magnesium, zinc, uranium, molybdenum, cobalt, beryllium and cadmium did not interfere. Antimony and bismuth did. Satisfactory results could not be obtained in concentrations of sulphuric acid above 4.5 per cent by volume. Allylarsonic acid, though tried, was not as satisfactory as *n*-propylarsonic acid.—F. W. ARNOLD, JR., and G. C. CHANDLER *J Am Chem Soc* 57 (1935), 8

(E B S)

Quillaja Saponin—Colorimetric Test for An acid solution of sodium nitrite, followed by excess of alkali, was found to produce a yellow colored solution. The depth of color was found to be proportional to the amount of saponin present. One per cent solutions of saponins in distilled water were prepared and tested as follows. Ten cc of these solutions of saponin were placed in Nessler glasses, graduated to 50 cc. One cc of a 10% aqueous solution of sodium nitrite was added, followed by two drops of sulphuric acid, and after 30 seconds twenty cc 1*N* sodium carbonate added. The colored solution was then made up to 50 cc with distilled water. To prevent frothing a few drops of ether were carefully dropped on to the surface of the solution. The full color is not developed for about five minutes, and is then stable for several hours. As yet, it has not been found possible to use this test for the determination of saponin in quillaja bark, as interfering substances are extracted with the saponin. The addition of the reagent giving a very dark colored solution. No method has been found for purifying the saponin without loss. Preparations of senega root give a wine red color, therefore it is not impossible to detect added quillaja saponin in these. Phenols and other substances which give a reaction with the reagents used should not be present.—J. RAE *Pharm J*, 134 (1935), 59

(W B B)

Quinine—Determination of, in Chocolate Tablets In contrast to the method of the Greek Pharmacopœia in which cacao butter is removed with ether and the pellets then treated with sodium hydroxide, chocolate tablets are first extracted for 3 hours with petroleum ether in a Soxhlet apparatus. Quinine tannates are less soluble in this than in ether. The residue is

dried and further extracted for 10 hours with alcohol. The alcoholic solution is evaporated, mixed with sodium hydroxide and extracted 3 times with ether. This ethereal extract is repeatedly washed with water, evaporated, dried with alcohol and the residue titrated with 0.1N hydrochloric acid with lacmoid indicator. Control analyses showed an error of 0.5-1.6 mg of quinine in an original content of 60 mg.—A. JUSTINIANOS and J. PIERRA, *Praktika (Akad Athenon)*, 8 (1933), 173, through *Chem Abstracts*, 29 (1935), 543.

Quinine, Quinidine and Cupreine—New Color Reaction of, and Its Application to the Determination of Quinine. Quinine the methyl ether of cupreine, is extracted by the usual solvents, from cinchona bark and purified from ether. The methyl group is removed by warming in a glycerin bath to 180° after adding sulphuric acid. Nitroaniline is added, diazotization is then carried out, 30 per cent sodium hydroxide is added, and finally sulphuric acid is added. A stable red orange precipitate is obtained which is soluble in 95 per cent alcohol. A similar reaction is produced by quinidine and cupreine. Cinchonine and cinchonidine do not give this reaction. **Quantitative determination of quinine.**—About 0.1 Gm of drug accurately weighed and finely powdered is mixed with 0.2 Gm of calcium oxide and 2 cc of water. The mixture is digested on a water-bath. 5 cc of chloroform are added, and then heated to boiling, filtered, the residue is digested again as above and filtered. The liquid is then evaporated and the residue is treated with 30 drops of sulphuric acid, then 2 cc of water, warmed, then cooled and placed in a 10 cc graduate. One cc of this liquid is taken (contains alkaloids from 0.1 × 0.1 Gm of drug used) and placed in a colorimetric tube and placed in a heated glycerin bath. A temperature of 180° is maintained for 5 minutes, then the tube is cooled and the contents placed in 2 cc of water. Para-nitroaniline diazo compound is then added, stirred, alkalinized with 10 drops of 30 per cent sodium hydroxide and 10 drops of sulphuric acid is finally added. The product is dissolved in 2 cc of 95 per cent alcohol and the orange solution is compared with a standard in a colorimeter. A modification of the method is given for tincture and fluidextract of cinchona.—J. A. SANCHEZ, *J pharm chim*, 21 (1935), 24 (M M Z)

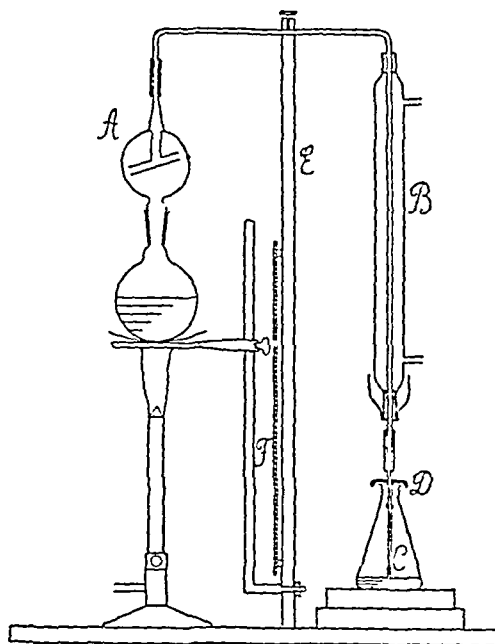
Salts of Organic Acids—Assay Methods for. A method of assay for sodium benzoate and sodium salicylate, described by Henville in 1927, may be used as a general method. In this method the salt is titrated directly with standard acid in the presence of diethyl ether with methyl orange indicator. Consider a salt MA. $MA + HCl \longrightarrow MCl + HA$. The method is applicable where HA is sparingly soluble in water and readily soluble in some solvent immiscible with water, where HA is not too strong an acid, apparent dissociation constant less than 2.5×10^{-3} , where MOH is not too weak, apparent dissociation constant greater than 10^{-6} . It is applicable to ammonium benzoate and salicylate and other salicylates, to sodium barbital and sodium phenobarbital. Procedure and results are discussed.—R. M. HITCHENS, *J Am Pharm Assoc* 24 (1935) 11 (Z M C)

Santonin—Determination of, in Mixtures. A tentative method was adopted. The sample in a Gooch crucible is washed with petroleum ether (saturated with santonin) and the washings discarded. Extraction is made with hot benzene, the extract evaporated to dryness, dissolved in alcohol and made up to volume. Aliquots are treated with dimnitrophenylhydrazine solution (1 Gm of 2,4-dinitrophenylhydrazine in 90 cc of water and 10 cc of sulphuric acid), allowed to stand 48 hours in the dark, filtered, washed with alcohol, dried and weighed.—J. Assoc Official Agr Chem 18 (1935) 87 (G S W)

Sugar—Comparison of Reducing Sugar Methods. Results of determinations of invert sugar by the Allihn, Herzfeld and Munson and Walker methods indicate that the Herzfeld method is the most reliable for determination of invert sugar in raw sugars. The Lane and Eynon volumetric method, which is a tentative one, agreed well with the Herzfeld method.—F. W. ZERBAN, W. J. HUGHES and M. H. WILEY, *J Assoc Official Agr Chem* 18 (1935), 118 (G S W)

Sweetening Agents—Microanalytical Studies of Synthetic. The authors describe a modification of their method for the detection of saccharin in beverages. A special stirring apparatus was devised which greatly accelerated the speed of diffusion from the aqueous to the ether layer. By organoleptic tests saccharin may be detected within one to three hours in concentrations of 0.00025 to 0.001 per cent. Fahlberg's method was applied to the quantitative determination of saccharin in beer. The saccharin is hydrolyzed by refluxing for two hours with 20 per cent sulphuric acid. After cooling the liquid is neutralized carefully with 30 per cent sodium hydroxide (carbonate free), excess base is added and the mixture is then shaken vigorously.

in a flask fitted with an overflow tube and distillation arm to absorb the carbon dioxide in the atmosphere of the flask. A distillation apparatus with ground glass connections is preferred, since the hydroxide splits off alkaline products from rubber stoppers. In the diagram, the overflow tube *A* is attached to a non-corrosive steel tube *B* of 4 mm internal cross section. The cooling portion is about 20 cm long. The metal tube is joined to the overflow tube by means of a rubber connection and the delivery end of the tube is connected by the same means to a hard glass capillary *C*. At the beginning of distillation the end of this tube is immersed in 15 cc. of water neutralized to methyl red and placed in a flask which is supported by two blocks. During distillation the flask is covered by a rubber plate weighted with a lead ring *D* through which is passed the glass capillary. *E* is a support for the apparatus. *F* a plate to protect the receiver from heat. Toward the end of distillation the receiver is lowered several centimeters so that the distillate drops into the receiver. If more than 2-3 mg of ammonia are thought to be present several cc of *N*/70 acid are placed in the receiver with the water, otherwise distilled water alone is used.



Saccharin Determination Apparatus

monium thiocyanate. As an optional method the precipitated silver chloride may be weighed — *J Assoc Official Agr Chem*, 18 (1935), 84 (G S W)

Theophylline—Quantitative Determination in Soluble Preparations Comparison of various methods of assay of theophylline showed that an argentimetric method gives too high and iodometric methods too low results. Only the methylation method of Self and Rankin (*Quart J Pharm and Pharmacol*, 4 (1931), 346 and B P 1932) was satisfactory but a simpler procedure is described. Although theophylline is quite difficultly soluble in either chloroform or isopropyl alcohol, it is soluble (about 1 part in 24) in a mixture of 3 volumes of chloroform and 1 volume of isopropyl alcohol. An assay is devised using the solvent mixture for isolation. Extracting an acidified theophylline sodium-acetate solution gave too high results, the acetic acid interferes. This is avoided by evaporating away the acetic acid freed by sulphuric acid before extracting the purine. Assays are described as follows (1) *For theophylline sodium acetate* Four-tenths Gm of theophylline salt is mixed with 2.5 cc 2*N* sulphuric acid and 7.5 cc water in an evaporating dish and evaporated to dryness on the water-bath. Five cc of water are poured on the residue and evaporated then 2 cc more and evaporated. The residue is warmed with 5 cc

From one third to one half the original volume of liquid is collected and the distillate then titrated with *N*/70 acid, using methyl red as indicator. The error introduced by back titration with a base is eliminated. One cc of *N*/70 acid corresponds to 0.2 mg nitrogen to 2.616 mg free saccharin to 3.445 mg of the sodium salt containing two molecules of water of crystallization to 2.39 mg of the water free salt. The authors, by combining their diffusion method with that of Schmidt, were able to detect saccharin in a concentration of 0.0003 per cent. A sensitive test for salicylic acid, based upon the precipitation of bromo phenol by bromine vapor is also described — V STANEK and P PAVLAS *Mikrochem*, 16 (1935), 211 (L L M)

Tetrachlorethylene — Determination of, in Mixtures A tentative method was adopted. The sample is refluxed with sodium metal dispersed in xylene. Amyl alcohol is added during refluxing. The solution is cooled acidified with nitric acid, extracted with water and 0.1*N* silver nitrate added to the filtered aqueous solution. The excess silver nitrate is titrated with 0.05*N* am

water and 0.5N sodium hydroxide added drop wise until methyl red (2 drops solution) changes color, then is evaporated to dryness. The residue is rubbed up cautiously into 30 cc of a mixture of 3 volumes chloroform and 1 volume isopropyl alcohol, added portion wise. The carefully poured off extract is filtered through a small filter into a separatory funnel where the extract is shaken with 5 cc of wash water, which is tapped away and then run into a tared flask. Extraction is repeated with two portions of solvent (20 cc, then 10 cc) which are washed with the same 5 cc of water used for the first washing. The combined extracts are evaporated to dryness on the water bath. To prevent spattering and bumping at the last, the flask is immersed in boiling water. The recovered solvent mixture may be rectified and used again. The residue, dried at 100° C to constant weight, is weighed. Multiplying by 1.100, the weight of anhydrous theophylline is converted to weight of crystalline theophylline. (2) *For aminophylline* (Euphylline) Three tenths Gm aminophylline are dissolved in 2 cc water in a small separatory funnel and N or 2N hydrochloric acid added until color change of methyl red (2 drops of solution). Then for one minute the solution is shaken with 25 cc of the solvent mixture described above, the tapped off extract filtered through a small filter into a tared flask. The extraction is repeated 3 times with 20 cc, 20 cc and 10 cc of solvent and the filtered extracts combined in the flask, evaporated to dryness on the water-bath, the residue dried to constant weight at 100° C. The conversion factor from anhydrous to crystalline theophylline is then applied. The titer of aminophylline gives the ethylenediamine content. The ethylenediamine hydrochloride is not dissolved by the solvent mixture. On drying aminophylline 3 days over calcium chloride, besides loss of water, 2.17% ethylenediamine is lost.—F. REINERS *Dansk Tids Farm*, 9 (1935), 11 (C S L)

Titration Apparatus—Continuous Reading A simple inexpensive apparatus to be used as an aid in teaching electrometric titration is described. All parts except galvanometer and milliammeter can be purchased from a radio dealer. Graphite-platinum, tungsten-platinum and silicon carbide platinum electrode pairs are used instead of calomel half-cell platinum. Details of procedure are reported. The apparatus has been applied to the titration of some ferrous iron compounds of the U S P.—L. H. BALDINGER *J Am Pharm Assoc*, 24 (1935), 6 (Z M C)

Vitamin C—Titrimetric Assay of A review of the method of the Food and Drug Administration, U S Department of Agriculture.—B. RÖNNMARK *Farm Revy*, 34 (1935), 126 (C S L)

Triethanolamine—Detection and Determination of In the analysis of creams in which the fatty base is incorporated in water, the material is saponified, evaporated to dryness with lime, and the residue extracted with boiling absolute alcohol. The alcoholic extract on evaporation, yields a viscous residue containing any triethanolamine, glycerol or ethylene glycol which may have been in the original material. It is shown that commercial triethanolamine gives with hydriodic acid a white crystalline substance having the formula $(\text{CH}_2\text{OH})_3\text{NHI}$ containing 53.6 per cent of the base and having a melting point of 169° C. Details of the method are as follows: "An accurately weighed portion (about 0.5 Gm) of the viscous residue from the alcoholic extraction described above is evaporated to dryness with 0.5 cc of constant-boiling 57% hydriodic acid and 5 cc of water in a glass dish. The residue is stirred with 5 cc of pure isopropyl alcohol, transferred to a sintered glass crucible, and washed three times with 5 cc portions of the alcohol, the crystals being sucked as dry as possible after each washing. The crucible and contents are dried to constant weight at 100° C, and a correction of 1 mg for each cc of iso propyl alcohol used in the transfer and washing of the crystals is applied. The m p of the product (169° C) serves to identify triethanolamine. The weight obtained, multiplied by 0.536 gives the weight of triethanolamine present." The method was tried out on commercial triethanolamine alone and in the presence of glycerol and ethylene glycol with highly satisfactory results.—H. R. FLECK *Analyst*, 60 (1935), 77 (A H C)

TOXICOLOGICAL CHEMISTRY

Arsenic—Presence of, in Bismuth Preparations Arsenic determinations were made on 24 samples of bismuth preparations, arsenic was present in none in amount sufficient to cause symptoms.—*Arch Dermatol Syphilol*, 28 (1934), 841, through *Chem Abstracts*, 29 (1935) 290

PHARMACOGNOSY

VEGETABLE DRUGS

Aloe—Evaluation of A very comprehensive research has been made bearing on the chemical composition physiological action, qualitative, quantitative and physiological evaluation and an interesting account of the use of the crustacean daphnia as a biologic test animal The author's conclusions are that (1) the chemistry of aloes is by no means sufficiently cleared up to permit chemical evaluation, (2) Curacao aloes is strongest, (3) the residue, freed from all but about 2 per cent of aloin, is almost as active as Curacao aloes, (4) Aloin while less effective is more toxic particularly as it affects the kidneys, (5) and there is slightly increased activity in alkaline solutions on standing—A VIEHOEVER *Am J Pharm*, 107 (1935), 47 (R R F)

Artemisia—New Crystalline Principles from Indian In the course of the examination of a large number of *Artemisia* species, many of which were collected on the N W Frontier of India, but also many from both adjacent and distant territory two distinct crystalline principles differing from santonin, were isolated from certain of these species One of these crystalline principles was obtained by the ordinary method for the assay of santonin, which fact seemed to indicate some relationship between the two respective bodies, and for laboratory convenience it was named pseudo santonin Assay of further samples of *Artemisia* from another district on the N W Frontier yielded a crystalline principle quite distinct from either santonin or pseudo santonin, although in some respects much more closely resembling santonin For laboratory convenience this second new principle was provisionally named K-santonin to distinguish it from the pseudo santonin, and to indicate the district from which the material had been collected These two crystalline principles are quite distinct from artemisin, a crystalline principle separated from the mother liquors in working *Artemisia maritima* for santonin The following table conveniently classifies these various bodies

Properties	True Santonin	K. santonin	Pseudo santonin	Artemisin
PHYSICAL				
Melting point	172	210-218	184-186	200
Specific rotation	-172.5	-140	-172.5	-84.3
Sensitivity to light	Very sensitive	Much less sensitive	Insensitive	Less so than santonin
REACTIONS				
Alcoholic potash	Carmine red	Pale carmine red	Brownish yellow	Pale carmine red
Sulphuric acid cooled	No color	No color	Immediate dark brown	No color
SOLUBILITIES				
Alcohol (90%)	1-0.0	1-116	1-15	
Ether 0.720	1-140	1-625	1-312	
Chloroform	1-2.5	1-4.2	1-4.2	Forms a compound
Boiling water	1-416	1-590	1-45	1-60
Cold water	Almost insoluble	Almost insoluble	1-300	

Further chemical investigation reveals that the principle provisionally named K santonin is a levo isomer of true santonin It shall henceforth bear the name of β santonin The research of pseudo santonin is still in progress—T SMITH and H SMITH *Pharm J*, 134 (1935), 3

(W B B)

Bixa Orellana L.—Analysis and Therapeutic Action of Ripe fruits weighing 12 to 18 Gm are composed of rind (22 per cent) pulp (68 per cent) and seeds (10 per cent) The rind contains ethereal oil (0.05 per cent), resin (1.0-1.65 per cent), tannins and cellulose The pulp consists of volatile substances (20-28 per cent), coloring matter known as orlean or annatto (4.0-5.5 per cent), various sugars including sucrose (3.5-5.2 per cent), ethereal oil, a trace of an unknown alkaloid, saponin and tannin The seed is composed of seed coat (18 per cent) containing waxes and ethereal oil, and of kernel (82 per cent) containing 8 to 11 per cent of fatty oils the constants of which closely resemble the fatty oils of *Raphanus sativus* L Therapeutically, the fruit pulp made into a maceration (2-3 per cent) or a decoction (1-2 per cent) is used for dysentery, a tincture or fluidextract of the seed coat is used as a tœniacuge or in the obstinate constipation of swamp fever, a 1.25 per cent infusion of the whole seed is used in the treatment of asthma, for the prevention of night sweats in phthisis and for the prevention of mucous in the nasopharynx A kataplasm prepared from the unripe fruit is used as an emollient for leprosy while an evaporated alcoholic extract may be used in a manner similar to that of a mustard plaster A kataplasm prepared from the fresh leaves is also used as a mild rubefacient—F W FRIESE *Pharm Zentralbl*, 76 (1935), 4 (E V S)

Digitalis—Chemical Study of Sierra Nevada Crystalline digitalin in the leaves of Sierra Nevada digitalis was determined by the Perrot and Bourcet method (*C A*, 22 (1928) 2437), there was found 0.548 Gm per Kg of dried leaf, almost twice the quantity characteristic of commercial leaf. Analysis of leaves stabilized in the Vera Guglieri apparatus (*Bol Univ Granada*, 4 (1932), 333) showed that only 1–20 of the glucoside remains in the drug —F. M. MARTIN and M. M. BROCAL *Anales soc españ fis quim*, 32 (1934), 838, cf Giral, *C A*, 28 (1934) 857 through *Chem Abstracts*, 29 (1935), 888.

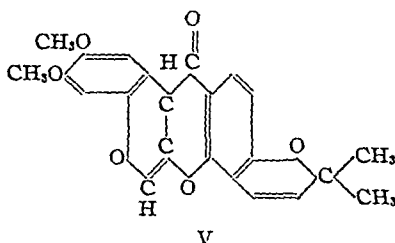
Digitalis—Sardinian The leaves of *Digitalis purpurea*, var *tomentosa* from Sardinia contained 1.117 per cent (Gennargentu), 1.101 per cent (Limbara) and 1.080 per cent (Sassari) total glucosides as compared with 0.988 and 0.950 per cent for two commercial samples. The ratios of digitoxin, digitalin, digitonin, digitalin and digitalein were approximately the same for all samples —I. SIMON *Arch farmacol sper*, 58 (1934), 101, through *Chem Abstracts*, 29 (1935), 532.

Iris Versicolor L. and Iris Virginica L.—Methods of Identification of Rhizomes of Various species of iris are briefly discussed. Because of the importance of Florida as a source, attempt has been made to distinguish the rhizomes of the two most abundant species from *I. virginica* and *I. versicolor*. Eight characteristics were studied: Dimensions, color, fracture, comparison of stellar and cortical radial values, count of vascular bundles in cross section, dimensions of vascular bundles and parenchyma cells, and odor. The monograph on *I. versicolor*, N. F. V. is open to criticism because a single description is used to describe the drugs from two species which differ markedly in some ways. Separate descriptions with distinguishing points are given. The name *Iris caroliniana* should be replaced by *Iris virginica* because of its priority. In order to distinguish official from spurious species the monograph should have more specific histological data, especially vascular bundle counts and dimensions, stellar and cortical ratios, the color of the drug and color reaction with vanillin and hydrochloric acid —G. M. HOCKING *J Am Pharm Assoc* 24 (1935), 17 (Z. M. C.).

Labiatae—Tannin Content of The use of the *Labiatae* in folk medicine is probably due to their high tannin content, which varies from 5 to 23 per cent of the dry substance —H. VOLLMER *Arch exp. Path. Pharmacol* 176 (1934), 207, through *Chem Abstracts* 29 (1935), 883.

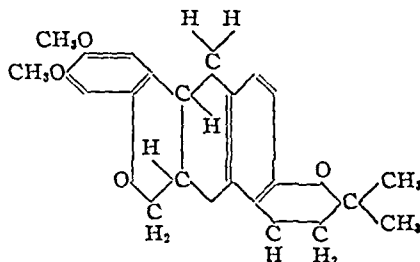
Liquorice Root—Report on, from Cyprus The unpeeled roots contained water (at 100°) 12.5, matter soluble in chloroform water 25.7, total ash 4.6 and acid-insoluble ash 0.3 per cent, the last two figures being on the moisture free basis —*Cyprus Agr J*, 29 (1934), 5, through *Chem Abstracts*, 29 (1935), 292.

Tephrosia Vogeli—Toxic Constituents of Seed Analysis of the kidney shaped black-brown seeds gave 39 per cent protein, 10.5 per cent fatty oil and 5 per cent ash. The acetone extract of seeds defatted with petroleum benzine is toxic to fish. Repeated fractional crystallization of the extract afforded dehydrodeguelin, $C_{21}H_{20}O_6$, m. p., 232–233°, allo tephrosin $C_{21}H_{20}O_7$, m. p., 194–195°, and iso deguelin, $C_{21}H_{20}O_6$, m. p., 168°. The derivatives of these substances *viz.* dihydro dehydrodeguelic acid, deguelic acid and derric acid agree in properties with the findings of Clark (*J Am Chem Soc*, 53 (1931), 315, 731, 2370). Allo tephrosin is not identical with tephrosin or iso tephrosin although, by elimination of water, it yields dehydrodeguelin. Upon boiling with acetic anhydride, it gives a substance crystallizing in colorless needles, designated iso dehydrodeguelin (V).



Allo tephrosin contains one acetylatable hydroxyl group. The melting point of the acetyl derivative is raised during eight days standing in vacuum or in air from 120.5° to 180° without

the compound changing its composition. Acetylation of hydrogenated allo tephrosin gave $C_{23}H_{27}O_7$, $COCH_3$. Treatment of the acetyl derivative with *p* toluenesulphonic acid gave dihydro dehydrodeguelin, proving that hydrogenation occurs in the pyran ring. By oxidation of allo tephrosin with potassium permanganate a dicarboxylic acid, $C_{23}H_{22}O_{11}$, *m p*, 170° was obtained. Iso allo tephrosin, $C_{23}H_{27}O_7$, may be obtained by allowing allo tephrosin to stand for a day in methyl alcohol saturated with ammonia or by alkaline hydrolysis of acetyl allo tephrosin. Elimination of water from iso allo-tephrosin by sulphuric acid treatment yields iso dehydrodeguelin (V). Iso deguelin was isolated only in small quantity. It is optically inactive and reduces ammoniacal silver nitrate solution upon prolonged warming. It is isomeric with rotenone. The oxime melts at $233-234^\circ$. Reduction in acetic acid solution with platinum oxide catalyst gave dihydro desoxy-iso deguelin, $C_{23}H_{26}O_6$ (XII).



XII

In weak alkaline alcoholic solution, iso deguelin is converted in two days to iso allo tephrosin. The naturally occurring constituents of tephrosia seed undergo extensive modification under the influence of alkalis. Allo tephrosin does not occur as such in the seed, but is produced by the chemical treatment applied to the drug. It may be regarded as a relatively stable intermediate product of the oxidation of iso deguelin to iso allo tephrosin. All three substances isolated slowly cause paralysis of earth worms. Concentrations of from 1/100,000 to 1/110,000 produce in 7-8 hours an irreversible paralysis, except in the case of dehydrodeguelin. The effects produced on ascarids are less pronounced than on earth worms. *In vivo* vermicide activity was not detected. The lethal dose of the crystalline mixture to mice was 0.01/20 Gm, the tolerated dose was 0.0066 to 0.007/20 Gm.—K. W. MERZ and G. SCHMIDT *Arch Pharm*, 273 (1935), 1 (L. L. M.)

Vehver Roots from Uganda. Steam distillation of the ground, pale yellowish brown roots, almost entirely free from rhizomes, yielded 1.8 per cent of a dark reddish brown, viscous oil of d_{15}^{20} 1.0383, n_D^{20} 1.5248, acid value 76.7 per cent and ester value 22.7 per cent. The oil was soluble in 1 volume of 80 per cent alcohol, but clouded on further addition of 80 per cent alcohol and did not become clear with a large excess of alcohol.—UGANDA PROTECTORATE *Ann Rept Dept Agr*, 1 (1933), 25, through *Chem Abstracts*, 29 (1935), 292.

ANIMAL DRUGS

Civet—Gathering of. A review.—M. G. GOUDERCHET *Drug and Cosmetic Ind*, 36 (1935), 27 (H. M. B.)

PHARMACY

GALENICAL

Chloral Suppositories—Note on the Preparation of. A review of the literature concerning the rectal administration of chloral in suppositories is given. The bases suggested for suppositories containing chloral are glycerin or cacao butter. The author reports that glycerin suppositories have been found unsatisfactory. The use of cacao butter alone as an excipient, using the fusion process, permits the incorporation of only 0.25 Gm of chloral hydrate per 4 Gm of suppositories in order to have the product melt at body temperature. Suppositories containing 33 per cent cacao butter and 66 per cent wax will retain 1 Gm of chloral hydrate per 4 Gm of suppositories, but they melt at a temperature above $45^\circ C$. The author suggests that a mixture

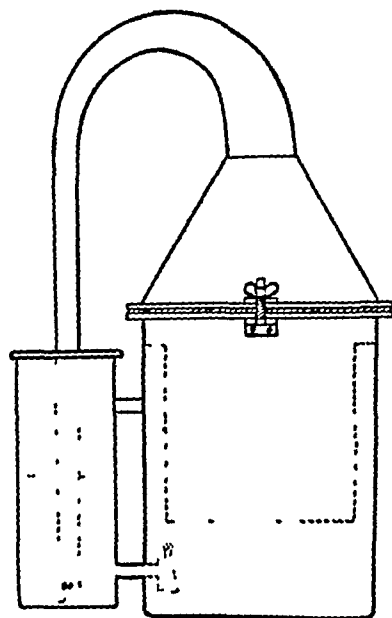
not exceeding 4 per cent of wax in cacao butter would be the most suitable proportion. To prepare such a suppository mixture, the medicament in the form of a fine powder is incorporated in about one-third of the cacao butter, then warmed to 40°C , the remainder of the cacao butter added, and when homogeneous, it is rapidly cooled.—C J RAVAUD *J pharm chim*, 21 (1935), 49 (M M Z)

Drug Extraction Processes—New The basic operations in modern drug extraction are (1) preparing and grinding of the drug, (2) extraction, (3) concentration and (4) solvent recovery. The various advances in carrying out these operations are discussed.—F CHILSON *Drug and Cosmetic Ind*, 36 (1935), 37, 109 (H M B)

Fats and Waxes—Heating of Williams shows how 22 different fats and waxes used in the manufacturing of cosmetic creams act under the application of heat and upon cooling. Observations show the importance of care in the cooling and melting of these products.—J M WILLIAMS *Drug and Cosmetic Ind*, 36 (1935) 33 (H M B)

Orange Juice—Browning of The browning of orange juice involves oxidation as a primary step. The primary products of oxidation then apparently undergo condensation reactions in which secondary reactions, probably amino acid-sugar reactions, occur. Interference with the formation of the primary products of oxidation by removal of oxygen or addition of reducing substances prevents browning. Sulphites and stannous salts are found to be of value in this regard. The addition of small quantities of sulphites or other antioxidants to pasteurized or benzoated juices or syrups preserves the color of such products. The reducing action of stannous salts, as well as the absence of oxygen in the canned orange juice, accounts for the fact that browning of canned juice does not occur either in plain tin or citrus enamel cans when stored at high or low temperatures. A large number of experimentally packed as well as commercially packed canned orange juices have been examined in the last four years without any browning having been found.—M A JOSLYN and G L MARSH *Ind Eng Chem*, 27 (1935), 186 (E G V)

Pharmaceutical Machinery The article gives a very complete review of modern machinery that is used in pharmaceutical manufacturing processes. The apparatus are described in detail and many illustrations are given.—*Chem and Drugg*, 122 (1935), 96 (T G W)



Steamer

Steamer—New Notes on Although the steaming of a solution at atmospheric pressure is not an official process for sterilization, it has been shown (*Quart J Pharm Pharmacol*, 7 (1934), 379-388) that many sterile solutions can be obtained by this simple procedure. That the method is reliable is supported by its inclusion in many foreign pharmacopoeias. The steamer is made of copper, weighs $4\frac{1}{2}$ lbs., and is about 14 inches high and 8 inches wide. It will easily stand on the ordinary laboratory tripod. On the inside of the steamer a small basket of perforated zinc carries the material to be sterilized. The capacity in terms of vessels commonly used for this purpose, is one 500-cc or two 100 cc or three 50 cc conical flasks or eight 25 or twelve 15-cc vaccine bottles. One of the outstanding features is the rapidity with which the water is raised to boiling. The sketch shows clearly the principles upon which the steamer has been designed.—H DAVIS *Pharm J*, 134 (1935) 116 (W B B)

Sterilization Notes The following formulas for injections, with directions for sterilization, are proposed for inclusion in the official formulary of the Chilean Association of Chemistry and Pharmacy: *Injectabilia Adrenalinæ Chlorhydratis*—Adrenaline, 1 Gm, benzoic acid, 0.3 Gm, hydrochloric acid 0.1 N 90 cc, sodium chloride 8 Gm, recently distilled water, to 1000 cc

Sterilize by tyndallization at 70° for one hour on three successive days *Inject Chinini Iodobismuthalis*—Quinine iodobismuthate, 10 Gm, guaiacolated oil, 5%, to 100 cc An aseptic preparation *Inject Camphoræ Oleosum*—Camphor, 20 Gm, Olive oil, neutralized, to 100 cc Sterilize in a closed container at 115° for fifteen minutes *Inject Coffeini Compositum*—Caffeine, 20 Gm, sodium benzoate, 28 Gm, recently distilled water to 100 cc Sterilize at 115° for fifteen minutes *Inject Emetini Hydrochloridi*—Emetine hydrochloride, 4 Gm, sodium chloride, 0.58 Gm, recently distilled water, to 100 cc Sterilize at 100° for thirty minutes—ANONYMOUS *Pharm J*, 134 (1935) 58 (W B B)

Syrup of Hydriodic Acid, U S P X—Stabilization of The discoloration in syrup of hydriodic acid has been ascribed to decomposition of levulose, due to the fact that sucrose is rapidly hydrolyzed into dextrose and levulose So the syrup was prepared with hypophosphorous acid to prevent free iodine and dextrose instead of sucrose If dextrose of C P quality is used it gives the best preparation but even with commercial dextrose the stability was greatly increased—W J HUSA and L J KLOTZ *J Am Pharm Assoc*, 24 (1935), 45 (Z M C)

Tablet Manufacture The physical properties of good tablets are summarized The tablet formula is divided into (1) the active ingredients, (2) base or diluents, (3) disintegrator, (4) lubricant and (5) binder or excipients and each of these components are discussed The following processes in manufacture are tabulated (1) mixing and milling of dry extracts and chemicals, (2) granulating (3) drying of granulations, (4) lubricating, (5) compressing and (6) coating and each is discussed—ANON *Drug and Cosmetic Ind*, 36 (1935), 35, 59 (H M B)

Wine—Effect of Cold and Freezing Storage on the Composition Results indicate a decrease in total tartaric acid, cream of tartar, extract and ash on cold storage This decrease was more pronounced when the wines were decanted and still more pronounced on longer storage Changes in alcohol volatile acid, nitrogen tannin and sugar are not significant—M A JOSLYN and G L MARSH *Ind Eng Chem*, 27 (1935), 33 (E G V)

PHARMACOPŒIAS AND FORMULARIES

Belgian Pharmacopœia IV—Some Remarks on A critical discussion of the monographs on chloretone morphine hydrochloride solid paraffin, phenacetin, medicinal soap, sodium salicylate, strychnine nitrate and theobromine, and the determination of iodine values for cod liver oil and linseed oil is given—C STAINIER *J Pharm Belg*, 17 (1935), 79 (S W G)

Cod Liver Oil—Critique of 1934 Interim Revision of Text and Assays for U S P The author believes that provision should have been made for the addition of antioxidants to cod liver oil, to delay the onset of oxidation, in such amounts as would be definitely harmless Methods should have been included for the detection of sophistication by the addition of highly potent vitamin containing substances, such as halibut liver oil or viosterol Objection is taken that no specific diet for breeding experimental animals is included, and also that directions for grouping rats for the assay period are too complex It is apparently felt that the Hawk and Oser salt mixture should be used in the vitamin A test diet, thus eliminating the laborious "problem in stoichiometric—freshman chemistry" The Roentgenographic method for the determination of the degree of decalcification should have been included as optional Opportunity ought to be provided for public trial and criticism of the method before its official adoption—B L OSER *Ind Eng Chem* 27 (1935), 230 (The reply of E F Cook is given (*Ibid*, page 233) as well as a rebuttal by Oser) (E G V)

Homeopathic Pharmacopœia—German The second revised edition of the German Homeopathic Pharmacopœia will be ready for distribution March 31, 1936 A brief summary of the conditions existing before the recognition of the present pharmacopœia is given At present a Commission is working to unify the international standards for homeopathic pharmacopœias and to consider a standard nomenclature A few of the corrections of the text are taken up and some of the specifications of the pharmacopœia noted A method of capillary analysis of homeopathic tinctures sensitive to a dilution of D8 is described The method may be modified so as to be applicable to globules tablets and triturations The pharmacopœia contains about 1000 preparations considered in fairly common usage and an appendix containing about 500 more arranged in tabular form—K HAAS *Schweiz Apoth-Ztg*, 73 (1935), 29, 40 (M F W D)

Microchemistry—Rôle of, in Pharmacopœias At present very little microchemistry is employed in the testing of chemicals, although the German Pharm VI and the Swiss Pharm V do include a method of micro sublimation for testing one drug. The micromethods, while economizing on samples and reagents, in general require expensive and specialized apparatus and for this reason will probably not come into general use. The article includes a comparison of the macro- and microchemical methods for the identification of several anions, cations and compounds, which methods might easily be substituted for existing tests.—ROSENTHALER *Scientia Pharm*, 6 (1935), 7 (M F W D)

Pharmacopœia—London Hospital The previous edition of the London Hospital Pharmacopœia was published in 1925, and a comparison of this new volume with its predecessor shows that the main reason for the revision has been the publication of a new British Pharmacopœia. Apart from the B P innovations, there is very little that is new in the pharmaceutical contents of the book.—ANONYMOUS *Pharm J*, 134 (1935), 7 (W B B)

Shellac, B P C—a Criticism The author criticizes the monograph headed, "Lacca (Lac) Shellac," from the standpoint of accuracy of nomenclature used. He also criticizes the omission of *Acacia Catechu* and *Zizyphus Xylopyra*, while *Ficus religiosa* and *Shorea robusta* have been used and are only of minor importance. Other criticisms of this monograph are recorded.—E J PARRY *Chem and Drugg*, 122 (1935), 46 (T G W)

U S P Revision A summary of some of the proposed changes of the U S P Revision is given for the following: Concentration of Diluted Acids, Acidum Boricum, Aqua, Aqua Distillata, Arsenii Iodidum, Barni Sulphas, Liquor Hydrogenii Dioxidii, Magma Magnesia, Pululæ Ferri Carbonatis (Assay), Potassii Carbonas, Sodii Benzoas, Sodii Iodidum, Sodii Phosphas, Tinctura Ferri Chloridi.—ANONYMOUS *Pharm J*, 134 (1935), 90 (W B B)

NON OFFICIAL FORMULÆ

Chapping—Preparations for Ingredients and methods of manufacturing of soothing creams, ointments and lotions offered.—ANON *Drug and Cosmetic Ind*, 36 (1935) 145 (H M B)

Creams—Preparation of Cosmetic Problems in the production of cleansing, cold and tissue creams are discussed. Formulas are offered.—J M WILLIAMS *Drug and Cosmetic, Ind*, 36 (1935), 143, 144, 146 (H M B)

Sinclair's Glue Sinclair's glue is an inexpensive adhesive used as a substitute for plaster in applying extension to fractured limbs. The original formula which still appears in the B P C 1934 contained two hygroscopic substances, glycerin and calcium chloride, to prevent excessive drying and brittleness in use. The present formula contains no calcium chloride because, experience has shown the calcium chloride reduced the adhesive properties. Two formulas for Sinclair's glue are now in use. Formula No 1 is "Very good" glue or gelatin, 50, water, 100, glycerin, 4 or 6, thymol or menthol, 0.15%. The smaller amount of glycerin is for summer or tropical use, and the larger amount for winter. Formula No 2 which is as follows is occasionally used: Isinglass 50, gelatin, 50, water 200, tannic acid, 12, glycerin 8 or more, thymol or menthol 0.15%. This second formula forms a stronger adhesive and is perhaps more elastic.—W A KNIGHT *Pharm J* 134 (1935), 7 (W B B)

DISPENSING

Incompatibilities—Ionic Reactions as the Cause of A table showing the insoluble products and their colors formed from cations and anions usually encountered in qualitative analysis is given.—A MOSIG *Pharm Zentralh* 76 (1935) 33 (E V S)

Vehicles for Medicines—Study of IX Fruit Syrups Variableness in fruit syrups because of fermentation, to destroy pectin may explain their limited use. Extensive experimentation with degrees of temperature, avoiding exposure to air and other methods have been tried. The addition of 0.1 per cent benzoic acid to strained fruit juice and standing at room temperature until the filtered juice will remain clear when one-half its volume of alcohol is added, proved satisfactory. The presence of benzoic acid permits activity of the pectase but inhibits vinegar and other bacterial fermentation. Objections to use of benzoic acid are discussed. Three formulas are submitted: syrup of raspberry, syrup of strawberry and syrup of cherry. Syrup

of cherry has a higher flavor if the juice is in contact with the crushed stones for some time. Examples of their usefulness as vehicles are given.—B FANTUS, H A DYNIEWICZ and J M DYNIEWICZ *J Am Pharm Assoc*, 24 (1935), 46 (Z M C)

PHARMACEUTICAL HISTORY

Acacia Historical facts are recorded.—H G KELBLY *Drug and Cosmetic Ind*, 36 (1935), 97, 101 (H M B)

Calcium Lactophosphate Preparations—History of First suggested in 1869, calcium lactophosphate was introduced into U S P of 1880 and continued in subsequent issues until the tenth when it was dropped and incorporated into N F V. An elixir has been in each N F. An emulsion of cod liver oil with calcium lactophosphate enjoyed considerable popularity but has dropped out of use.—W J HUSA and A P McLEAN *J Am Pharm Assoc*, 24 (1935), 58 (Z M C)

History—Value of, in the Drug Store The author pleads for an interest in things historical and shows how the drug store may make use of historical exhibits. Colleges of pharmacy can collect historical material and can assist in interesting young pharmacists in the history of medicine and pharmacy.—F B KILMER *J Am Pharm Assoc*, 24 (1935), 55 (Z M C)

Maimonides—Medical Works of, and His Treatise on Personal Hygiene and Dietetics This year marks the octocentennial of the birth of this Hispano Jewish philosopher, theologian, physician and astronomer. Although his fame as a distinguished and the most rational physician of the Middle Ages is great, it is overshadowed by his reputation as a philosopher and Talmudist. Maimonides practiced medicine with religious fervor and his extensive medical knowledge was sought by the Court and general population alike. His medical writings were voluminous and covered the field quite comprehensively, for those days. He also is known for his works on diet and personal hygiene, poisons and their antidotes, special treatises on asthma and hemorrhoids. To some extent he championed science against the fundamentalism of the Bible, though he was at all times honest and consistent in the belief of the truth of the Aristotelian system and convinced of the truth of the Mosaic doctrine and of the Divine origin of the Torah. Though much can be said pro and con for this and other of his works, at least Maimonides must be credited with the fact that he pointed out that philosophy and science did not begin nor did it end in the Scriptures and Talmud.—L GERSHENFELD *Am J Pharm*, 107 (1935), 14 (R R F)

Pharmacy—History of, in the Netherlands This address by Dr Hk Cohen at the celebration of the 90th anniversary of the Rotterdam Department of the Netherlands Association for the Advancement of Pharmacy contains an excellent historical review of pharmacy in the Netherlands beginning with the guilds of the seventeenth century and continuing to the recent past. Historical sketches of many famous Dutch pharmacists: van Anckeren, van der Schinne, Mulder, Fortuyn, Robertson, Grutterink, Nortier, Eshuyes, van der Burg, de Vrij and others, and their influence on pharmacy are included.—*Pharm Weekblad*, 72 (1935), 42 (E H W)

Urinalysis among the Ancients—The author describes the methods employed for the investigation of urine in diagnosis and prognosis among the ancients. Beginning with Hippocrates in the 5th century B C he carries his history through the middle ages.—M WAGENAAR *Pharm Weekblad*, 72 (1935), 124 (E H W)

PHARMACEUTICAL LEGISLATION

Legislation—Food and Drug Attention is directed to the position of the American Association of Colleges of Pharmacy in the matter of "sane, adequate revision of the Pure Food and Drug Act" and of its vote favoring "Senate Bill No 2800 or a measure of greater merit" at its convention last May. At a meeting of the National Drug Trade Conference, Dean DuMez set forth the position of the Association in a statement of the more important provisions which should be incorporated in any new legislations. These provisions are quoted in full.—E LITTLE *J Am Pharm Assoc*, 24 (1935), 61 (Z M C)

MISCELLANEOUS

Hospital Pharmacy Practice—Innovation in The author tells something of the work which led up to the publication of the Intern's Handbook, something about the book itself, information

as to pharmacy service and its regulations Procedure in issuing drugs is described and general pharmaceutical organization—J S MORDELL *J Am Pharm Assoc*, 24 (1935), 50

(Z M C)

Pharmaceutical Specialties—Necessity of Controlling A general discussion of the development of medicinal preparations is given, several official standards being mentioned In 1920 the government of Netherlands set up an official Institute for pharmacotherapeutic research which in the past few years has been hampered by reduced appropriations The work of the Institute, however, has shown the prevalence of untruthful advertising The Institute holds a monopoly on the manufacture of certain foreign specialties, tests medicaments not evaluated by physiological means, and sends monographs and other information to both pharmacists and physicians No one may use the name of the Institute in advertising without permission from it nor without compliance with the regulations set up by the Institute In 1932 the Swiss Society of Pharmacy organized a laboratory for the control of medicaments, which laboratory analyzes drugs chemicals and specialties A discussion of the American system of control of proprietaries is undertaken, enumerating the rules set down by the Council of the Am Med Assoc for recognition in New and Non official Remedies—L DAUTREBANDE and E ZUNZ *Schweiz Apoth-Ztg*, 73 (1935) 13, 25, 37

(M F W D)

PHARMACOLOGY, TOXICOLOGY AND THERAPEUTICS

PHARMACOLOGY

Alkylhydroxybenzenes—Anthelmintic Studies on I Alkylpolyhydroxybenzenes A series of alkylpolyhydroxybenzenes have been studied for their anthelmintic and toxicological actions Hexylresorcinol was especially studied Although this substance is toxic to cats, it is relatively non toxic to rats, dogs and man From extensive studies the authors conclude that hexylresorcinol is probably the best substance to be used against human ascaris and hookworm In amounts of 0.1 Gm per year of age up to an adult dose of one gram hexylresorcinol removes 90-100 per cent of the ascaris parasites It is somewhat less effective against hookworm—P D LAMSON, H W BROWN and C B WARD *J Pharmacol and Exper Therap*, 53 (1935), 198

(E C L M)

Alkylhydroxybenzenes—Anthelmintic Studies on II Ortho- and Para-*n*-alkylphenols This paper is a continuation of the systematic study of anthelmintics Of the several mentioned in this series *o*-*n* heptylphenol was found to produce no gross or microscopic lesions after an oral administration of 3-cc doses to dogs Upon man in doses four times as great as hexylresorcinol it removed 38% *Ascaris lumbricoides*, 58% *Necator americanus* and 32% *Trichuris trichiura*, compared with 90 to 100 per cent 70 to 80 per cent and 30 to 50 per cent removed by hexylresorcinol—P D LAMSON, *et al* *J Pharmacol and Exper Therap*, 53 (1935), 218

(E C L M)

Alkylhydroxybenzenes—Anthelmintic Studies on III 6-*n*-Alkyl-meta-cresols The complete series of 6 *n* alkyl-*m*-cresols from cresol through 6 *n* decyl *m* cresol was studied for their anthelmintic and toxicological properties both upon animals and man 6 *n*-Hexyl *m*-cresol is a less effective ascaricide than hexylresorcinol in man—P D LAMSON and H W BROWN *J Pharmacol and Exper Therap*, 53 (1935) 227

(E C L M)

Alkylhydroxybenzenes—Anthelmintic Studies on IV Isomerism in Polyalkylphenols This is a study of polyalkylphenols including their ascaricidal properties and local irritant effects No single substance reported in this paper shows combined properties of ascaricidal effect, toxicity and local irritant action which would indicate that it would be a more practical human ascaricide than hexylresorcinol—P D LAMSON *et al* *J Pharmacol and Exper Therap*, 53 (1935), 234

(E C L M)

Alkylhydroxybenzenes—Anthelmintic Studies on V Phenols with Other Than Normal Alkyl Side Chains A series of alkylphenols with other than normal alkyl side chains has been synthesized and studied for their ascaricidal properties None is as active ascaricidally as hexylresorcinol—P D LAMSON, *et al* *J Pharmacol and Exper Therap*, 53 (1935), 239

(E C L M)

Camphor—Comparison of Toxicity and General Actions of Natural and Synthetic, on Guinea Pig Samples of natural official dextrorotatory camphor and racemic synthetic camphor

were tested on guinea pigs of from 300 to 750 Gm To overcome variations due to the animal, several sets of four each were taken for each dose Warm solutions of camphor of about 10% were tested Results showed synthetic camphor to be more toxic than natural camphor The smallest dose causing death in the case of synthetic being 1.60 Gm, as compared to 1.90 Gm for the natural Symptoms of intoxication were produced by 0.3 Gm of synthetic as compared to 0.7 Gm of natural Although the symptoms of intoxication were of the same order, nevertheless, convulsions were more severe in the case of the synthetic camphor—R HAZARD and R LARDÉ *J pharm chim*, 21 (1935), 97 (M M Z)

Cinchophen and Tolsyn—Elimination of Uric Acid from Rats' Liver by Action of The maximal effect in decreasing the uric acid content in the livers of rats for phenylcinchoninic acid (cinchophen) and the ethylester of paramethylphenylcinchoninic acid (tolsyn) was about 0.01 Gm per Kg body weight orally daily A noticeable effect on the output of uric acid was obtained by the administration of 0.0008 Gm daily This corresponds to about 0.05 Gm for a seventy Kg human adult When the amount of these drugs was increased to 0.02 Gm there was a slightly greater loss in body weight than for controls upon the same diet A very severe loss of body weight to the extent of from 18% to 20% was noticed after the daily administration of 0.6 Gm of tolsyn or 0.2 Gm of cinchophen Free phenylcinchoninic acid therefore proved to be far more toxic than the ester—O FÜRTH and E EDEL *J Pharmacol and Exper Therap*, 53 (1935), 105 (E C L M)

Croton Resin—I Toxicity Studies Using Goldfish The resin was isolated from the methanol extract of the croton bean by a modification of the process of Cherbuliez The relative toxicities of croton oil, the alcohol soluble portion of the oil and croton resin were tested on gold fish The resin is shown to be more toxic than rotenone—J R SPIES *J Am Chem Soc*, 57 (1935) 180 (E B S)

Croton Resin—II Toxic and Vesicant Action of Certain of Its Derivatives Hydrogenation of croton resin with nickel and platinum reduced the iodine number from 53 to 38 but did not decrease the toxic or vesicant action Bromination decreased these properties Complete methylation of the hydroxyl group produced a physiologically inactive resin Goldfish were used in the tests—J R SPIES *J Am Chem Soc* 57 (1935) 182 (E B S)

Digitalis—Assay on Normal and Exsanguinated Cats It has been found that when digitalis preparations are assayed on a cat in which blood has been replaced by physiological saline, the lethal dose is smaller than that required for a normal cat There seems to be indication that the active principles of digitalis may combine with the proteins of the blood to render them less potent but this has not yet been established—D I MACHT *J Am Pharm Assoc* 24 (1935) 15 (Z M C)

Digitalis Lanata and D. Purpurea—Pharmacological Action of The activity of *D. lanata* is 25 per cent greater than that of *D. purpurea* The activity is maintained for a year in carbon dioxide gas The activity of *D. lanata* treated with chloroform and dried in hot air is less than when it is dried at room temperature—A RABBENO and O MARINI *Arch int Pharmacodyn*, 48 (1934), 297, through *Physiol Abstracts*, 19 (1935), 615

Dinitrophenol—Metabolic Activity of Compounds Related to In summarizing their studies the authors conclude as follows 1 Fifty compounds chemically related to 2,4 dinitrophenol have been tested for power to stimulate metabolism in rats pigeons and dogs, using changes in body temperature as an index to the metabolic changes 2 When either the hydroxyl or nitro groups of 2,4 dinitrophenol are modified by substitution with other groups or by change in position, the action of the compound as a metabolic stimulant is either greatly reduced or completely abolished 3 Either active or inactive compounds may be produced by adding extra groups to the dinitrophenol molecule, or by introducing nitro groups into other cyclic compounds 4 Picramic acid, dinitrohydroxydiphenyl and 2,6 dinitrophenol were found to produce increases in temperature, but only to small degrees 5 2,4 Dinitro α naphthol was found to be inactive in rats, but 25 per cent more toxic in pigeons, for a given degree of metabolic stimulation, than dinitrophenol 6 Dinitro *o* cresol stimulated the metabolism of both rats and pigeons, but was three times as toxic in the former and 11 per cent more toxic in the latter than the dinitrophenol 7 2,4 Dinitro *o* cyclohexylphenol and the similar pentyl compound did not raise the temperature of rats Both compounds were effective stimulants in pigeons, but despite claims of about 400 per cent greater activity and a lesser toxicity than dinitrophenol, they were found to

require about the same absolute dose as the latter drug for a given degree of response. Their toxicities were only 15 per cent and 4 per cent less, respectively, than the toxicity of dinitrophenol. 8 The relative values of these active compounds for human therapy must, therefore, be decided on the basis of their freedom from undesirable side actions, since the pharmacologic evidence is contradictory, or indicates insignificant differences between them. Some of the more important side actions cannot be tested for in animals, so that cautious clinical trials are indispensable.—M L TAINTER, F W BERGSTROM and W C CUTTING *J Pharmacol and Exper Therap*, 53 (1935), 58 (E C L M)

Disinfectants—Tests for. References are made to the Chick-Martin and rat tail tests for disinfectants. The rat tail test is briefly described and the effectiveness of various disinfectants by this method is shown. The disinfectants tested included propyl alcohol, ethyl alcohol, iodine phenol, silver nitrate, corrosive sublimate, Dakin's solution, formaldehyde, phenosallyl, hydrogen peroxide and resorcin, all at various dilutions. Propyl alcohol ranked first in effectiveness and 70 per cent alcohol second. All the other disinfectants were good only in concentrations too high for daily use.—J CHRISTIANSEN *Lancet*, 1 (1935), 114 (B S R)

Ergot—Active Constituents and a Pharmacological and Chemical Study of. Reference is made to a series of ten reports published during 1929–1930, and some of the important conclusions. The investigations have been continued for the purpose of determining whether or not the oxytocic effects of purified alkaloids are the same as the crude extracts. Pregnant cats were used as test animals and details of the method are given. The activity of hydro alcoholic extracts, aqueous extracts and salts of ergotamine and ergotamine were compared pharmacologically and pharmacologically. Since anesthetics depress gastro intestinal function, the possibility that the small dose volume of the active principles might explain delayed action was studied. Tests indicated that absorption is chiefly from small intestine. The greatest sensitivity to orally administered ergot seemed to be just preceding, during and immediately after, labor. There was confirmation that commercial salts of ergotamine and ergotamine are not wholly representative of the action of the drug or its extracts. Further investigation of a new substance obtained in hydro alcoholic extracts was demonstrated. This hydro alcoholic percolate was handled very carefully and separated into a 'total alkaloid fraction' and an 'alkaloid-free fraction'. The latter tested pharmacologically was shown to have no significant uterine activity. The 'total alkaloid fraction' tested pharmacologically was shown to contain all the significant characteristic uterine activity of ergot. It showed also that the isolated guinea pig uterus method is unreliable. General analysis of results leads the author to believe that crude extracts probably owe superior activity to an unidentified substance. This new substance behaves like an alkaloid and should be classed as a new member of the "total specific alkaloids of ergot"—M R THOMPSON *J Am Pharm Assoc* 25 (1935), 24 (Z M C)

Ergot—U S P Assay for. A note on the revision of the assay process for ergot and fluidextract of ergot, U S P. The revision was made during 1933, and became official in the United States on January 1, 1934. Ergotamine ethanesulphonate was adopted as the official ergot standard.—ANONYMOUS *Pharm J*, 134 (1935), 61 (W B B)

Ergotamine Tartrate—Effect of, on Cerebral Circulation of Man. The striking effect of ergotamine tartrate in the treatment of migraine lead the authors to investigate the physiological action of this drug upon human subjects with especial reference to its action on the intracranial circulation. The drug was given in doses from 0.25 to 0.5 mg intravenously to unanesthetized patients. In most cases the drug produced a moderate increase flow of blood through the brain. This increase was probably secondary to an increase in systemic blood pressure. These findings do not explain the relief of headache which follows the injection of this drug.—W G LENNOX, E L GIBBS and F A GIBBS *J Pharmacol and Exper Therap*, 53 (1935) 113 (E C L M)

Insulin—Quantitative Determination of, in Fluids, Tissues, etc. Seven methods for the quantitative determination of insulin are reviewed critically. The four methods approved are those of Fisher and Noble, Mauzeri, Baker, Dickens and Dodds, and Blades and Adams.—O KAUSCH *Pharm Ztg* 80 (1935), 33 (G E C)

Insulin Preparations—Standardization of. The first blood test after insulin injection is made after 1 hour and 30 minutes by the Toronto method. At that time, the blood sugar has passed through the minimum and is ascending again. It was found that the lowest level is obtained at 45 minutes. The quantities injected were 0.75 and 1.0 international unit per 2 Kg.

animal, calculated approximately and given intravenously. The dose was reduced or increased in accordance with the deviation weight from 2 Kg, this factor being avoided in the final calculation. It was found by comparison with an international standard, that this method gives perfect agreement with the Toronto method. The sugar was determined by the method of Hagedorn Jensen.—C. COLOMBI, M. LONG and A. TOSATTO *Biochem. Therap. sper.*, 21 (1934), 378, through *Chem. Abstracts*, 29 (1935), 551.

Morphine and Dilaudid (Dihydromorphinone Hydrochloride)—Comparative Study of Actions of, on Intact Small Intestine of Dog. The authors studied the effect of morphine and dilaudid upon the ileum and jejunum of dogs and found that the minimal effective intravenous dose for jejunal effect of dilaudid hydrochloride was about 0.0002 mg X Kg body weight while that of morphine sulphate was 0.002 mg. For the ileum 0.0003 mg of dilaudid hydrochloride and 0.003 mg of morphine sulphate was needed. In small and medium doses dilaudid hydrochloride was ten times as effective as morphine sulphate. Further comparisons of these drugs were made in varying doses upon the tonus and the amplitude and number of rhythmic contractions of the intestines under various conditions.—C. M. GRUBER and J. T. BRUNDAGE *J. Pharmacol. and Exper. Therap.*, 53 (1935), 120 (E. C. L. M.)

Morphine, Codeine and Related Substances—Respiratory Effects of. III. Effect of Morphine, Dihydromorphine, Dihydromorphinone (Dilaudid) and Dihydrocodeinone (Dicodid) on Respiratory Activity of Rabbit. Morphine, dihydromorphine, dilaudid and dicodid were given subcutaneously to rabbits and a comparison made as to the effectiveness of these compounds in decreasing the rabbits' respiratory rate, minute volume and sensitivity to stimulation by carbon dioxide. The minimum dose (per Kg body weight) of the base required to decrease the respiratory activity was found to be as follows: morphine 0.32, dihydromorphine 0.22 to 0.27, dilaudid 0.027 to 0.035 and dicodid 0.21 to 0.30.—C. I. WRIGHT and F. A. BARBOUR *J. Pharmacol. and Exper. Therap.*, 53 (1935), 34 (E. C. L. M.)

Sunburn Preventives—Standard for, and a Method of Testing. Using the reaction of the skin as an indicator, a definite reading may be obtained as to how the product concerned will protect the skin and to what degree. The author uses the method based on this reaction, known as "Erythema Reaction". The anterior portion of the forearm is exposed to a 550 watt quartz mercury lamp for twenty minutes. For best results the burner itself should be horizontal and not less than 3 inches long corresponding exactly with the length of the field being radiated. The method for the evaluations of results is given in detail.—L. STAMBOVSKY *Perf. and Ess. Oil Rec.*, 26 (1935), 3 (A. C. DeD.)

Vitamin A—Determination of, Values by Method of Single Feedings. The potency of samples of carotene, cod liver oil, kale and calf liver as sources of vitamin A was tested on rats depleted of vitamin A by feeding a single dose and observing the effect on growth and survival time. This method was found to give quite as reliable results as the more laborious method of daily feeding. It has the advantage of eliminating the possibility of deterioration of the activity of the preparation being tested during the course of the assay.—H. C. SHERMAN and E. N. TODD HUNTER *J. Nutrit.*, 8 (1934), 347, through *Physiol. Abstracts*, 19 (1935), 589.

Yeasts—Quantitative Determination of Biologic Value of Medicinal. Methods for determining the activities of medicinal yeasts are critically reviewed. Standardization of yeast products is urged and requirements to be met are suggested.—A. J.-J. VAN DE VELDE *J. Pharm. Belg.*, 17 (1935), 1, 21 (S. W. G.)

TOXICOLOGY

Amidopyrin—Agranulocytosis Due to. Both experimental and clinical evidence is reported. Amidopyrin in therapeutic doses produces a marked fall in the granulocyte and other blood cell counts of sensitive individuals. This action takes place in one to two hours. At present it is not known whether an allergic condition is developed or whether certain individuals are permanently hypersensitive or are merely hypersensitive at certain periods according to unknown conditions such as hormonal unbalance or absorption of toxins. A number of case records are reported. The greatest frequency of the disease was found in the age group of 40-49 years in women and 60-69 years in men in seventy four reported cases.—P. PLUM *Lancet*, 1 (1935), 14 (B. S. R.)

Antidotes—I General Plan The literature is being searched for information about poisons and their antidotes and laboratory studies are being made—J C MUNCH and F E GARLOUGH *J Am Pharm Assoc*, 24 (1935), 38 (Z M C)

Chromium Compounds—Toxicological Study of Some The author reports that injections under the skin of potassium bichromate cause the formation of lesions, which is due to the causticity of the compound. Small doses produced abscesses. A thorough study of the action of chromic chloride, potassium chromate and potassium bichromate was made. The action of these compounds is chiefly through the production of lesions in the skin and changes in respiration with perforations of the nasal septum. Symptoms produced in dogs and rabbits, and the amount of chromium recovered from the various organs of the animals are recorded. When bichromate is absorbed only slightly, hemorrhage occurs, and changes in respiration are observed. Chromic chloride is less toxic than the chromate or bichromate. Small doses of bichromate produced death in 2 days in the case of dogs. The author concluded that absorption in small doses of chromium compounds was definitely toxic—D BRARD *J pharm chim*, 20 (1934), 549, 21 (1935), 5 (M M Z)

Cinchophen Poisoning The author states that with proper precautions cinchophen can be taken safely. He advises taking the drug after meals with sodium bicarbonate and water. In cases where idiosyncrasies to cinchophen exist, gastric disturbance and loss of appetite are symptoms of intolerance. The drug should not be given for more than three days in succession each week unless tolerance is established. The author rarely gives cinchophen if the blood uric acid is below 4 mg per cent, since he believes that this provides an additional margin of safety. A case is cited in which a woman had taken cinchophen almost continuously for 12 years, with one dose being more than she could tolerate during the period. The administration of cinchophen was stopped until the woman recovered and then was continued with no harm to the liver—G EVANS *Brit Med J*, 1 (1935), 35 (S W G)

Codeine Addiction Three cases of codeine addiction in which withdrawal symptoms were noted after removal of the drug are reported. In two of the cases paregoric and morphine had been taken previously, but the period of time intervening should eliminate the possibility of crossed tolerance. The third case had no previous history of drug taking—D SLIGHT *Can Med Assoc J*, 32 (1935), 69 (S W G)

Emetine—Toxic Effects of Despite all precautions, emetine used in the treatment of amebiasis produced untoward effects. Emetine attacks all tissues and is therefore a general protoplasmic poison, changes in the kidney, liver, heart and skeletal muscles are identical, all showing hyperemia, cloudy swelling and degeneration of the cells. The immediate toxic dose for human adults is not known. Fatal results are to be feared with doses of 0.6 Gm, anything over 1.2 Gm is probably immediately fatal. When a therapeutic dose is injected, there is no general disturbance or gastro intestinal symptoms, local reaction is usually slight when the solution is neutral. Larger doses cause nausea, vomiting and diarrhea. These symptoms are also apparent with small repeated doses, which may also cause vertigo, extreme muscular weakness and expiratory dyspnea, the pulse rate is slow at first and then rapid. Death results from exhaustion, gastroenteritis or inter-current inflammation of the lungs. Among the serious symptoms are increased pulse-rate, listlessness and cardiac and mental depression. There may be leg weakness, muscular tremors, globus hystericus, cardiac arrhythmia, low blood pressure, edema, petechial hemorrhage, purpuric skin rash, hemoptysis signs of cerebral edema, albuminuria, polyneuritis, difficulty in swallowing and a feeling of constriction in the throat and chest. Recent investigation indicates that the drug is not a causative factor in abortion. It is generally advisable not to give the drug during menstruation—R N CHOPRA *Indian Med Gaz* (June 1934), through *J Trop Med Hyg* 38 (1935), 15

Lead—Biochemical Behavior in Body A review of pertinent literature covering the last 10 years. The absorption, mode of transport in the blood, sites of deposition or accumulation, influence upon bone metabolism and structure, and mode and rate of excretion of lead are presented—J C AUB *J Am Med Assoc*, 104 (1935) 87 (M R T)

Lead—Normal Absorption and Excretion of By suitable analysis of the food consumed and the excreta (urine and feces) of nine normal humans the daily normal lead intake was approximately 0.25 mg and the amount excreted daily was within the limits of experimental error, the same. Cumulative effects consequently do not normally occur. Chemical methods for the

determination of lead in human excreta and blood were found to yield uniformly low results, when these results were compared with those obtained spectrographically—R A KEROE *J Am Med Assoc*, 104 (1935), 90 (M R T)

Lead Poisoning—Control of, in Workers The author presents 'a clinically proved and detailed method for the control of lead poisoning in the worker at work,' based upon extensive experience with industrial lead poisoning—E L BELNAP *J Am Med Assoc*, 104 (1935), 205 (M R T)

Lead Poisoning—Epidemiology of A discussion of the sources and prevalence of lead poisoning in humans—A J LANZA *J Am Med Assoc*, 104 (1935) 85 (M R T)

Mussel Poison—Chemistry and Toxicity of The author describes a method for the isolation of mussel poison and gives some chemical characteristics of the purified product. He found that the most poisonous preparation obtained killed mice in amounts of 1.7 gamma per gram body weight upon intraperitoneal injection. Mussel poison seems to be of a basic nature and of a relative small molecular weight. It does not give any of the color tests for alkaloids. Brieger's "Mytilotoxin" does not represent the pure toxic principle of poisonous mussels—H MÜLLER *J Pharmacol and Exper Therap*, 53 (1935), 67 (E C L M)

Phenolphthalein—Accidental Overdose in a Child without Ill Effects—A single case is reported in which a 3½ year old boy consumed orally 48 two grain chocolate tablets of phenolphthalein. Although the child appeared perfectly well, the mother gave an enema, following this, the bowels moved at half hour intervals, 5 in all. Child then taken to hospital, where he vomited several times and had two more bowel movements soon after admission. No blood in stool. Temperature and pulse good. Urine passed in normal amounts and was free from albumin, sugar, casts or blood. No tests were made for phenolphthalein in the urine or faeces but the vomitus showed a few pieces of the tablets. Complete recovery from the 96 grain dose was otherwise apparently uneventful. In the absence of information as to the amount expelled in the faeces and vomiting, the amount actually absorbed could not be estimated, and hence, the information yielded by the case is of limited value as far as the toxicity of phenolphthalein is concerned—W SACHS *J Am Med Assoc* 104 (1935), 45 (M R T)

Plumbism—Recent Progress in the Treatment of Patients suffering from chronic or subacute plumbism were 'de leaded' by the feeding of low calcium high-phosphorous diets, the excretion rate being determined by urine and fecal lead. Ammonium chloride, sodium phosphate or magnesium sulphate was employed to assist excretion. The procedure was found to be effective in controlling chronic plumbism or in bringing about rapid recovery from subacute plumbism—I GRAY *J Am Med Assoc*, 104 (1935), 200 (M R T)

Plumbism—Symptoms in Early Stages of Industrial A review of the literature with discussion, with emphasis upon symptomatology valuable for early diagnosis of industrial lead poisoning—R R JONES *J Am Med Assoc*, 104 (1935) 195 (M R T)

Somnifen Poisoning—Acute The symptoms of acute poisoning with somnifen resemble those of the barbituric derivatives in general with a special action on the temperature regulating centre, causing an abrupt rise and fall of temperature. Somnifen is less toxic than veronal, and coramine is an effective antidote—H GLATZEL and F SCHMITT *Arch exp Path Pharmacol*, 174 (1934), 111, through *Physiol Abstracts*, 19 (1935), 680

(To be continued)

LEGAL AND LEGISLATIVE — *Concluded from page 254*

NARCOTIC RULES FOR VIRGIN ISLANDS REVISED

An executive order by the President has promulgated revised rules governing narcotics in the Virgin Islands. Narcotics must be obtained from qualified manufacturers or wholesalers in the continental United States. The regulations that apply follow:

Article 81 Orders—Who May Fill—An order for narcotic drugs submitted by a qualified dealer or practitioner in the Virgin Islands in accordance with the terms of the executive order may be filled only by a person duly registered, in the continental United States, in Classes 1 or 2 under Section 1 of the Harrison narcotic law, as amended, and regulations issued thereunder, except that an order for only such preparations and remedies as are considered exempt under Section 6 of said law and regulations issued thereunder may be filled by a person duly registered, in the continental United States, in Class 5 under Section 1 of said law and regulations.

Article 82 Record and Report of Sales—Each sale or other disposition of narcotic drugs under the executive order shall be recorded and reported as a domestic sale, and the person filling any such order for narcotic drugs shall enter upon form 810b or 811b as the case may be, of his monthly return the date upon which the order was approved by the commissioner of health of the Virgin Islands, in lieu of and in the space provided for the date of the purchaser's official order form. The column headed "Serial number" should be used for inserting the date of receipt of the purchaser's approved order. The columns headed "Registry number," "Class" and "District" will be left blank. If the order covers items of preparations or remedies which are considered exempt under Section 6 of said law and regulations, such items will not be reported in the monthly return, but the person filling the order for such items shall keep a record in the same manner as in the case of a domestic sale thereof, except that in lieu of the record required to be kept of the registry number of the purchaser there shall be kept a record of the date upon which the order was approved by the commissioner of health of the Virgin Islands and the date when the order was received by the person in the continental United States

filing the order—From *Oil, Paint and Drug Reporter*, Feb 18, 1935

CALIFORNIA

HYDROGEN PEROXIDE A DRUG OR MEDICINE

A manager of a pharmacy was charged with violating Section 13 of the California pharmacy practice act in that he permitted named persons, who were not registered pharmacists or assistant pharmacists to sell peroxide of hydrogen. He was found guilty in the trial court and appealed to the appellate department, superior court, Los Angeles County, California.

Section 13 of the pharmacy practice act makes it unlawful for any "proprietor" of a pharmacy to permit the sales of drugs, medicines or poisons by anyone except a registered pharmacist or assistant pharmacist. The defendant contended that since he was not a "proprietor" but a "manager," his conviction was unwarranted. The superior court held however, that a mere statement in the charge that the facts alleged constituted a violation of one section of the pharmacy practice act did not prevent the court from upholding the conviction if the acts charged were prohibited by any other section.

The defendant also argued that peroxide of hydrogen is not a drug or medicine within the meaning of the pharmacy practice act. We are satisfied, said the court, that "drug or medicine" are broad enough to include peroxide of hydrogen. It is a well-known chemical substance, listed in the United States Pharmacopœia and described in all encyclopedias.

The court stated that there "may be some difficulty in applying the pharmacy practice act to substances which have both a medical and a non medical use," but in the case of peroxide of hydrogen we are aided by the provisions of Section 16, of the act, which provides, by way of exception to the general provision of the act, that permits may be issued for the sale by unregistered persons in the rural districts of "simple household remedies and drugs," among which is listed peroxide of hydrogen. Such an exception gives rise to a strong implication that if excepted would otherwise have been within the purview of the act.

The judgment of conviction was affirmed. *People vs Arthur (Calif)*, 32 P (2d) 1002—Through *Journal A M A*

NATIONAL TUBERCULOSIS ASSOCIATION

As the major educational effort of the affiliated tuberculosis associations of the United States during 1935 will launch an Early Diagnosis Campaign on April 1st Under the slogan "Fight Tuberculosis with Modern Weapons" the need will be emphasized for prompt treatment of tuberculosis when a case is discovered and shall endeavor to familiarize the public with improvements in treatment during recent years that have greatly increased the chances for cure

NOTICE TO CONTRIBUTORS TO THE JOURNAL AMERICAN PHARMACEUTICAL ASSOCIATION.

The following notice has been prepared from comments received from members of the Board of Review of Papers and of the Publication Committee

Manuscripts should be sent to Editor E G Eberle, 2215 Constitution Ave, N W, Washington, D C

All manuscripts should be typewritten in double spacing on one side of paper 8½ x 11 inches, and should be mailed in a flat package—not rolled The original (*not* carbon) copy should be sent The original drawings, not photographs of drawings, should accompany the manuscript Authors should indicate on the manuscript the approximate position of text figures All drawings should be marked with the author's name and address

A condensed title running page headline, not to exceed thirty-five letters, should be given on a separate sheet and placed at the beginning of each article

The method of stating the laboratory in which the work is done should be uniform and placed as a footnote at end of first page, giving Department, School or College The date when received for publication should be given

Numerals are used for figures for all definite weights, measurements, percentages, and degrees of temperature (for example 2 Kg, 1 inch, 20.5 cc, 300° C) Spell out all indefinite and approximate periods of time and other numerals which are used in a general manner (for example one hundred years ago, about two and one half hours, seven times)

Standard abbreviations should be used whenever weights and measures are given in the metric system, e g, 10 Kg, 2.25 cc, etc The forms to be used are cc, Kg, mg, mm, L and Ml

Figures should be numbered from 1 up, beginning with the text figures (line engravings are always treated as text-figures and should be designed as such) and continuing through the plates The reduction desired should be clearly indicated on the margin of the drawing All drawings should be made with India ink, preferably on white tracing paper or cloth If coordinate paper is used, a blue lined paper must be chosen Usually it is desirable to ink in the large squares so that the curves can be more easily read Lettering should be plain and large enough to reproduce well when the drawing is reduced to the width of a printed page (usually about 4 inches) Photographs intended for half tone reproduction should be securely mounted with colorless paste

"Figure" should be spelled out at the beginning of a sentence, elsewhere it is abbreviated to "Fig," per cent—2 words

The expense for a limited number of figures and plates will be borne by the JOURNAL, expense for cuts in excess of this number must be defrayed by the author

References to the literature cited should be grouped at the end of the manuscript under the *References* The citations should be numbered consecutively in the order of their appearance (their location in the text should be indicated by full sized figures included in parentheses) The sequence followed in the citations should be Author's name (with initials), name of publication, volume number, page number and the date in parentheses Abbreviations for journals should conform to the style of *Chemical Abstracts*, published by the American Chemical Society

(1) Author, A Y, *Am J Physiol*, 79, 289 (1927)

Papers presented at the Sections of the AMERICAN PHARMACEUTICAL ASSOCIATION's annual meeting become the property of the Association and may at the discretion of the Editor be published in the JOURNAL Papers presented at these Sections may be published in other periodicals only after the release of the papers by the Board of Review of Papers of the JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

The Editor will appreciate comments from Board of Review and Committee on Publication members, authors and others interested

NATIONAL PHARMACY WEEK

The eleventh annual observance of the National Pharmacy Week movement will be held during the week of October 21st. It has been advisable to change the date to two weeks later than in previous years so as to allow the colleges of pharmacy greater opportunity to participate. In the past very little time elapsed between the opening dates of the scholastic year and Pharmacy Week.

The tenth annual observance for the year 1934 was more widely participated in by retail pharmacists than for many years. The office of the National Pharmacy Week Executive Committee was flooded with requests for copies of the human interest appeal stories. It is gratifying to note that many pharmacists are utilizing materials of this kind throughout the entire year by arranging for presentation of these talks before various community organizations.

An outstanding event of the 1934 observance was the splendid radio address delivered by President Robert P. Fischelis, of the AMERICAN PHARMACEUTICAL ASSOCIATION, over a nationwide hookup. Radio addresses were delivered by retail pharmacists and educators in many sections of the country.

The Robert J. Ruth Memorial Trophy, a silver loving cup donated by the Federal Wholesale Druggists' Association, through Secretary Lee Williamson has been awarded to Apothecaries Hall, New Haven, Connecticut. The 1934 National Pharmacy Week Window Display Contest Committee was composed of leading members of the Drug Trade Industry of New Orleans, with Professor John McCloskey serving as chairman.

The National Pharmacy Week movement is now entering upon its second decade of life which speaks well for those who have been responsible for the success of same. It has gone forward for a decade growing in strength year by year and has been kept within the tenets and precepts of the ideals as laid down by its founder. Throughout the country retail pharmacists are devoting more thought and attention to the professional aspects of their daily activities which no doubt is due in a large measure to the activities of the Pharmacy Week movement.

The National Pharmacy Week Executive Committee is now at work on the plans for the 1935 observance which beyond a doubt will prove to add another mile-stone to the success of a movement that has done much for the profession of pharmacy in bringing its message to members of allied professions and to the laity.

The National Pharmacy Week Executive Committee urges retail pharmacists to begin planning now for the professional window display that they are contemplating featuring during the week of October 21st. An attractive and interesting professional window display requires of the pharmacist a review of the literature of the subject selected, followed in turn by preparation of well worded copy for show-cards, assembling of materials and, finally, the arrangement in a dramatic manner.

Pharmacy as a profession is replete with romance and many great achievements in its interesting history and it is hoped that thousands of retail pharmacists will browse through the dust laden archives and bring to light many of these interesting stories by means of professional window displays and talks before various community organizations.

ANTON HOGSTAD JR., *Chairman*



WILLIS G GREGORY

JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

VOL XXIV

APRIL, 1935

No 4

WILLIS G GREGORY

Willis George Gregory is concluding his 50th year of membership in the AMERICAN PHARMACEUTICAL ASSOCIATION. He was chairman of the first and second editions of the Pharmaceutical Syllabus, prepared by the National Pharmaceutical Syllabus Committee, he is the senior pharmacy dean of the American schools of pharmacy, and for 20 years he has been a member of the New York State Pharmacy Council in the State Education Department. He was a member of the Revision Committee of the United States Pharmacopœia, 1890-1920, a former president of New York State Pharmaceutical Association of which he is a life member, and for 33 years has been a member of the New York State Board of Pharmacy. When the AMERICAN PHARMACEUTICAL ASSOCIATION met in Buffalo, in 1924, Professor Gregory served as local secretary.

Willis G. Gregory was born April 19, 1857, the son of Willis Lathrop and Frances (Beach) Gregory, the seventh generation from John Beach ("Ye Pilgrim") of New Haven, Conn. He received his early education in Buffalo, the degree of M.D. from the University of Buffalo, in 1882, and graduated in pharmacy in 1886. Professor Gregory became a member of the pharmacy faculty, University of Buffalo, in 1886, and was elected dean in 1890, which office he still holds.

The subject of this brief sketch entered pharmacy in 1869 as apprentice in the pharmacy of his father, became a partner and, in 1887, proprietor until he retired in 1912. He has been active in local and state pharmaceutical organizations, is a member of the American Association of University Professors and of the Council (Trustees) of the University of Buffalo.

Dr. Gregory married Gertrude Fargo, of Buffalo, April 14, 1885, they had four children, two of whom are living—Louise, born 1890, and Frances, born 1901.

EDITORIAL

E G EBERLE, EDITOR

2215 Constitution Ave., WASHINGTON, D C

SIXTH INTERNATIONAL CONGRESS OF MILITARY MEDICINE AND PHARMACY

THE report of Commander William Seaman Bainbridge for the delegation from the United States has been issued in book form as Conference Series No 12 of the Department of State, the Foreword is by the Surgeon General of the U S Army, Robert U Patterson

Among the contributors to the Congress were Carlo Gorreta, Major Pharmacist-Chemist, Italy, Pharmacist-Colonel Morreau and Pharmacist-Commandant Raynaud, France, Jules Thomann, Colonel-Pharmacist of the Swiss Armies, Switzerland Among the official delegates holding military titles and positions as pharmacists were I Etienne and W Proot, Belgium, G H Barthet, F Chaput, A Saint-Sernin, France, S Krupinski, Poland, Guerrero Rafael Roldan, Spain, J Thomann, Switzerland Other officers were present but not distinctively mentioned as pharmacists

Among the conclusions unanimously adopted were "The training of the military medical officer and pharmacist must embrace the medical or pharmaceutical science and military instruction The training of military medical officers and pharmacists must be entrusted to the civilian faculties It is desirable that throughout their career, military medical officers and pharmacists should attend courses of instruction in both professional and military subjects "

Military-Pharmacist, First Class, L J Roehner, of the Netherlands, contributed a paper on the preparation and storage of medicinal ampuls Chief Pharmacist, Colonel G Grintzesso and Captain J Bibesco, Rumania, made a report based on a selection of the most practical, expeditious and reliable methods for the preparation of injection solutions Chief Pharmacist-Chemist, First Class, A Saint Sernin, France, contributed a tabulation of twenty-one medicinal ampuls in use in the French Navy, with data on their mode of sterilization and the length of time of their preservation, ranging from six months to three years Pharmacist-Colonel Morreau and Pharmacist-Commandant Raynaud, France, reported on the preparation and preservation of medicinal ampuls in use in the service of the Armies on land and sea Chemist-Pharmacist Colonel Filippo Suzzi, Italy, briefly summarized the contributions made during about thirty years by the Italian Military Medical Service, through its investigations, methods and appliances of the many problems of pharmaceutical technique, with respect to the preparation and preservation of medicinal agents for hypodermic use, and with special reference to studies along the line of composition of the glass for the flasks Major Pharmacist-Chemist Carlo Gorreta, Italy, gave a résumé on the preparation and preservation of ampuls in use by the Auxiliary Service of the Armies and Navies Colonel Thomann, Pharmacist-in-Chief in the Swiss Army, reported on the preparation and preservation of ampuls and fluids for injection

These comments are of necessity very brief, the reports and papers go into careful detail and testify to an essential service by pharmacists in the armies and navies which, unless reported, fail to receive proper credit

The Eighth International Congress of Military Medicine and Pharmacy will be held in Brussels, June 27th to July 3rd

HOSPITAL DISTRIBUTION AND HOSPITAL SERVICE

THE issue of the *Journal of the American Medical Association* for March 30th is the annual Hospital Number—always an informative publication, the issue of this year presents the report more comprehensively and represents a most valuable service of the Council on Medical Education and Hospitals. The maps give what may be termed a bird's-eye view of the hospital distribution, and enables those who study the situation to make deductions relative to the service rendered and the distribution of the institutions, geographic and otherwise.

The *Journal* comments editorially on the development of hospitals in rural and urban areas and makes deductions relative to the need of further extension, and also points out the possibilities of going beyond the needs of hospital requirements when compared with the demand and support for the institutions. This comment is to express appreciation of the annual study and the service rendered by the *Journal of the American Medical Association*.

VARIATION IN THE CONTRIBUTORY HARMFULNESS OF PETROLEUMS

THE Manchester Cancer Committee is investigating petroleum oils and tars from the standpoint of their harmfulness as contributory causes of cancer. It seems that two oils from the same region rarely exhibit identical potencies, but the report is that the oils of some sections are less harmful than that of other territories. It may still be questioned whether the classification has gone far enough to report results definite and accurate, however, foundation has been laid by Dr. C. C. Twort for further research which will interest investigators of our profession and other research workers. The investigations may lead to discoveries other than the causes for high mortality from cancer in oil fields and petroleum refineries.

A BILL FOR EXTENDING THE LIFE OF THE NRA

S. 2445 (by Senator Harrison) seeks to extend the life of the NRA. Cooperating, by delaying a decision on the constitutionality of the National Industrial Recovery Act, the Solicitor General will ask (?) the Supreme Court to dismiss the government's own appeal in the Belcher case. "After the dismissal of the appeal, the Supreme Court's docket will not include any case in which that tribunal might have the opportunity of deciding a broad issue relating to the National Recovery Act." There seems, therefore, no immediate prospect of a final decision by the Supreme Court in an NRA case.

Press opinions are to the effect that the decision was reached as being preferable to have flaws in the measure removed by legislation rather than to risk a decision by the Supreme Court holding the present statute invalid on the ground of an unconstitutional delegation by Congress of its legislative authority and thereafter remedy the defect. Seemingly, this action delays enforcement of the codes in certain particulars, on the part of a minority there is a purpose to proceed with the appeal of the Belcher case. (This comment was written prior to court action.)

SCIENTIFIC SECTION

BOARD OF REVIEW OF PAPERS—*Chairman*, F E Bibbins, George D Beal, L W Rising, H M Burlage, L W Rowe, John C Krantz, Jr, Heber W Youngken

THE QUANTITATIVE DETERMINATION OF ALKALOIDS WITH BROMINE *

BY ROBERT A HATCHER AND ROBERT L HATCHER

Hart (1) reported that one molecule of quinine in solution absorbs four atoms of bromine, and that the former could be estimated quantitatively by means of *N*/10 bromine solution, 1 cc of which is decolorized by 81 mg of quinine

Weiss and Hatcher (2) described a method for the quantitative estimation of small amounts of quinine and quinidine in pure solutions and in those which contain extracts of tissue, by means of an aqueous solution of bromine. The method depends on the absorption of the bromine, the end-point being the disappearance of the yellow color. Haag (3) reported that this method may be used for the quantitative determination of brucine, caffeine, cinchonidine, procaine, strychnine, theobromine and certain other alkaloids, but that it is not available for the estimation of atropine, cocaine, morphine, sparteine and certain other alkaloids

In the course of studies involving the quantitative estimation of morphine in extracts of animal tissues, it was found that the presence of very small amounts of impurities sometimes interfered with the quantitative colorimetric determination of morphine by means of Marquis' reagent, and it was decided to investigate the availability of bromine solution for the estimation of morphine and various other substances

TECHNIQUE

The general method is as follows. Dilute 1 volume of the official (U S P X) *N*/10 bromine solution with 9 volumes of distilled water. Dissolve the substance to be tested in distilled water, in the case of alkaloids in the proportion of $\frac{1}{400}$ of the molecular weight in grams in 1 liter. Place 1 cc of *N*/100 bromine solution in each of a series of colorless or greenish (not yellowish) test tubes of about 18 cc capacity and of about 11 mm diameter, add the solution of the substance to be tested in successively increasing volumes, then add 0.3 cc of about 12 per cent HCl to each tube, and after the reaction is complete (or after thirty minutes), observe in which tubes the color of bromine persists. The tube is held at right angles to the light, preferably from a northern exposure—not in direct sunlight—and the solution is observed transversely. The end-point is the mean of the largest volume which fails to discharge the color of bromine and the smallest volume which decolorizes it completely. If a greater degree of precision is necessary, the experiment is repeated with less difference in the successive volumes of the solution added to the bromine solution. Solutions of the substance of known concentrations, which in every case should approximate that of the one being examined, should be used in exactly the same way as a control. Moderately dilute solutions of all substances the concentrations of which were not known to the observer, were used, the strength of the controls being known. Solutions of greater dilutions, differing in concentration by 10 per cent, and designated only by letters 'A' 'B' and 'C,' were classified correctly by the test. The combining powers of alkaloids vary; for example one molecule of cinchonidine decolorizes two atoms of bromine, one molecule of procaine de

* From the Department of Pharmacology, Cornell University Medical College New York

City

Received February 23, 1935

colorizes four, in moderate concentration, but the proportions are less exact with increasing dilution. That concentration which combines quantitatively with an equal volume of $N/100$ bromine solution is conveniently termed the "Standard Solution" of that particular substance. The concentrations of such "Standard Solutions" vary from 1-447 in the case of cinchonine, to 1-5850 in the case of antipyrine.

As little as 0.1 cc of $N/1000$ bromine may be used for testing substances in very low concentrations. Where the concentration of bromine in the mixture of reagents is less than that of $N/5000$, 0.5 cc of about 24 per cent HCl is used, and an interval of at least ten minutes is allowed for the release of the bromine and its combination with the substance to be tested.

A preliminary test for solutions of moderate concentration is made as follows. To 1 cc of $N/100$ bromine solution in a test-tube, add 0.3 cc of 12 per cent HCl, then the solution to be tested is added slowly from a pipette graduated in $1/100$ cc until the color of bromine is discharged. In order to facilitate the detection of the least tinge of color due to bromine, comparison is made with a control in which there is a slight excess of the substance under examination. The average of several tests is taken. For some substances this test is about as accurate as either of the modified methods.

First Modification—After the reaction is complete, 0.25 cc of chloroform is added and the tube is shaken. Any free bromine is taken up by the chloroform, which assumes a yellowish tint. In some cases the end-point in the first method is obscured by the development of color. In such cases the use of chloroform is necessary, but even this fails in those cases where the color other than that of bromine appears in the chloroform.

Cloudiness develops slowly in the chloroform in the presence of a trace of bromine, too slight to afford a tint, but since cloudiness is also induced under conditions that cannot be controlled, it was utilized in only a few tests. It may afford an extremely delicate test under conditions that avoid the disturbing factors.

Second Modification—In some cases with moderate concentration, and in all cases with very low concentration, neither the general method nor the use of chloroform affords satisfactory results, in such cases a fraction of a milligram of apomorphine is added, and the test-tubes are shaken. A trace of free bromine (about 1-600,000) is indicated by a pink color appearing within thirty seconds. The mean of the results of several determinations is accepted as the end-point. Immediately after the addition of the apomorphine the observation is made obliquely downward through the solution. As previously stated, rather rigid control solutions are necessary, hence one must know roughly the concentration of the solution under examination.

The following factors concerned with the technique have received consideration.

1 Time of Reaction

- (a) Substances which react slowly with bromine may require thirty minutes after the addition of HCl.
- (b) The chloroformic extraction of free bromine requires from a few seconds to one minute.
- (c) Apomorphine reacts rapidly with free bromine and since it displaces some substances slowly the mixture is observed within thirty seconds.
- (d) The rate of the reaction of codeine sulphate, heroine hydrochloride and morphine sulphate is accelerated by H_2SO_4 , the acceleration increasing with the concentration of H_2SO_4 .

2 Concentrations

- (a) Bromine in very dilute solutions is extracted imperfectly by chloroform, and less than 1 in 600,000 is not detected even with apomorphine, hence the comparison of a very dilute solution of unknown concentration with a much more concentrated control would result in a large error
- (b) The concentration of HCl required to liberate bromine rapidly varies with the concentration of the latter, but an excess of HCl should be used, the optimum being 0.3 cc of 12 per cent HCl per cc of $N/100$ or $N/1000$ Koppeschaar, very low concentrations of the solutions require as much as 0.5 cc of 20 per cent HCl
- (c) There is no exact limit to the dilution of a substance which may be estimated with a bromine solution, since the error increases with dilution. It is not usually feasible with chloroform to employ a solution of less than Standard/100 ($1/100$ the concentration of that which decolorizes an equal volume of $N/100$ bromine solution). When apomorphine is used without the addition of chloroform, the concentration in some cases may be Standard/400

3 Volatilization of Bromine

- (a) The loss of bromine through volatilization depends partly on the volume, more on the depth, of the solution. The loss is negligible with rapidly reacting substances but must be considered with those which react slowly. The loss of bromine is minimized by adding the HCl after having added the solution to be tested. Heat accelerates the reaction but it may increase the loss of bromine. Brucine sulphate and codeine sulphate were estimated at 25° and 32° C with an interval of thirty minutes for completing the reaction. In each case there was a difference of about 5 per cent due to the greater loss of bromine at the higher temperature. Slight differences of temperature are not important in estimating substances which react rapidly with bromine.
- (b) The loss of bromine is one of the chief objections to the use of the unofficial solution of bromine which Weiss and Hatcher employed. This may be minimized by using a micro-burette having a three-way stop cock connected with an all-glass syringe. The tip of the syringe must be in contact with the intake of the burette in order to avoid the action of bromine on rubber tubing.

4 Illumination

Light and the background influence the precision of borderline observations. Daylight, and electric light with a blue lamp are satisfactory. White, unglazed paper affords the best background.

5 Cloudiness in the Chloroform

This appears eventually in the chloroform in solutions in which there is one part of free bromine in two millions, but it was of little value in our experiments because it occurred at times from unknown causes. It appears in chloroform underlying water when concentrated HCl is added, but not when chloroform is added to any concentration of HCl. Occasionally a tinge of color of unknown origin (having no relationship to the presence or absence of free bromine) appeared in the chloroform.

The simple description of the technique and statements of the approximate average error in the estimations of various substances would make the method appear more simple and accurate than it will be found in individual cases unless one has had practice, and will devote the necessary time to the estimation. The results presented here are based on a very large number of experiments involving many thousands of test-tube examinations.

Amidopyrine—The simple decolorization method proved more satisfactory than the chloroform modification in the estimation of concentrations up to 1-30,000. For more dilute solutions this method is not practical. When an excess of amidopyrine is added a purple color may appear, irregularly it fades after a few minutes.

The chloroform modification is less satisfactory because of the pink color which appears in the chloroform and interferes with borderline observations, it also interferes with the apomorphine test when apomorphine is added after chloroform, but not if the chloroform is omitted.

It is probable that concentrated solutions (up to about 1-5000) may be estimated with errors of 3 per cent by the decolorization method, the error being slightly greater with chloroform. Apomorphine without chloroform affords a more accurate and more delicate test, and it was used satisfactorily with concentrations as low as 1-700,000.

Antipyrine—The reaction requires about two minutes. The error with chloroform may be as high as 2 or 3 per cent for concentrated solutions because of the development of a slight color. Less of antipyrine than of any other substance used is required to decolorize 1 cc. of bromine solution, and satisfactory estimations of it in concentration of 1-1,200,000 were made with apomorphine.

Apomorphine Hydrochloride—The reaction with bromine begins at once but it requires some time for its completion when only traces are present. A pink or intense red color develops dependent on the concentration, the chloroform takes up part of this color which interferes with the precision of the observations. One part of bromine in 600,000 parts of water may be detected with an excess of apomorphine. One part of apomorphine in 1,200,000 parts of water affords a pink tint with an excess of bromine. This affords a means of determining roughly the amount of apomorphine present in solution.

Brucine Sulphate—The reaction requires about thirty minutes, and a slight color develops in the solution, hence the simple decolorization method is unsatisfactory. The chloroform modification affords a satisfactory result. Apomorphine is useful with concentrations of 1-40,000, or less but not with much more concentrated solutions of brucine.

When brucine sulphate is added after the addition of HCl to bromine solution, a pink color develops immediately and changes rapidly to yellow, then to orange, and finally to pink with an excess of brucine sulphate. Hence it is possible to estimate the amount of brucine sulphate by this method. After the addition of chloroform the supernatant liquid in all tubes remains, or becomes, deep pink.

Caffeine—The reaction requires about twenty minutes and the solution develops a slight color, hence the simple decolorization method is unsatisfactory, but the chloroform and apomorphine modifications afford satisfactory results. After the addition of chloroform a slight color appears in the chloroform. This must be disregarded, but it interferes only slightly with the observation of borderline cases. Dilutions up to 1-165,000 were estimated by both modifications with moderate errors.

Codeine Sulphate—The reaction requires about thirty minutes. The chloroform and apomorphine modifications may be used for the estimation of concentrations of about 1-100,000. Apomorphine was not used with more dilute solutions. The decolorization method is unsatisfactory because of the development of a yellow color. In general, codeine behaves about like morphine.

Cinchonidine and Cinchonine—The reaction is almost instantaneous. Solutions of 1-1000 may be estimated with an error of less than 1 per cent. In concentration of 1-100,000 the error is about 5 per cent. There was no appreciable difference in the results when these alkaloids were dissolved in 0.1 per cent, or 1.6 per cent sulphuric acid.

In a few experiments with cinchonine and some other substances a green color was observed in some of the test-tubes after the addition of apomorphine, this was not investigated further

Dionine—The reaction occurs slowly and there develops in chloroform a color which interferes with borderline observations. Only preliminary tests were made

Emetine—The reaction occurs slowly, and the solution becomes yellow. Chloroform soluble emetine may be estimated by substituting ether for chloroform, but the reflection of the yellow color on the ether makes borderline observations uncertain

Morphine Sulphate—The reaction is practically complete in thirty minutes. The resulting solution develops a color resembling that of bromine, hence the simple decolorization method cannot be used but this color does not pass into the chloroform, and the chloroform modification affords a satisfactory test. The error is less than 1 per cent for solutions up to 1-3000, and about 5 per cent for concentrations of about 1-200,000. The apomorphine test is applicable to very dilute solutions, and concentrations of about 1-420,000 were estimated with errors of about 5 per cent

Procaine and Tulocaine—The reactions are very rapid. Solutions of 1-2000 may be estimated with an error of less than 1 per cent, in concentrations of 1-300 000 the error is about 5 per cent

Quinine and Quinidine—These may be estimated by adding to the point of decolorization probably better than by the chloroform and apomorphine modifications, but one of us (R. L. H.) could not estimate them with errors of less than 10 per cent, owing to the development of a yellowish color, which, however, was invisible to the other (R. A. H.)

Strychnine Sulphate—The reaction requires about ten minutes. Satisfactory estimations were made with dilutions up to 1-100 000. A few tests of solutions of about 1-150,000 gave errors of about 10 per cent

Theobromine—The chloroform and apomorphine modifications afford satisfactory results. The reaction is complete in about thirty minutes. The method of simple decolorization affords at least a rough test. Dilutions up to 1-350,000 were estimated with errors of about 5 per cent

Picrotoxin—An aqueous solution of picrotoxin, 1-1000, may be estimated with an error of about 1 per cent and solutions of much lower concentration may be estimated with a slightly greater error. This is the only simple quantitative chemical test for picrotoxin with which we are acquainted

Salicin—The reaction requires about thirty minutes, the chloroform method is satisfactory. Apomorphine was not tried

Salicylic Acid—The complete reaction requires about 30 minutes but it is nearly complete within 3 minutes. The chloroform modification permits of an accurate test within 5 or 10 minutes after the addition of HCl, the general method (decolorization) is less satisfactory, but it may be used with a control. Salicylic acid decolorizes N/10 bromine solution almost as actively as antipyrine, and with the apomorphine modification it was estimated in a concentration of about 1-900 000. Salicylic acid in concentrated solution forms with bromine a precipitate, which is soluble in chloroform, it does not interfere with the test

Protocol showing the volume of solution of procaine HCl N/200 (1.364 mg. per cc.) which absorbs the bromine in 1 cc. of N/100 bromine solution

Preliminary Test—In each of two tests the gradual addition of 0.53 cc. M/200 Procaine HCl-solution to 1 cc. of N/100 bromine and 0.3 cc. 12 per cent HCl caused complete decoloration

Final Test—To each of 16 test tubes there was added 1 cc. of bromine solution N/100 and 0.3 cc. of 12 per cent HCl. Successively increasing amounts of Procaine solution M/200 were added. Observations were made immediately after 1 minute, after 10 minutes, at the end of which time chloroform was added, and 5 minutes later a trace of apomorphine was added. The intensity of color in the aqueous layer, in the chloroform, and that induced by apomorphine affords a clue to the amount of unabsorbed bromine. The degree of color is expressed as 'xx' (deep color), 'x', 'x' (barely perceptible color), '—' (no color perceptible)

Procaine	Immed	1 Min	10 Min	Chlor 10 Min	Apomorph 15 Min
0 3 cc	xxx	xxx	xxx	xxx	xxx
0 35	xxx	xxx	xxx	xxx	xxx
0 4	xxx	xxx	xxx	xxx	xxx
0 42	xxx	xxx	xxx	xxx	xxx
0 44	xxx	xxx	xxx	xxx	xxx
0 46	—	xx	xx	xx	xxx
0 47	—	x	x	x	xx
0 48	—	x	x	x	xx
0 48	—	—	—	x	xx
0 49	—	—	—	x	xx
0 5	—	—	—	?	x
0 5	—	—	—	?	x
0 51	—	—	—	—	—?
0 52	—	—	—	—	—
0 52	—	—	—	—	—
0 54	—	—	—	—	—

The results indicate that 1 cc of *N*/100 bromine solution is decolorized by 0 5 cc Procaine HCl *M*/200, as shown by the chloroform test and by 0 505 cc shown by the apomorphine test Hence 0 682 mg Procaine HCl absorbs 0 7992 mg bromine

SUMMARY

1 Tenth normal bromine solution (Koppeschaar's solution) was used for the quantitative estimation of a number of alkaloids Two general modifications of the method are described

2 By this means quantitative estimations of a number of alkaloids may be made with an error of about 0 5 per cent in concentrations of about 1-1000

3 The error in the quantitative estimation of substances in solutions of unknown concentration increases with the dilution, but antipyrine, amidopyrine and salicylic acid in concentrations of 1-1,000,000 may be determined with errors of from 5 to 10 per cent

4 The estimations are made with controls in which attention must be paid to concentration, temperature, rate of reaction and other factors discussed in the paper

REFERENCES

- (1) Hart, W B, *Soc Chem Ind J*, 13, 60 72 (1921)
- (2) Weiss, S, and Hatcher, R A "Proc Soc Exptl Biol and Med " 23 33 (1925)
- (3) Haag, H B *Jour A Ph A*, 22, 21 (1933)

THE AIR-LIFT EXTRACTOR APPLIED TO THE ANALYSIS OF ALKALOIDAL DRUG EXTRACTS

BY L D SEIF AND T H RIDER

The extraction of alkaloids from pharmaceutical preparations has always been time-consuming and many attempts have been made to accomplish the extraction by means of automatic devices Most of these have been regarded as unsuitable because they depend upon refluxing of the solvent by heat (1) with a resultant possible decomposition of the alkaloid and because of the difficulty of determining when the extraction is complete (2) The air-lift extractor (3) ac-

compleishes the extraction at room temperature, thereby eliminating any error due to heating and it is provided with a stop-cock by means of which samples may be drawn off and tested for completeness of extraction

In the original articles this extractor was used for the extraction of organic acid and its collection and measurement in standard alkali solution In the present series of experiments the reverse of this operation is performed, an organic base is extracted and deposited in an acid solution By this procedure two series of hand shake-outs are eliminated and it is then only necessary to remove the acid solution from the apparatus, make it alkaline with ammonia, proceed with the final extraction in a separatory funnel and titrate or weigh the alkaloid in the usual manner Ammonia is used in the apparatus in place of caustic alkali because chloroform is not decomposed as readily by ammonia (4) and because in making the solution alkaline with ammonia the analysis more closely parallels the official methods for alkaloidal assays (5) A correction factor is not necessary since the acid solution itself is not titrated but must undergo another extraction before the alkaloid is titrated

Method—The large tube of the apparatus (3) is filled nearly to the overflow with chloroform, the preparation to be extracted is superimposed upon it and made alkaline with ammonia A small quantity of chloroform is placed in the smaller tube, 40 cc of 5% sulphuric acid is added and then chloroform until the top of the acid layer is almost to the inlet The air (or nitrogen) is allowed to enter and extraction continued until all of the alkaloid is deposited in the acid layer This point may be determined by removing a small quantity of chloroform solution through the stop-cock at the bottom of the tube and testing it in the usual manner with Mayer's Reagent About four hours are required for the complete extraction of the alkaloid The acid is then removed from the tube the tube rinsed with water and the final extraction made with chloroform in a separator after making the acid solution alkaline with ammonia

A series of extractions made by the air-lift extractor and checked by the hand shake-out method of the U S P X shows the two methods to agree within the limits of experimental error (cf table) The air-lift extractor method requires about one-half the actual working time of the other method although the total elapsed time is somewhat longer

EXTRACTION OF ALKALOID FROM DRUG EXTRACTS BY THE AIR-LIFT EXTRACTOR AND U S P X METHODS

Sample	Air Lift	U S P X
Powd Ext Nux Vomica	12.77% alkaloids	12.83% alkaloids
Fluidextract Nux Vomica	(a) 2.55 Gm alkaloids (b) 2.17 Gm per 100 cc	(a) 2.52 Gm alkaloids (b) 2.20 Gm per 100 cc
Fluidextract Belladonna	0.363 Gm per 100 cc	0.390 Gm per 100 cc
Tincture Hyoscyamus	0.00765 Gm per 100 cc	0.00788 Gm per 100 cc

BIBLIOGRAPHY

- (1) Paget, *J Soc Chem Ind*, 51, 190 (1932)
- (2) Palkin, Murray and Walkins, *Ind Eng Chem*, 17, 612 (1925)
- (3) 'Proc Am Drug Manuf Assoc' 160 (1932)
- (4) Chapman and Hammett, *Ind Eng Chem, Anal Ed*, 5, 346 (1933)
- (5) Desgrez, *Compt rend*, 125, 780 (1897)
- (5) U S Pharmacopœia X, page 452

THE STABILITY OF DIOTHANE SOLUTION II *

BY E S COOK, K BAMBACH AND T H RIDER

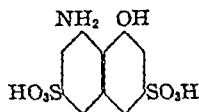
In a previous paper (1) it was reported that prolonged aging or heating of diothane solutions produces a very slight degree of decomposition, yielding a substance containing a primary amino group which may be detected by diazotization and coupling with beta-naphthol. It was pointed out that such a substance could be either an aminobenzoate, formed by rearrangement, or aniline, formed by hydrolysis. A final decision as to the nature of the alteration product was not reached, but it was inferentially shown that its concentration probably did not exceed 1 100,000.

A detailed study of the hydrolysis of diothane by extreme conditions has shown that aniline is, in fact, produced when the hydrolysis is carried out with alcoholic potash. It has been possible to develop a method whereby aniline can be quantitatively recovered. While the details of this experimental work will be published elsewhere, the conclusions are reported in support of the belief that the primary amino compound detected is in all probability aniline.

When diothane solutions are diazotized and coupled with beta-naphthol, as previously reported, the color produced is concentrated upon the precipitate of diothane free base which forms as a result of the alkalinization of the solution. This renders small amounts of color readily detectable but does not make quantitative color comparison easy. The reaction when modified by conducting it in alcohol, in which the free base is soluble, gave a homogeneous color which, however, was not sufficiently intense for colorimetric comparison in the low aniline concentrations encountered.

The standard colorimetric procedure for small amounts of aniline (development of a yellow color with bleaching powder solution) (2) proved to be inapplicable in the presence of diothane. When this reaction was potentiated with phenol (3), the typical blue color appeared but not in sufficient strength for purposes of quantitative comparison.

A diazotization method has been developed using H-acid



instead of beta-naphthol according to the suggestion of Minaev, Svetlyakov and Frolov (4). This reaction was carried out in the presence of alcohol and proved to be of the utmost sensitivity. Concentrations of aniline as low as 1 10,000,000 can be detected qualitatively, which considerably exceeds the 1 500,000 limit claimed by the Russian investigators.

In applying this reaction ten cc of 1% diothane solution are placed in a test-tube, 0.1 cc of 0.5N HCl is added, the solution is cooled in an ice-bath and 0.1 cc of a 10% aqueous solution of sodium nitrite is added. The solution is kept cold for 10 minutes and then made alkaline with 0.5 cc of a 5% aqueous solution of sodium bicarbonate. The precipitate of diothane base is dissolved by the addition of 8 cc of alcohol and then 0.2 cc of a fresh 3% solution of H-acid is added. The H-acid solution is made by dissolving 0.75 Gm of sodium bicarbonate in 50 cc water and

* From the Research Laboratories of The Wm S Merrell Company Cincinnati, Ohio

adding 1.5 Gm of H acid. Five minutes after the addition of the H acid solution to the diothane base solution the color is compared with that of a standard aniline solution which has been coupled with H-acid in exactly the same way and at practically the same time.

The standard aniline solution is made by the addition of a known amount of redistilled aniline to a fresh 1% diothane solution. This diothane solution itself should give no color when coupled with H-acid in the manner described above, indicating that it contains no aniline, or at least that the concentration of aniline present is less than the limiting sensitivity of the test.

Lovibond tintometer readings have been taken of all test colors wherever possible, and it was noticed that the color of a given solution deepened upon standing over night. This deepening in color was not detectable for two hours after the test was completed but sixteen hours or more later was noticeable. The H acid solution itself darkens with time, and this fact is at least a partial explanation of the darkening of the test colors with age.

RESULTS

The above procedure has been applied to several 1% diothane solutions which had been aged for varying periods and to others which had been sterilized at 100° C, both with and without the addition of acid, for varying periods of time. The results are summarized in the following tables.

TABLE I—AGING OF DIOTHANE SOLUTIONS

A ₄₃₆ (Months)	Estimated Aniline Content
Fresh	Neg (<1 10,000 000)
7	1 350,000
9	1 200 000
19	1 80 000

TABLE II—STERILIZATION OF DIOTHANE SOLUTIONS (NO ACID ADDED)

Length of Sterilization (Hours)	Estimated Aniline Content.
1	1 150,000
4 1/2	1 40,000
18 1/2	1 20 000

TABLE III—STERILIZATION OF DIOTHANE SOLUTIONS (ACID ADDED)

Length of Sterilization (Hours)	Estimated Aniline Content
1	1 200 000
4 1/2	1 60,000
18 1/2	1 30 000

The solution, the testing of which is reported in Table II, was unacidified and had a p_H of about 5.0. The solutions, the testing of which is reported in Tables I and III, were manufacturer's stock solutions, the p_H of which had been adjusted to 4.5–4.7, during manufacture. It is evident that the addition of excess acid inhibits the development of aniline on sterilization.

The samples which were sterilized for 18 1/2 hours became slightly yellow and the free base, when precipitated, was yellow. There is, of course, no need for such lengthy sterilization in practice, and such discolored solutions would automatically be discarded by the careful user.

It is of interest to estimate the percentage decomposition of the diothane solution which is necessary to produce the amount of aniline actually detected. Assuming that 1 molecule of aniline is developed by the decomposition of 1 molecule of diothane (complete hydrolysis would yield twice this ratio), complete decomposition of a 1% solution of diothane would lead to an aniline concentration of 1

part in 464 This would mean that a concentration of aniline of 1 80,000 as found would represent a decomposition of only 0 6% of the diothane present Expressed in another way, this would mean that a 1% solution of diothane which had been aged for over 1½ years would still contain at least 0 99% of diothane The sample sterilized for 18½ hours still contained over 0 98% of diothane

This estimation of the maximum amount of diothane which would be decomposed is in harmony with the previously published fact (5) that diothane solutions when sterilized for prolonged periods do not show a perceptible loss in anesthetic activity We have found that, so long as the diothane solution remains clear and colorless, neither aging nor sterilization affects the local anesthetic potency

The aging of diothane solutions is being further studied with a view to correlating aniline formation with p_H changes in order more fully to elucidate the nature of the alterations taking place

SUMMARY

1 Aging or prolonged heating of diothane solutions produces a very small amount of aniline The maximum concentration produced by sterilization (18½ hours at 100°) is 1 20,000 in an unacidified solution, in the acidified solution as furnished by the manufacturers the maximum is 1 30,000 Ordinary solutions show a concentration of about 1 350,000 This change is too slight to affect the local anesthetic potency

2 Addition of acid inhibits the formation of aniline in diothane solution

3 So long as a diothane solution is clear and colorless its local anesthetic potency is unchanged by aging or sterilization Solutions which have for *any* reason become cloudy or discolored should not, of course, be used

4 A very delicate colorimetric method for the estimation of small amounts of aniline has been employed It is capable of detecting aniline in concentrations of 1 10,000,000

REFERENCES

- (1) Rider, T H, 'The Stability of Diothane Solutions,' *J Lab Clin Med* 19, 771 (1934)
- (2) Yoe J H, "Photometric Chemical Analysis" New York 1928, John Wiley and Sons, Inc Vol 1 page 410
Elvove E A Method for the Colorimetric Estimation of Small Amounts of Aniline," *J Ind & Eng Chem*, 9, 953 (1917)
- (3) Christiansen, W G O, 'Determination of Aniline in Dilute Aqueous Solution,' *Ibid* 11 763 (1919)
- (4) Minaev, V I, Svetlyakov, K O, and Frolov, S S, "Colorimetric Determination of Small Quantities of Aniline," *J Chem Ind (Moscow)*, 4, 840 (1927), *Chem Abs*, 22 3602 (1928)
- (5) Rider, T H, 'Piperidinopropanediol Di phenylurethane Hydrochloride, a New Local Anesthetic," *J Pharmacol*, 47, 255 (1933)

HONORING CRAWFORD W LONG

The centennial of graduation from University of Georgia by Crawford W Long, physician-pharmacist, was celebrated in Athens, March 30th Many references to him may be found in the JOURNAL, among them 13 51 (1924), 15, 317 (1926), 17, 517 (1928)

U S P STANDARD FOR DIGITALIS *

BY F A UPSHER SMITH ¹

The Committee of Revision of the United States Pharmacopœia has under consideration the standard to be adopted for digitalis in the U S P XI, and the best means of ascertaining its strength. The U S P X standard is a minimum systolic dose, by the one-hour method, not exceeding 0.006 cc of tincture, equivalent to 0.0000005 Gm of ouabain, for each Gm of body weight of frog. In Europe there is a strong movement in favor of the adoption of the International Standard Digitalis Powder as the standard for digitalis.

At the Frankfurt Conference it was recommended. That when the dosage of digitalis or its preparations is expressed in units of activity, the unit employed for any preparation and in any country should be an international unit, which should be defined as the specific activity contained in 0.1 Gm of the international standard powder."

The International Standard Digitalis Powder has been adopted in the German Pharmacopœia, the French Codex and the British Pharmacopœia (1932). The standard as given for Digitalis Pulverata in the B. P. (1932) is as follows:

"This powder must be assayed by the biological assay of powdered digitalis and its strength must be stated in terms of the international standard digitalis powder of which 0.1 Gm. is taken to have an amount of activity described as 1 Unit."

The B. P. gives alternative directions for the assay of digitalis and its preparations, using a frog method or a cat or guinea-pig method.

The International Standard Powder consists of a carefully dried mixture of ten samples of digitalis leaves collected from different sources. The Sub Committee on Digitalis of the B. P. (*Pharm. J.*, 127, 23 (July 11, 1931)) stated that "it was intended, when the mixture was made, that the potency of the mixture should represent the average potency of digitalis leaves, and records published by the Pharmaceutical Society of Great Britain show this to be the case." (See *Quart. J. Pharm.*, 1, 19 (1928).)

Following the International Protocol, all official tinctures of potent drugs are of 10% strength. If a 10% tincture of digitalis is made from a digitalis of International standard then it will be stronger than one made from U S P digitalis. A comparison was made by Edmunds, Lovell and Braden (*Jour. A. Ph. A.*, 18, 778 (1929)). They concluded that the International Standard Powder was about 30 per cent stronger than the U S P X standard, frogs being used for the assay.

L. W. Rowe (*Jour. A. Ph. A.*, 22, 106 (1934)) finds, by the frog method, that the International Standard tincture is from 20 to 25 per cent more active than the U S P X tincture of digitalis.

J. H. Burn, then head of the Pharmacological Laboratory, Pharmaceutical Society of Great Britain (in the *Quart. J. Pharm.*, 1, 19 (1928)), commented as follows on this question:

"Further, the substitution of the international standard for the present ouabain standard will make no appreciable difference in the United States. In the Pharmaceutical Society's laboratory the lethal dose of tincture prepared from the international standard by the cat method

* Scientific Section, A. Ph. A., Washington meeting, 1935.

¹ From the Department of Therapeutic Trials of the Upsher Smith Company.

was found to be 0.76 cc per Kg, and that of the official U S P ouabain to be 0.06115 mg per Kg. Hence 1 cc of the tincture from the international powder was equivalent to 0.0804 mg ouabain. But the present U S P requirement is that 1 cc of a tincture shall be equivalent to 0.083 mg ouabain, so that the international tincture is for practical purposes the same as a tincture fulfilling the U S P definition."

Dr. Burn suggests that the U S P X tincture of digitalis is for practical purposes of the same strength as a tincture made from the International Standard Powder. It seems to me that his conclusion is based on the supposition that the lethal dose of ouabain is the same for the cat as for the frog.

It is apparent, therefore, that U S P digitalis is weaker in strength than the International Standard Digitalis Powder, and consequently, weaker than digitalis official in the British and German Pharmacopœias and the French Codex.

There seems to be no good reason for maintaining the present standard for U S P digitalis, which may be considered as about four-fifths the International Standard. On the contrary, the continuance of the present standard is open to serious objection. It offers a market in the United States for grades of digitalis that do not meet the requirements of leading European markets. In the case of a delicate vegetable drug, like digitalis, depending for its action on glycosides that are sensitive to heat, moisture and air, it is desirable that the collection, desiccation and storage of the drug should be done under such conditions that the glycosides shall be changed in composition as little as possible. If the temperature is too low the drying process is prolonged and the enzymes have a greater opportunity of decomposing the glycosides. A digitalis of low glycosidal content may therefore be contaminated with an undue proportion of decomposition products and these may be obnoxious in their action when taken internally.

Digitalis is one drug in the production of which too great care cannot be taken. The better grades of commercial digitalis are obtainable in which decomposition has been held to a minimum and the biological strength is above that of the U S P X.

In the world of finance it is generally accepted as a fact that "bad money drives out good money." If the standard for digitalis in the United States be continued below that of leading European countries it will result in attracting the lower grades of digitalis to this country.

Standards must, of course, be attainable. In recommending the adoption of the International Standard for digitalis in U S P XI, I am confident that the standard will easily be met. As a grower of digitalis I have frequently produced a dried leaf of twice the activity of the U S P standard. To adopt the International Standard means raising the present standard only about 25 to 30 per cent. One important result of taking this step would be that the tincture of digitalis of U S P XI would be equal in strength to that official in many leading European countries.

A plea for uniformity in the strength of digitalis preparations was made recently in the *J Am Med Assoc*, 102, 862 (Mar. 17, 1934), in a letter signed by a number of leading cardiologists. If such a plea is valid within a country it is equally so in an international sense, in the interest of travelers. By raising the official standard about 25 to 30 per cent the need for stronger tinctures of digitalis will disappear and a big step will be made toward achieving the desired end—uniformity in strength of the preparations of digitalis. Once this change in strength

was made there would be no further changes to make in the standard for this important drug

The value of a standard powder in bringing together the results of different workers has been described by this writer (*JOUR A PH A*, 20, 471 (1931)) Figures are there given showing how reference to the International Standard brought the results of tests on five samples of digitalis leaf made in three different laboratories to a closer agreement

THE CHOICE OF A BIOLOGICAL TEST

The biological testing of digitalis has raised questions which bristle with difficulties, and about which there is no unanimity The Revision Committee, according to Dr Edmunds (*J A M A*, 102, 1246-1247 (April 14, 1934)) favors a frog method It is not my intention to go into details in discussing the relative values of the frog and the cat method I do want, however, to call attention to the well known fact that a tincture of digitalis tested on frogs at intervals of three months or more will show a startling loss in strength, whereas the same tincture tested at similar intervals on cats, will only show a slight loss in strength This was demonstrated by Wokes (*Quart J Pharm & Pharmacology*, 2, 48 (1929), and 3, 205 (1930)) He found that tinctures from thirteen different samples of digitalis leaves, assayed by the frog method, showed a steady loss of activity in all cases During the first nine months the deterioration proceeded at an average rate of about 3% per month After that time the rate of deterioration gradually decreased, until about one-third of the activity had disappeared at the end of 16 or 17 months Assays by the cat method failed to detect any deterioration

Wokes cites the case of two tinctures A1 and A2, which were assayed when made, and found, in comparison with the International Standard leaves, to be 144 and 148 per cent by the cat method, and 189 and 206 per cent, respectively, by the frog method They were assayed by the frog method again over a year later and both had lost 46% of their original activity, A1 being now 102 per cent and A2 112 per cent

By the cat method these tinctures now had a potency of 142 and 148 per cent, respectively, having lost no activity Had they been diluted to the standard, when made, they would now be 46 per cent below standard, by the frog method, but satisfactory in potency by the cat method If, however, they had been stored undiluted, the cat method would show them much too potent, but the frog method would show them both to be of correct potency This illustrates a pitfall in assaying old digitalis tinctures

Foster and van Dyke (*JOUR A PH A*, 22, 381 (1933)) studied the effect of aging upon the potency of digitalis tinctures, assays being made on the cat and frog Aged tinctures were found to be less potent by assay in both species, however, the greater reduction in potency was usually observed in the frog The frog method makes it exceedingly difficult, if not impossible, for a manufacturer to guarantee the strength of tincture of digitalis, even for 3 months If the frog method be used at the time of manufacture, and the tincture adjusted to the U S P X standard, a check up 3 months later will show a greatly diminished strength This renders the manufacturer vulnerable to attack by the Pure Food and Drugs authorities, who are obliged to take the U S P for their guide

Dr Edmunds stated (in the letter referred to) that no manufacturer had advocated the cat method. By this I presume Dr Edmunds means "no manufacturer on the Committee of Revision." Outside of that body there are manufacturers who have used the cat method, and are still using it, in the belief that they are on safer ground. The cat method has the further advantage that it affords a means of calculating the physiological dose for a patient, by dividing the patient's body weight by 10 and giving that number of cat units in divided doses.

The adoption of the International Standard for digitalis in U S P XI, and the recognition of 100 mg of this powder as an International Unit, using cats for determining the strength, would provide the physicians with products whose dose would be easily calculated by the method of Eggleston. Instead of taking one-tenth the body weight in pounds, as in using cat units, the physician would take *one-twelfth* the patient's body weight in pounds and give that number of International Units, in divided doses.

We have had practical experience of the use of a standard powder for over three years, and are well satisfied that by adopting it we were able to maintain uniformity of strength with greater certainty than without a standard powder.

A national Standard Digitalis Powder for the United States would preferably be prepared from a mixture of powdered leaves from different sources. It would not be necessary to adjust the strength of such a U S P standard powder so as to make it equivalent, weight for weight, to the International Standard, but the ratio between the potencies of the two standard powders could be determined in a series of tests, one series with frogs, and another with cats.

The adoption by the U S P of the International Unit as a standard for digitalis products would be a simple matter. The unit of digitalis would be defined as the amount of activity contained in 0.1 Gm of the International Standard Digitalis Powder, so that 1 Gm of the International Standard represents 10 units.

The British Standard Digitalis Powder tested by different workers showed an average potency, with frogs of 138% of the International Standard or 13.8 units per Gm, so that 1 unit is contained in 0.0725 Gm of the British Standard Powder. When the comparison was made by means of cats the activity was found to be 116% of the International Standard, or 11.6 units per Gm, so that 1 unit is contained in 0.0862 Gm of the British Standard Powder.

Whether a cat or frog method (or both) is adopted in the U S P XI there will, therefore, be no difficulty in arriving at a satisfactory standard digitalis powder for use in the United States.

Paraphrasing the well-known axiom of homeopathy, there seems to be a unanimity of opinion among pharmacologists that, in the selection of standards, "*similia similibus æstimantur*" is a safe guide.

TWELFTH INTERNATIONAL CONGRESS OF PHARMACY

The Twelfth International Congress of Pharmacy, as heretofore mentioned, will convene in Brussels, July 30th to August 6th, under the patronage of His Majesty Leopold III, organized under the auspices of the International Pharmaceutical Federation, the National Pharmacy of Belgium, the Pharmaceutical Society of Anders.

Members attending the Congress will have a free admission to the World's Fair being held at that time and reduction rates on railroads. The opening session will be held in the Hall of Fame of the University of Brussels. The banquet will take place on August 2nd.

STUDIES ON THE BIOASSAY OF DIGITALIS *¹

II NEW LEG-VEIN AND INTRAMUSCULAR GUINEA-PIG METHODS

BY JAMES H. DEFANDORF

Guinea-pig, cat and frog methods for the assay of digitalis are optional in the recent British Pharmacopœia (1). In the United States the one-hour frog method is official (15) and the intravenous cat method (7) is highly recommended by various investigators (6, 8, 13), while the use of the guinea pig for this purpose is rather limited.

The practical value of the guinea pig in toxicological tests seemed to warrant further investigations with this animal in the assay of digitalis. New leg-vein and intramuscular minimum lethal dose methods with simplified technique were devised and checked against the subcutaneous guinea-pig method of Reed and Vanderkleed (10), the U S P X one-hour frog method (15), the modified four-hour U S P X frog method (4), the intravenous frog method of Smith and McClosky (14), and the intramuscular frog method of Dooley and Higley (5). Since some uncertainty seemed to exist as to whether the death of this animal following digitalis intoxication was primarily of cardiac or respiratory origin, this subject also was investigated by observing the relative occurrence of cardiac and respiratory failure.

METHODS

The Subcutaneous Guinea Pig Method (10)—Tincture of digitalis, rendered alcohol free by evaporation and diluted with water, is injected subcutaneously in the abdominal region of guinea pigs weighing about 240 Gm. and the minimum lethal dose determined, which is the smallest amount injected causing death within a period of two hours.

The New Leg Vein Guinea Pig Method—Guinea pigs ranging in weight from 250 to 350 Gm. were used. All alcohol was removed from the tincture by evaporation and the residue diluted with physiological saline to make preparations varying from 3 to 5 per cent in strength, so that the amount of fluid injected ranged from 1 to 2 cc., depending on the dose and size of the animal. The guinea pig was then securely tied abdomen downward to the special animal board and the large superficial vein on the dorsal and inner aspect of the hind leg was exposed according to the procedure of Roth (12). The preparation was then slowly injected at the rate of 1 cc. per minute in order to avoid toxic effects due to concentration of the drug. The symptoms were noted and the time of death recorded, the minimum lethal dose being the smallest amount injected causing death within two hours in over half the animals.

The New Intramuscular Guinea Pig Method—Guinea pigs ranging in weight from 250 to 350 Gm. were used. All alcohol was removed from the tincture by evaporation and replaced with physiological saline, so that the preparation retained its original drug strength. Dilutions were not made in order to avoid the injection of too large an amount of fluid. The dose was injected in equal amounts into the posterior muscles of each thigh. The minimum lethal dose is the smallest amount injected which caused death within two hours, in over half the animals.

The U S P X Frog Method (15)—This is the official method of the United States Pharmacopœia.

The Modified U S P Four-Hour Frog Method (4)—This method differs from the U S P X method only in that four hours instead of one hour are allowed for the absorption and action of the drug.

The Intravenous Frog Method of Smith and McClosky (14)—The minimum systolic standstill dose is determined one hour following the injection of digitalis into the abdominal vein of the decerebrated frog.

* Scientific Section, A. P. H. A., continued from Madison meeting A. P. H. A., 1933.

¹ Department of Pharmacology and Therapeutics, School of Medicine, the George Washington University, Washington, D. C.

The Intramuscular Frog Method of Dooley and Higley (5)—The dose of digitalis is injected in equal amounts into the thigh muscles of the frog. The minimum systolic dose is the smallest amount injected causing systolic standstill in one hour.

EXPERIMENTAL PROCEDURES

Four tinctures of digitalis, designated as "B," "C," "D" and "Dx," were examined. All except "Dx" were defatted tinctures made according to U S P X directions. "B" was made from Gilpin "M" leaves, "C" and "D" from McIlvaine leaves, while "Dx" was made from "D" by dilution, the degree of dilution being unknown to the author until all assays were completed.

In the guinea-pig tests male and female animals weighing from 250 to 350 Gm were used. They were kept in the animal building at room temperature and fed on a well-balanced ration consisting of a brand of prepared food known as Purina Rabbit Chow, and water, this diet occasionally being supplemented with hay and green leafy vegetables.

Food was withheld from the guinea pigs the night before the experiments and the animals were weighed to within one Gm immediately preceding the test. Doses were calculated on the basis of these weights. The alcohol-free preparations were not filtered before injection. Death occurring within two hours as the result of respiratory failure was taken as the end-point. Re-injected guinea pigs were not included in the results, as they invariably lost weight and were in poor condition for many days following the first injection, contrary to the observations of Vanderkleed and Pittenger (16).

The following is a typical protocol of the course of events in the new leg-vein method, the symptoms described being identical with those of the subcutaneous and new intramuscular methods, except for their slightly earlier appearance as the result of this method of administration.

Guinea pig, male, weight 326 Gm

Tincture B " Evaporated 15 cc. to 3 cc., and diluted residue with physiological saline to make a 5 per cent solution (1 cc. = 50 mg.)

11 20-11 22 Injected 1 cc. of above preparation (= 0.2 of a mg. per Gm.) into leg vein at the rate of 1 cc. per minute

11 30 Grinding of teeth, retching attempts (nausea)

11 35 Violent trembling, retching and salivation, slow labored respiration

11 40 Gasping clonic convulsions

11 42 Violent convulsions, animal falls on side, exhausted from respiratory distress

11 45 Animal remains lying on side in comatose condition, respiration very slow and labored

11 48 Respiration stopped

11 50 Heart still beating

11 55 Chest opened and heart observed, auricles contracting efficiently but slowly, ventricles contracting efficiently but very slowly (36 per minute)

12 00 Ventricles stopped, auricles beating slowly

1 00 Auricles still beating

1 30 Auricles stopped

The results shown in Table I are typical, representing numerous similar observations in all three guinea pig methods, and indicate that respiratory failure is the primary cause of death. After respiration has stopped the ventricles continue to beat in an efficient manner at a slowed rate, and may continue to do so for several minutes.

TABLE I—OCCURRENCE OF RESPIRATORY AND CARDIAC FAILURE IN GUINEA PIGS FOLLOWING DIGITALIS INJECTION (TINCTURE 'C')

Animal Number	How Injected	Time to Respiratory Failure Minutes	Ventricle Minutes	Time to Cardiac Failure Auricle	Time between Respiratory and Ventricular Failure Minutes	Time between Respiratory and Auricular Failure	Dose in Mg per Gm
4 P	Subcut	103	106	Not observed	3	Not observed	0.25
5 B		30	102		72		0.3
6 I		96	143		47		0.3
6 J		119	139		20		0.3
6 K		96	113		17		0.3
6 L	Intrav	29	34		5		0.175
6 H	Subcut	101	110		9		0.3
6 M		85	93		8		0.3
6 N		67	77	252 min	10	185 min	0.35
6 P		81	108	251	27	170	0.35
6 R		79	98	249	19	170	0.35

At this time it should be mentioned that out of 281 guinea pigs injected using various doses of three tinctures and three methods of assay 155 animals died within two hours and only 10 of the surviving 126 died within twenty-four hours. It is therefore apparent that the two hours limit is entirely satisfactory from a practical standpoint.

TABLE II—SUMMARY SHOWING RESULTS OF GUINEA PIG AND FROG ASSAYS OF TINCTURES 'B', 'C', 'D' AND 'D\'

Tincture	Guinea Pig Methods			Frog Methods			
	Subcutaneous	New Leg Vein	New Intramuscular	One Hour U S P	Four Hour Modified U S P	Intra muscular (Dooley Higley)	Intra venous (Smith McClosky)
	Minimum Lethal Dose in Mg per Gm	Minimum Lethal Dose in Mg per Gm	Minimum Lethal Dose in Mg per Gm	Minimum Systolic Standstill Dose in Mg per Gm	Minimum Systolic Standstill Dose in Mg per Gm	Minimum Systolic Standstill Dose in Mg per Gm	Minimum Systolic Standstill Dose in Mg per Gm
'B'	0.25	0.175		0.8	0.8	0.8	0.4
'C'	0.3	0.2					
'D'	0.3	0.2	0.225	0.7	0.8	0.8	0.4
'D\''			0.4	0.9			

Table II is a brief summary of the minimum lethal and minimum systolic standstill doses obtained on four tinctures by guinea pig and frog methods, respectively. The number of animals used in the guinea pig assays ranged from 17 to 48 per assay method depending on the number needed to obtain clear cut results, and the number of animals from which the minimum lethal dose itself was determined never was less than 5 and never more than 12.

Tincture 'C' was exhausted before it could be assayed on frogs, so that it affords a comparison only of the subcutaneous and leg vein guinea pig methods.

Since tincture 'D\'' was a preparation of unknown strength made from tincture 'D' by dilution prepared particularly for further investigation of the new intramuscular guinea pig method first used in the assay of tincture 'D,' the guinea pig results were only checked against the official U S P X one hour frog method.

Analysis of this table shows that the minimum lethal dose in the leg vein method is smaller than that in the subcutaneous method, and in the one case where comparison is possible (tincture 'D') the intramuscular minimum lethal dose falls between the leg vein and the subcutaneous minimum lethal doses.

While three of the four methods indicate that tinctures 'B' and 'D' are of identical strength, the two guinea pig methods indicate that tincture 'B' is approximately 15 per cent stronger than 'D'. These results in themselves are insufficient for the purpose of determining which animal gave the better picture of the relative strengths of the two tinctures.

An interesting comparison of the intramuscular guinea-pig and the U S P X frog methods is furnished in the assay of tinctures 'D' and 'D\'' According to the new intramuscular guinea

pig assay tincture "D\ " is 56.3 per cent of the strength of tincture "D," while by the U S P X frog assay "D\ " is 77.7 per cent of the strength of "D " As tincture "D\ " was made by adding two parts of the menstruum to three parts of tincture "D " the former preparation was actually 60 per cent of the strength of tincture "D " It is thus apparent that the intramuscular guinea pig method gave a much more accurate evaluation than did the official U S P X frog method

DISCUSSION

The administration of lethal amounts of digitalis to the guinea pig causes death apparently by its toxic action on the respiration (protocol and Table I) In the case of observations on many other animals, the results of which are not included in Table I, the heart beats could be felt through the chest wall for some time after respiration had stopped

The question arises as to whether the conclusion of Richaud (11) is sound, that is, whether respiratory failure renders valueless the guinea pig as an assay animal for digitalis, a drug mainly used for its effect on the heart One of the principles of bioassay which Dale (3) and Burn (2) emphasize is that a test does not have to be identical with therapeutic effect as long as it measures the important active principle Comparison of the results obtained by four frog and three guinea-pig methods of assay on digitalis, in which artificial respiration was not employed, show a fairly close agreement, the advantage lying slightly on the side of the guinea-pig method It seems logical to conclude from these results that lethal dose guinea-pig methods, in which death is primarily due to respiratory failure, are reliable measures of the activity of digitalis, when compared with frog heart methods

The subcutaneous, new leg-vein and new intramuscular guinea-pig methods possess advantages over the intravenous methods of Knaffl-Lenz (9) and that of the recent British Pharmacopœia in that anesthesia is unnecessary, artificial respiration is not employed, and the operative procedure is less severe, as a result they are less time consuming and larger numbers of animals can be used in a given length of time, with a resultant decrease in experimental error

Preference in the three guinea-pig methods is therefore not dependent on relative bioassay value, as all apparently give satisfactory results, but upon utility as to time and technique The subcutaneous and new intramuscular methods are very simple and can be quickly performed The new leg-vein method is more time consuming The investigations with the new intramuscular method indicate that this method may prove to be of greater practical value in the assay of digitalis than the other methods

SUMMARY AND CONCLUSIONS

Male and female guinea pigs varying in weight from 250 to 350 Gm showed no apparent differences in susceptibility to digitalis

Guinea pigs once injected with digitalis should not be used again in assaying this drug, except in preliminary tests, as these animals lose weight and often remain in poor condition for many days following its administration

Evidence is presented which indicates that respiratory failure is the primary cause of death following the parenteral administration of digitalis to guinea pigs

The subcutaneous, new leg-vein and new intramuscular guinea-pig minimum lethal dose methods compare favorably with the frog heart method for the bioassay of digitalis

BIBLIOGRAPHY

- (1) British Pharmacopœia (1932)
- (2) Burn J H, *Physiol Rev*, 10, 146 (1930)
- (3) Burn, J H, "Methods of Biological Assay," London (1928), introd by H H Dale
- (4) Defendorf, J H, *Jour A Ph A*, 22, 599-608 (1933)
- (5) Dooley, M S, and Higley, C D, *Proc Soc Exptl Biol Med*, 19, 250-252 (1922)
- (6) Eggleston C *Am J Pharm* 83, 99-122 (1913)
- (7) Hatcher, R A and Brody, J G, *Ibid*, 82, 360-372 (1910)
- (8) Heart Comm N Y Tuberc and Health Assoc, *J A M A*, 102 862 (1934)
- (9) Knaffl Lenz E *J Pharmacol*, 29, 407-425 (1926)
- (10) Reed, E D, and Vanderkleed C E, *Am J Pharm*, 80, 110-120 (1908)
- (11) Richaud A, *Arch intern pharmacodynamie*, 24 225-272 (1914)
- (12) Roth G B, *Pub Health Rep Repr*, 647 7 (1921)
- (13) Rowntree L G and Macht, D I, *J A M A*, 66, 870-871 (1916)
- (14) Smith M I and McClosky W T *Pub Health Rep Supp* 52 (1925)
- (15) U S Pharmacopœia X (1926)
- (16) Vanderkleed C E and Pittenger, P S *Jour A Ph A*, 2, 558-571 (1913)

A COMPARATIVE STUDY OF THE ABSORBABILITY OF SIX CALCIUM COMPOUNDS *¹

BY A RICHARD BLISS, JR, AND ROBERT W MORRISON

INTRODUCTION

Two preliminary reports of this investigation have been published (1, 2) This paper reports the findings of the completed study, and covers the relatively wide gaps (0.25 mg) between the quantities of Magnesium Sulphate required to completely neutralize the absorbed Calcium, presented in the previous papers, as well as time intervals above and below the time factor (2 hours) used in the earlier investigations

The first study concerned itself with Dicalcium Phosphate, Calcium Chloride, Lactate, Glycerophosphate, Gluconate and Hexacalcium Inosite Hexaphosphate These six calcium compounds and Calcium Lacto-phospho-gluconate were the agents investigated in the second study The first six calcium combinations were employed in the final investigation

Since a review of the literature related to these investigations has been included in the reports already published, space will be conserved by omitting the review in this final paper

THE METHOD

The technique (6) employed in the final study was the same as that used before, and is based on the antagonism between magnesium and calcium, earlier experiments having shown that animals narcotized by magnesium are awakened by injections of calcium salts and conversely, animals which have absorbed increasing quantities of calcium require greater amounts of magnesium for narcosis Pure bred albino mice were used The calcium preparations were administered by stomach tube, and, after time intervals ranging from 30 minutes to 9 hours, magnesium sulphate was injected subcutaneously Controls were run at the same time

* Scientific Section, A Ph A, Washington meeting, 1935

¹ From The Reelfoot Lake Biological Station, Reelfoot Lake Tennessee

The mice received no water or food for from 12 to 15 hours before the ingestion of the calcium preparations. From 3 to 10 per cent aqueous solutions or suspensions of the calcium compounds were used. The magnesium sulphate was injected in the form of a 10 per cent aqueous solution. The index was the production of a definite degree of narcosis which presents itself with effective doses in from about 12 to 20 minutes after the injection of the magnesium sulphate solution. The required degree of narcosis was the point at which the mice lie on their backs without movement or attempts to turn over.

Extensive preliminary experiments demonstrated that 0.9 mg of magnesium sulphate ($\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$) per Gm of body weight is just adequate for the production of the required state of narcosis in albino mice. If some of the ingested calcium was absorbed, then a greater amount of magnesium sulphate is required to produce narcosis than is the case where no calcium is administered or absorbed. The amounts of each calcium compound administered in mg per Gm of body weight is equivalent to 0.3 mg of calcium per Gm of body weight. The tables following are self-explanatory.

Table I presents a summary of the results obtained in the studies already published.

TABLE I—SUMMARY OF PRELIMINARY STUDIES

Calcium Salt.	Amt $\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$ Required for Partial Narcosis (Mg per Gm)	Amount $\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$ Required for Complete Narcosis (Mg per Gm)
Calcium chloride	1.25 (3 out of 3)	1.50 (3 out of 3)
Calcium lactate	1.00 (1 " " 3) 1.25 (3 " " 3) 1.50 (1 " " 3)	1.50 (2 " " 3) 2.00 (3 " " 3)
Calcium gluconate	1.00 (3 " " 3) 1.25 (3 " " 3) 1.50 (1 " " 3)	1.50 (2 " " 3) 2.00 (3 " " 3)
Dicalcium phosphate	1.00 (3 " " 3) 1.25 (1 " " 3)	1.25 (2 " " 3) 1.50 (3 " " 3)
Calcium glycerophosphate	0.90 (2 " " 3) 1.00 (1 " " 3)	1.00 (2 " " 3) 1.25 (3 " " 3) 1.50 (3 " " 3)
Hexacalcium inositol hexaphosphate	1.00 (5 " " 5) 1.25 (4 " " 7)	1.25 (3 " " 7) 1.50 (6 " " 6)

Since 0.9 mg per Gm of body weight is the minimum amount of magnesium sulphate ($\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$) required to produce the desired state of narcosis in albino mice which have received no water or food for from 12 to 15 hours, by subtracting 0.9 from the magnesium sulphate values given in the tables, the amounts of magnesium sulphate required to counteract the absorbed calcium are obtained, the larger the quantity of magnesium sulphate required for complete narcosis, the greater the amount of absorbed calcium.

Magnesium sulphate was administered in ascending doses of 0.25 mg per Gm in the preliminary studies. In the final investigation the dose was stepped up in 0.05 mg per Gm quantities so as to determine more closely and accurately the critical points. With each series determinations were made at 30 minute, 1-, 2-, 3-, 4-, 5-, 6-, 7-, 8- and 9 hour intervals after the administration of the calcium preparations. Each mouse was used for but one experiment.

One series of tables will suffice to show how the final studies were made and recorded. Tables II through IX give the results obtained with calcium chloride.

TABLE II —CALCIUM CHLORIDE

MgSO₄ injected 30 minutes after calcium ingestion

Animal No	Wt (Gm) of Mouse	Dose of CaCl ₂ (Mg Ca per Gm Body Wt)	Dose MgSO ₄ (Mg per Gm Body Wt)	Minutes to Narcosis
400	22 25	0 3	1 15	Partial 20
401	12 20			22
402	13 64			17
403	19 55		1 20	22
404	24 48			20
405	20 19			Complete 17
406	18 91		1 20	8
407	23 72			21
408	20 51			20

TABLE III —CALCIUM CHLORIDE

MgSO₄ injected 1 hour after calcium ingestion

409	21 00	0 3	1 20	Partial 23
410	12 22			21
411	21 77			20
412	25 55		1 25	25
413	20 20			24
414	25 12			20
415	20 37		1 30	Complete 20
416	20 00			Partial 12
417	12 80			Complete 12
418	18 65		1 35	12
419	19 25			20
420	23 94			22

TABLE IV —CALCIUM CHLORIDE

MgSO₄ injected 2 hours after calcium ingestion

421	15 77	0 3	1 25	Partial 14
422	20 46			17
423	13 34			17
424	24 86		1 30	17
425	20 16			15
426	16 63			Complete 14
427	24 61		1 35	Partial 19
428	19 95			Complete 17
429	15 32			" 10
430	20 00	"	1 40	" 8
431	15 30	"		" 5
432	27 20	"		" 12

TABLE V —CALCIUM CHLORIDE

MgSO₄ injected 3 hours after calcium ingestion

433	20 00	0 3	1 25	Partial, 15
434	17 00	"		" 23
435	20 00	"	"	Complete 11
436	17 00		1 30	Partial 19
437	16 00			20
438	15 00			Complete 9

439	13 56	'	1 35	Partial,	16
440	18 51	'		Complete,	10
441	21 09			"	7
442	20 32		1 40		10
				(Died, 15 min)	
443	20 54	'		Complete,	10
444	20 41	'			8
				(Died 16 min)	

TABLE VI —CALCIUM CHLORIDE

MgSO₄ injected 4 hours after calcium ingestion

445	21 83	0 3	1 30	Partial	19
446	17 91				18
447	22 05				16
448	21 12		1 35		17
449	12 65			'	16
450	24 31				20
451	18 03		1 40	'	20
452	13 85	'		'	16
453	18 20			Complete,	8
454	16 79		1 45		14
455	21 23	'			20
456	22 36		'	'	13

TABLE VII —CALCIUM CHLORIDE

MgSO₄ injected 5 hours after calcium ingestion

457	19 45	0 3	1 35	Partial,	16
458	15 32	'		'	17
459	19 87	'			17
460	27 85		1 40	Complete,	14
461	23 36			Partial,	16
462	17 41				19
463	15 30		1 45		19
464	18 45	'		Complete,	17
465	21 33		"	"	19
466	18 76	"	1 50	'	12
467	20 12	'	'	'	10
				(Died)	
468	14 85		'	Complete	13

TABLE VIII —CALCIUM CHLORIDE

MgSO₄ injected 6 hours after calcium ingestion

469	19 86	0 3	1 35	Partial,	21
470	19 23	"	"	"	14
471	24 76		'	'	18
472	27 54	"	1 40	"	16
473	22 27			Complete,	13
474	22 39				13
475	20 45		1 45	'	17
476	24 32	'	'		18
477	23 66		'	"	20

TABLE IX — CALCIUM CHLORIDE

MgSO₄ injected 7 hours after calcium ingestion

478	17 50	0 3	1 30	Complete, 15
479	20 88	"	"	Partial, 15
480	21 75	"	"	" 13
481	18 45	"	1 35	Complete, 13
482	16 59	"	"	" 13
483	24 67	"	"	" 11

At the end of the 7th and 8th hours further uniform decreases in amounts of Magnesium Sulphate required for narcosis were observed. Table X summarizes the results obtained in the entire investigations through the seventh hour.

TABLE X — SUMMARY OF COMPLETED STUDIES

Magnesium sulphate required for complete narcosis at various intervals

Drug	30 Min	1 Hr	2 Hrs	3 Hrs	4 Hrs	5 Hrs	6 Hrs.	7 Hrs
Calcium chloride	1 25	1 35	1 40	1 40	1 45	1 50	1 45	1 35
Calcium lactate	1 40	1 55	1 55	1 60	1 65	1 65	1 55	1 40
Calcium gluconate	1 30	1 30	1 35	1 45	1 55	1 50	1 45	1 40
Dicalcium phosphate	1 15	1 25	1 35	1 40	1 45	1 40	1 35	1 30
Calcium glycerophosphate	0 95	1 05	1 10	1 15	1 25	1 25	1 20	1 05
Hexacalcium inosite hexa-phosphate	1 20	1 25	1 30	1 35	1 45	1 45	1 40	1 35

DISCUSSION

The results obtained show that there is a fair degree of variation in the absorbability of the six calcium compounds studied. When arranged according to the maximum amount absorbed, they place themselves in the following order:

- 1 Calcium lactate
- 2 Calcium gluconate
- 3 Calcium chloride
- 4 { Hexacalcium inosite hexaphosphate
Dicalcium phosphate
- 5 Calcium glycerophosphate

With each compound there is a constant rise in the calcium absorbed until the fourth hour when a maximum absorption is reached for all of the calcium compounds studied excepting calcium chloride which requires five hours. The larger quantities of calcium are absorbed during the third, fourth, fifth and sixth hours after administration. The fall begins in the sixth hour.

It is interesting to note that the calcium-lactic acid combination heads the list. These observations are in agreement with the findings of McGowan and Berghem. McGowan (3) demonstrated with rabbits that the most important single factor influencing the absorption of calcium and phosphorus seems to be the acidity of the gastric contents. Berghem (4) has pointed out the significant influence the lactic acid radical has on the absorption of calcium, and suggested that the much higher proportion of lactose to calcium and phosphorus in human as compared with cow's milk may be a factor in the higher degree of utilization of the calcium content of the former. He attributes the fact to the production of a distinctly acid condition throughout the gastro-intestinal tract, due to increased lactic

acid formation in the intestine, Rowe and Kahn (5) having shown that the alkaline intestinal and pancreatic secretions and bile exert an inhibitory influence on the rate of calcium absorption

It is obvious that of the six calcium compounds studied, in albino mice, calcium lactate is the most rapidly and effectively absorbed calcium compound for oral administration. It is reasonable to assume that the same may hold in human subjects

The authors are indebted to Miss Jessie May Gill for valuable assistance during these studies in which over 900 albino mice were used

BIBLIOGRAPHY

- (1) Bliss, A. R., Jr., Prather, E. O., Jr., and Morrison, R. W., *Jour. A. Ph. A.*, 23, 656 (1934)
- (2) Bliss, A. R., Jr., and Morrison, R. W., *J. Tenn. Acad. Sci.*, 9, 232 (1934)
- (3) McGowan, J. P., *Biochem. J.*, 27, 934, No. 3 (1933)
- (4) Berghem, O., *J. Biol. Chem.*, 70, 35-51 (1926)
- (5) Rowe, J. H., and Kahn, B. S., *J. A. M. A.*, 88, 981 (1927)
- (6) Kofler, L., and Fischer, R., *Arch. f. exp. Pathol. u. Pharmacol.*, 149, 326 (1930)

DRUGS AND BUGS *

BY ERNST T. STUHR ¹

The elemental forces which destroy and devour natural resources have long been interesting and fascinating to the curious mind. As the visible forces, such as floods, storms, famines and diseases, destroy progress in civilization, so too, are unnoticed destructive forces. Insects have long been known to be the most destructive of animals. Stored vegetable and animal products are subject to constant menace of invasion by parasites unless proper storing facilities and preventive precautions are observed.

The stock-room of the drug store is, in some instances, a disorderly, neglected and mistreated department of the store. If this is the case, a very untidy situation and atmosphere results, creating a haven for pest invasion of all kinds, including rodents (rats and mice), which are often carriers of bacteria and disease germs.

In general, drugs possessing an abundance of starch, inulin and sugars are most liable to the attack of pests. It should be kept in mind, however, that even in products not infested there is a gradual deterioration which in time renders many products unfit for use. Sanitary storage as a preventive measure is of importance in retarding deterioration.

Every retailer and wholesaler should be vitally interested and should profit by acquiring knowledge of the appearance and habits of the enemies which are harmful and detrimental to drugs in general. An acquaintance with the insect kingdom, as to harmful insect pests, their life cycles and habits and some of the possible preventive and combative means or methods, is essential. The ento-

* Scientific Section, A. Ph. A., Washington meeting, 1934

¹ Department of Pharmacology and Pharmacognosy, School of Pharmacy, Oregon State College

mological knowledge of the pharmacist need not necessarily be exhaustive, therefore, a synopsis of the extensive class of insects, more numerous in species than all other animals combined, is sufficient

PHARMACO-ENTOMOLOGICAL DISTINCTION OF INSECTS ¹

Insects in the adult stage possess well-developed mouth parts. A simple classification or two-group division of insects will be considered according to mouth parts

- A Mouth parts fitted for chewing
- B Mouth parts fitted for sucking

The pharmacist should be interested for the most part in the so called "biting insects". The "sucking insects" have little opportunity to destroy materials commonly stocked in the drug store, which consists primarily of dry package materials. Certain of the so-called "sucking insects," however, cannot be ignored. Certain young insects have been provided by nature with jaws for biting, which later develop into sucking insects, e g, certain caterpillars (later become moths or butterflies)

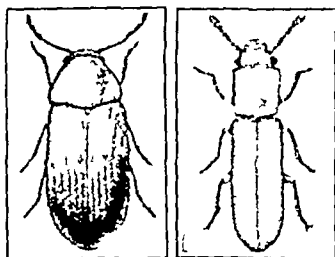


Fig 1

Fig 2

Fig 1—*Sitodrepa panicea* L (Fam Anobiidae) (after Chittenden U S Dept Agr)

Fig 2—*Silvanus gemellatus* Duv (Fam Cucujidae) (after Chittenden, U S Dept Agr)

During the past six years extended observations have been conducted on infested stocks with studies of causes of conditions and various possible means of combat for eradication of pests. Monthly, seasonal and yearly checks have been kept, primarily on the so-called "animal parasites" or insects, with enlightening results.

In this paper some of the pests commonly detrimental to stocks and some simple methods found useful in eradicating them are outlined. A list of the more susceptible drugs which are injured

by common pests should be most worthy of consideration

DESTRUCTIVE BEETLES INFESTING CRUDE DRUG STOCK ²

Fig 1 *The Drug Store Beetle*—A reddish brown insect 2.4 to 2.7 mm in length and covered with a short dense pubescence. It is cosmopolitan, being found in homes, stores, warehouses etc. This beetle infests nearly all sorts of dried plant and animal matter. The eggs are laid on the food, the larvae working in. Pupation is within a cocoon and the life cycle is completed in less than two months. Control is by fumigating or by heating to 49° C. Carbon disulphide is the recommended fumigant for grains.

Fig 2 *The Square Necked Grain Beetle*—A reddish brown insect of about 2.5 to 3 mm in length. This beetle is more abundant in warmer climates but may be found in heated buildings and warehouses. It eats out the germs of the seed in which it develops. The life cycle is completed in about three weeks. Control as recommended by the U S D A for grain beetles is similar to that for the drug store beetle.

¹ Sayre, "Organic Materia Medica and Pharmacognosy"

The author is indebted to members of the staff of the Department of Entomology for the identification of the respective beetles.

CRUDE DRUG STOCK FOUND INFESTED

(a) *Infested by the Drug Store Beetle*

Angelica (rhizome and roots)
 Aralia (rhizome and roots)
 Asclepias (root)
 Aspidium (rhizomes and stipes)
 Bryonia (root)
 Cichorium (root)

Colchicum (corm)
¹Euonymus (root bark)
 Glycyrrhiza (rhizome and roots)
 Kola (cotyledon)
 Lappa (root)
 Stillingia (root)

(b) *Infested by the Square Necked Grain Beetle*

Amygdala Amara (kernel)
 Belladonna (root)
 Berberis (rhizome and roots)
 Calumbā (root)
 Iris (peeled rhizome)

¹Iris versicolor (rhizome)
 Kava (rhizome and roots)
 Rheum (rhizomes and roots)
 Sumbul (rhizome and roots)
 Zingiber (rhizome)

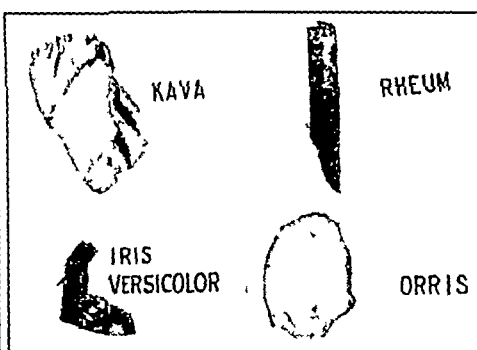
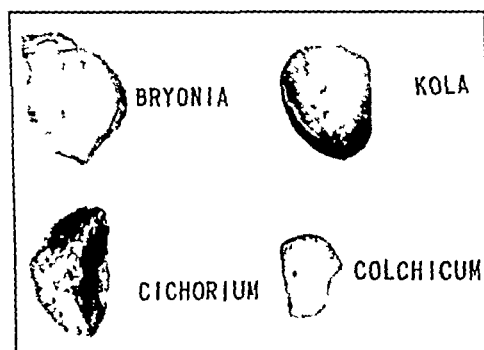


Fig 3—Crude drug stock found infested by drug store beetle

Fig 4—Crude drug stock found infested by square necked grain beetle

MEASURES FOR DETECTION, PRESERVATION AND EXTERMINATION

I Detective Suggestions—a Inspection of stock room, cellars counters packages, shelves containers laboratories and boxes is essential

b Evidences of pest presence indicated by much powder and broken pieces or bits in bottom of stock containers

c Determination of classification of pest—whether beetle, moth, fly mold rust, etc Knowing nature of the pest will assist in determining the proper remedy for effective extermination

II Preventive Suggestions ²—a Observe sanitation and cleanliness (insect parasites indicate filth)

b Store only pest-free products

c Keep vegetable and animal drugs in a dry, cool atmosphere (preferably in air tight containers, rooms or bins)

d Maintain ideal storing temperature—25° C (77° F)

III Combative Suggestions—Effective methods of extermination

a For eggs larvæ and insects ³ Expose to temperature of 60° to 65° C (140° to 149° F) for about fifteen minutes in case of small amounts of products For larger quantities of materials the temperature exposures should be from two to three days Scald and thoroughly dry containers *Caution* High temperature with volatile drugs is reputed detrimental

¹ Infested with both insects

Dunn "Insect Friends and Foes," *Am J Pharm*, 104 (October 1932)

² Youngken, "Textbook of Pharmacognosy"

mological knowledge of the pharmacist need not necessarily be exhaustive, therefore, a synopsis of the extensive class of insects, more numerous in species than all other animals combined, is sufficient

PHARMACOLOGICAL DISTINCTION OF INSECTS¹

Insects in the adult stage possess well-developed mouth parts. A simple classification or two group division of insects will be considered according to mouth parts

- 1 Mouth parts fitted for chewing
- B Mouth parts fitted for sucking

The pharmacist should be interested for the most part in the so called "biting insects". The sucking insects have little opportunity to destroy materials commonly stocked in the drug store, which consists primarily of dry package materials. Certain of the so called "sucking insects," however, cannot be ignored. Certain young insects have been provided by nature with jaws for biting, which later develop into sucking insects, e. g., certain caterpillars (later become moths or butterflies)

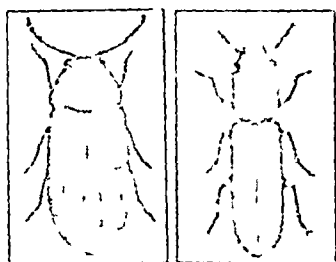


Fig 1

Fig 2

Fig 1 — *Sitona panicea* L (Fam Anobiidae) (after Chittenden U S Dept Agr)

Fig 2 — *Sitona gemellatus* Duv (Fam Cucujidae) (after Chittenden U S Dept Agr)

During the past six years extended observations have been conducted on infested stocks with studies of causes of conditions and various possible means of combat for eradication of pests. Monthly, seasonal and yearly checks have been kept, primarily on the so called "animal parasites" or insects, with enlightening results.

In this paper some of the pests commonly detrimental to stocks and some simple methods found useful in eradicating them are outlined. A list of the more susceptible drugs which are injured

by common pests should be most worthy of consideration

DESTRUCTIVE BEETLES INFESTING CRUDE DRUG STOCK

Fig 1 *The Drug Store Beetle* — A reddish brown insect 2.4 to 2.7 mm in length and covered with a short dense pubescence. It is cosmopolitan being found in homes, stores, warehouses, etc. This beetle infests nearly all sorts of dried plant and animal matter. The eggs are laid on the food, the larva working in. Pupation is within a cocoon, and the life cycle is completed in less than two months. Control is by fumigating or by heating to 19° C. Carbon disulphide is the recommended fumigant for grains.

Fig 2 *The Square Necked Grain Beetle* — A reddish brown insect of about 2.5 to 3 mm in length. This beetle is more abundant in warmer climates but may be found in heated buildings and warehouses. It eats out the germs of the seed in which it develops. The life cycle is completed in about three weeks. Control as recommended by the U S D A for grain beetles is similar to that for the drug store beetle.

¹ Sayre, "Organic Materia Medica and Pharmacognosy."

The author is indebted to members of the staff of the Department of Entomology for the identification of the respective beetles.

CRUDE DRUG STOCK FOUND INFESTED

(a) *Infested by the Drug Store Beetle*

Angelica (rhizome and roots)	Colchicum (corm)
Aralia (rhizome and roots)	¹ Euonymus (root bark)
Asclepias (root)	Glycyrrhiza (rhizome and roots)
Aspidium (rhizomes and stipes)	Kola (cotyledon)
Bryonia (root)	Lappa (root)
Cichorium (root)	Stillingia (root)

(b) *Infested by the Square Necked Grain Beetle*

Amygdala Amara (kernel)	¹ Iris versicolor (rhizome)
Belladonna (root)	Kava (rhizome and roots)
Berberis (rhizome and roots)	Rheum (rhizomes and roots)
Calumba (root)	Sumbul (rhizome and roots)
Iris (peeled rhizome)	Zingiber (rhizome)

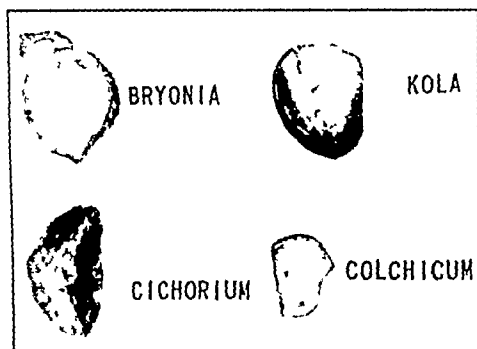


Fig 3—Crude drug stock found infested by drug store beetle

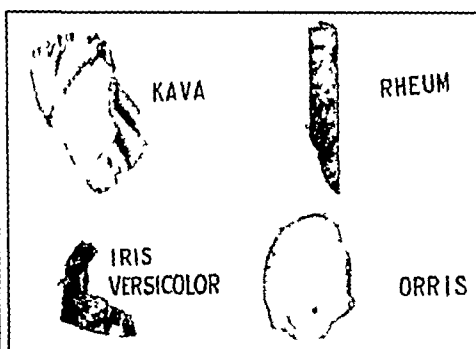


Fig 4—Crude drug stock found infested by square necked grain beetle

MEASURES FOR DETECTION, PRESERVATION AND EXTERMINATION

I Detective Suggestions—a Inspection of stock room cellars, counters, packages shelves containers laboratories and boxes is essential

b Evidences of pest presence indicated by much powder and broken pieces or bits in bottom of stock containers

c Determination of classification of pest—whether beetle moth fly mold, rust etc Knowing nature of the pest will assist in determining the proper remedy for effective extermination

II Preventive Suggestions ²—a Observe sanitation and cleanliness (insect parasites indicate filth)

b Store only pest free products

c Keep vegetable and animal drugs in a dry cool atmosphere (preferably in air tight containers rooms or bins)

d Maintain ideal storing temperature—25° C (77° F)

III Combative Suggestions—Effective methods of extermination

a For eggs, larvæ and insects ³ Expose to temperature of 60° to 65° C (140° to 149° F) for about fifteen minutes in case of small amounts of products For larger quantities of materials the temperature exposures should be from two to three days Scald and thoroughly dry containers *Caution* High temperature with *volatile drugs* is reputed detrimental

¹ Infested with both insects

² Dunn "Insect Friends and Foes," *Am J Pharm*, 104 (October 1932)

³ Youngken, *Textbook of Pharmacognosy*

b For insect infested products¹ Use of fumigants Add several drops of carbon tetrachloride or chloroform (about 25 cc for each 100 cubic feet of drug) Two treatments are advisable, a week or two apart Either of the above insecticides or preservatives are essential and effective against destruction Camphor applications are reputed to be useful in the preservation of dried animal drugs

*IV Requirements of Ideal Pest Exterminators*²—*a* Must arrest growth or destroy parasite

b Must be more toxic to pest than host

c Must be adherent and maintain activating properties for a certain period of time

d Must enter into intimate contact with the parasites or their elements

*V Vegetable or Mold Parasites*³ (*Spore Producing Pests*)—Bacteria, fungi, lichens, molds, rusts, mildews and smuts produce fungus diseases Infest drug stocks exposed to warm, dark, damp atmospheres This group of pests is thought to deteriorate and decompose the active constituents of products Moldy drugs result when stocks are stored in damp atmosphere To prevent destruction keep in dry state

SUGGESTIONS AND PRECAUTIONS TO BE OBSERVED FOR THE PROPER STORING OF THE FOLLOWING CRUDE DRUGS

It is recommended that the drugs tabulated be kept in tightly closed (air-tight) containers, and if found to be infested, occasionally a few drops of chloroform or carbon tetrachloride be added to exterminate or prevent the attack (destruction) of the insects Gratifying results have been obtained for the eradication and prevention of pests in fresh stocks by the so-called "vacuum method" New supplies are placed in a vacuum chamber for several hours and then transferred to air-tight containers for storage

This paper is a preliminary report on an investigation being continued in coöperation with the Department of Entomology and the Oregon State Agricultural Experiment

Station The following drugs are tabulated in the report

Aconite, Aloe, Althea, Bitter and Sweet Almond, Angelica Fruit and Root, Apocynum, Aralia, Arnica, Asclepias, Aspidium, Belladonna Root, Berbers, Bryonia, Calumba Sweet Flag, Cantharides, Capsicum, Caraway, Chicory, Colchicum Corm, Coriander, Cydonium, Dulcamara, Ergot, Euonymus, Fenugreek, Ginseng, Glycyrrhiza, Hydrastis, Inula, Iris, Jalap, Kava, Kola, Lappa, Linseed, Matricaria, Mezereum, Myristica, Parsley Root and Seed, Phytolacca, Pyrethrum, Pilocarpus, Rhubarb, Sabal, Sarsaparilla, Squill, Senega, Senna, Stillingia, Strophanthus, Sumbul, Tamarind, Trillium, Viburnum, Ginger

REFERENCES

- (1) Sayre, Lucius E, "A Manual of Organic Materia Medica and Pharmacognosy," P Blakiston's Son and Co (1917)
- (2) Dunn, Marin S, "Insect Friends and Foes," *Am J Pharm*, 104 (October 1932)

¹ Kraemer's, "Scientific and Applied Pharmacognosy "

² Rusby, Bliss, Ballard, "Properties and Uses of Drugs "

³ Schneider, "Microanalysis of Powdered Vegetable Drugs "

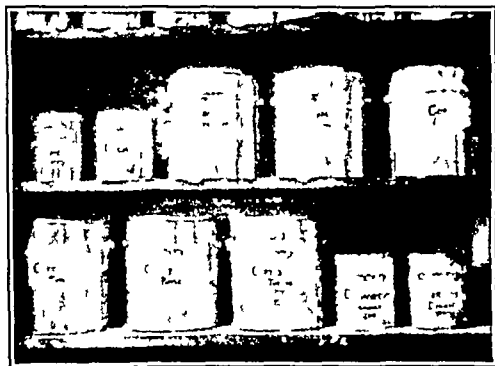


Fig 5—Effective air tight containers

- (3) Youngken, Heber, "Textbook of Pharmacognosy," P. Blakiston's Son and Co (1930)
- (4) Kraemer's, "Scientific and Applied Pharmacognosy," John Wiley and Sons, Inc (1928)
- (5) Rusby, Bliss, Ballard, "Properties and Uses of Drugs," P. Blakiston's Son and Co (1930)
- (6) Schneider, Albert, "Microanalysis of Powdered Vegetable Drugs," P. Blakiston's Son and Co (1921)

THE VOLATILE OIL OF *HYPTIS MUTABILIS* *¹

BY HAROLD W. WERNER²

The plant, *Hyptis mutabilis* (L. C. Rich) Briquet, is widely distributed in Florida. It is not, however, generally recognized by the above name, but by the name *H. spicata* (1).

Material for this investigation was collected near Gainesville, Florida. All the plants were apparently of the same race, however, at the time of collection the material was separated into that having green stems and that having reddish stems. The two batches of plant material produced oils which appeared to be identical.

Peckholt (2) and Schimmel & Co. (3) evidently worked with different races of *H. mutabilis* as their oils differed somewhat from the oils produced by the writer. Epling (1) states that several races of the species can be recognized.

RED STEMMED MATERIAL

Two hundred and four Kg. of green plant yielded by steam distillation 25 Gm., or 0.012% of a dark greenish oil with a faint mint-like odor and an after-taste resembling oil of cassia.

The constants of the oil were: 1 volume soluble in 1 to 3 volumes of alcohol, 1 volume insoluble in 4 volumes of alcohol, d_{25}^{25} 0.8939, n_D^{26} 1.4925, 0% ketones with NaHSO_3 , 9% ketones with Na_2SO_4 , 0% phenols with 4.3% NaOH . $-12\frac{1}{2}^\circ\text{C}$ did not cause the separation of solid matter. A solution of the oil in CCl_4 was levorotatory.

GREEN STEMMED MATERIAL

Two hundred and thirty Kg. of green plant material yielded 46 Gm., or 0.02%, of a dark greenish oil with an odor and taste identical with that of the oil produced from the red-stemmed material.

The constants of the oil were: 1 volume soluble in 1 to 3 volumes of alcohol, 1 volume insoluble in 4 volumes of alcohol, d_{25}^{25} 0.8959, n_D^{26} 1.4924, acid number negligible, saponification value 7.28, saponification value after acetylation 35.21. $-12\frac{1}{2}^\circ\text{C}$ did not cause the separation of solid matter. The optical rotation of 4 cc. of oil with 6 cc. of CCl_4 in a 100 mm. tube was -4.18 .

Fractionation—Twenty Gm. of the oil were fractionated four times under atmospheric pressure. Results are shown in the accompanying table.

DATA FOR FRACTIONS

No	Boiling Temp ° C	d_{25}^{25}	n_D^{23}	Gm
1	160-180	0.8522	1.46874	4.5
2	180-247	0.8800	1.48414	2.5
3	247-263	0.9103	1.49974	6.6
Residue				

* Scientific Section A. P. H. A. Madison meeting 1933.

¹ From the Department of Pharmacognosy and Pharmacology, University of Florida, Gainesville, Florida.

² Professor of Botany and Materia Medica, School of Pharmacy, Duquesne University, Pittsburgh, Pa.

Fraction No 1 was refractionated and 3 cc were obtained which boiled between 162-164° The d_{20}^{20} was 0.8426 and n_D^{23} 1.46244. The constants of this fraction indicate the presence of sabinene. The amount of material precluded further investigation.

Fraction No 3 was treated with 70% alcohol to purify somewhat the hydrocarbons present. The residue amounting to 6 Gm. boiled at 255-259°. The d_{20}^{20} was 0.9088 and n_D^{24} 1.49584. The constants of this fraction indicate caryophyllene. Derivatives could not be obtained because of the small amount of material.

SUMMARY

The above ground portion of *Hyptis mutabilis* yields from 0.012% to 0.02% of a volatile oil, constants of which have been obtained. Oils from the red- and green-stemmed plants are evidently identical. The oil has a high hydrocarbon content and the presence of sabinene and caryophyllene is indicated.

REFERENCES

- (1) Epling, C., Letter to the writer 1931
- (2) Peckholt *Ber deut pharm Ges* 14, 376 (1904) via Finnmere "The Essential Oils," p. 802 (1926)
- (3) Schimmels Report page 96 (April 1904)

PHYTOCHEMICAL NOTES

FROM THE LABORATORY OF EDWARD KREMFERS

NO 113 THE STEROL FROM *PINUS SABINIANA*

BY OLE GISVOLD

The nonsaponifiable material obtained by J. Semb upon saponification of the fatty oil extracted from the seed of the Digger's pine had been turned over to Kurt Bonstedt. By the digitonin method he isolated a sterol which, however, was contaminated by hydrocarbon material as became apparent in the attempt to recrystallize it. Purification of the sterol was effected by allowing it to crystallize from its alcoholic solution. The paraffin which separated with the sterol upon cooling was brought into solution by gently heating the mass for a few moments. As soon as this had been accomplished the sterol crystals were removed by suction filtration. They melted at 137.5° and the acetate melted at 127.5°.

Inasmuch as the mother liquid containing the hydrocarbon also contained some sterol, this was separated by the digitonin method. The digitonide obtained was mixed with sand and the mixture extracted with ether for several hours to remove the hydrocarbons. This accomplished the digitonide was resolved into its components with boiling xylene. The sterol thus obtained revealed the same melting point as that recorded above, the melting point of its acetate also corresponded with that given above.¹

The sterol contained in the fatty oil from the seeds of *Pinus sabiniana*, therefore, appears to be a sitosterol.

Dr. Roy Gardner closed his remarks before the Australian and New Zealand Association for the Advancement of Science (1935) by saying "Pharmacy as a field of work dealing with health has its own responsibility and a share of the general responsibility for watching the growth of science and seeing that the world makes a right use of it for the benefit of mankind."

¹ Windaus, A., *Z. physiol. Chem.* 65, 110 (1910)

THE VALUE OF TOLU COATING, U S P X AND N F V

BY F S BUKEY AND MARJORIE BREW *

The use of tolu as a coating for pills has been recommended for more than seventy-five years. Some of the early investigators even went so far as to employ tolu in forming the mass for phosphorus pills. They made the statement that tolu is soluble in the gastric juice and forms a more plastic pill mass. They also suggested the use of beeswax and tolu as a base for phosphorus pills. Tolu coating is also highly recommended by our present-day textbooks of Pharmacy, as well as being the official coating for Pills of Phosphorus and Pills of Ferrous Iodide.

The authors have found in making enteric coatings that tolu is resistant to the processes of digestion. This leads to the conclusion that possibly tolu coating for these official products is of little value. With this idea in mind, a study was made of tolu-coated pills to determine the percentage of disintegration in the body.

The efficiency of the tolu coating was determined by making some pills, approximately the same size as the official Pills of Phosphorus. The formula for the mass used was as follows:

Methylene Blue	1 Gm
Althea, powder	12 Gm
Acacia, powder	6 Gm
Barium Sulphate	10 Gm

A mass was made by moistening the ingredients with a sufficient quantity of a mixture of 2 parts of glycerin and one part of water. This mass was then divided and made into 200 pills.

The barium sulphate was added to the mass so that the X-ray could be used to definitely locate the position of the pills in the digestive tract. The methylene blue, by its property of coloring the urine, made possible the determination of the disintegration in cases where the X-ray was not used. The dye was also of value in determining the entirety of the coat. The dried pills were coated with tolu according to the formula given in the U S P. The reason for using this coating on Pills of Phosphorus is to form an air-tight seal protecting the phosphorus from the air. If air should come in contact with the mass of either Pills of Phosphorus or Pills of Ferrous Iodide, oxidation would take place in time, which would make the pill of little value. For this reason, it would be necessary to have the tolu coat entire. By placing the pills in water small openings might be detected by the leakage of the methylene blue. This test was made after the application of each coat until no further evidence of blue was noted. Microscopic examinations of the finished pill showed the coating to be on the average of about 0.1 mm in thickness. These determinations of thickness were made because of the fact that it might be claimed that the pills were coated too heavily. The authors are confident that the coating was no thicker than required to protect the pill. Further microscopic examinations of these coats showed that the tiny depressions in the surface of the pill would not coat as heavy as the smoother surfaces, thus making weak spots in the coat. It is the opinion of the authors that if the coat could be applied uni-

* The College of Pharmacy, University of Nebraska, Lincoln, Neb.

formly, these pills would be as impervious to water and the digestive fluids as lead shot

Some of the early investigators made the discovery that old tolu, which had lost most of its volatile oil, was better for a coating than the fresher balsam. The authors agree with this statement as the results of their experiments indicate that there was greater disintegration of pills coated with tolu which was over ten years old. This is believed to be true, because old tolu is more brittle and, therefore, cracks more easily.

In order to be certain that the samples of tolu were not of an inferior grade, the pills were coated with tolu obtained from four different sources: J. L. Hopkins & Co. (4), S. B. Penick & Co. (1), Eimer and Amend (3), Chas. Huisking and Co., Inc. (2).

The coatings were tested in two ways, by the use of the X-ray and by giving an individual one of the pills and then observing the color of the urine for sixty hours. When the X-ray was used, the subject was given six pills. Radiographs were then taken at desired intervals until the pills were excreted from the body or were disintegrated. In most cases, these experiments extended over two days. A small teaspoonful of Bari o meal in a glass of water, was given before the first radiograph was taken in order to locate the stomach. The shadow produced by this amount of Bari o meal was not heavy enough to mask the pills.

The results obtained by giving the subject a single pill, coated with tolu, purchased from (1) were as follows:

Thirty seven subjects were used, 23 subjects were used more than once, 8 of the 23 subjects showed no disintegration. In no case where the subject was used more than once was it found that every pill disintegrated, 109 pills were given, 31 pills disintegrated. The percentage of disintegration was 28.44.

The disintegration time was as follows:

One to 5 hours, 1 pill, 6 to 10 hours, 1, 11 to 15 hours, 7, 16 to 20 hours, 3, 21 to 25 hours, 5, 26 to 30 hours, 6, 31 to 35 hours, 5, 36 to 40 hours, 1, 41 to 45 hours, none, 45 to 50 hours, 2 pills.

The X-ray experiments with (1) tolu gave the following results, with the four subjects that were used:

Subject 1, pills disintegrated, 1, excreted, 4, undetermined, 1. Subject 2, disintegrated, 3, excreted, 3, undetermined, none. Subject 3, disintegrated, 2, excreted, 4, undetermined, none. Subject 4, disintegrated, none, excreted, 5, undetermined, 1.

The following table gives the number of pills with their time and location of disintegration and the time of excretion:

TABLE I

Time in Hours	5	10	15	20	25	30	35	40	45	50
Stomach	18	13 2D ¹	5							
Small intestine	6	2	1							
Ascending colon		1D	1	12	10	3	3			
Transverse colon			1D	2D		4	1	2	2	
Descending colon						2	2	4	4	
Pelvic colon			3	3		2	5			1
Excreted				3	2	1		3		7

¹ The letter D is used to designate disintegration. The number preceding the D is used to designate the number of pills disintegrating and the number in front of the dash is the total number of pills, inclusive of the ones disintegrating in the given location, for example, stomach 5 2D.

The results obtained by giving the subject a single pill coated with tolu purchased from (2) were as follows:

Twenty-seven subjects were used, 10 subjects were used more than once, 5 out of the 10 subjects showed no disintegration. In the case of one subject, who was used more than once, it was found that every pill disintegrated, 49 pills were given, 14 pills disintegrated. The percentage of disintegration was 28.57.

The disintegration time was as follows:

One to 5 hours, 1 pill, 6 to 10 hours, none, 11 to 15 hours, 2, 16 to 20 hours, none, 21 to 25 hours, 4, 26 to 30 hours, 3, 31 to 35 hours, none, 36 to 40 hours, 2, 41 to 45 hours, 2, 46 to 50 hours, none.

In the X-ray experiments using (2) tolu, seven subjects were used and the results were as follows:

Subject 1, pills disintegrated, none, excreted, 2, undetermined, 4. Subject 2, disintegrated, 3, excreted, 1, undetermined, 2. Subject 3, disintegrated, 3, excreted, none, undetermined, 3. Subject 4, disintegrated, 1, excreted, 4, undetermined, one. Subject 5, disintegrated, none, excreted, 6, undetermined, none. Subject 6, disintegrated, 1, excreted, 4, undetermined, 1. Subject 7, disintegrated, 3, excreted, 3, undetermined, none.

The following table gives the number of pills with their time and location of disintegration and the time of excretion:

TABLE II

Time in Hours	5	10	15	20	25	30	35	40	45
Stomach	22	17-3D	6						
Small intestine	19	9-1D	1						
Ascending colon	1	13	14-1D	4	10-1D	5-1D			
Transverse colon		1	4	2	4-3D		2	1D	
Descending colon		2	1		1				
Pelvic colon			1	11	9	9	6		
Excreted					13	2	2	3	

The results obtained by giving the subject a single pill coated with tolu purchased from (3) were as follows:

Twenty-two subjects were used, 16 subjects were used more than once, 3 of the 16 subjects showed no disintegration. In the case of three subjects who were used more than once, it was found that every pill disintegrated, 67 pills were given, 35 pills disintegrated. The percentage of disintegration was 52.23.

The disintegration time was as follows:

One to 5 hours, 1 pill, 6 to 10 hours, 4, 11 to 15 hours, 3, 16 to 20 hours, 5, 21 to 25 hours, 11, 26 to 30 hours, 4, 31 to 35 hours, 1, 36 to 40 hours, 1, 41 to 45 hours, 5, 46 to 50 hours, none.

The results of the X-ray experiments using seven subjects may be tabulated as follows:

Subject 1, pills disintegrated, 4, excreted, 1, undetermined, 1. Subject 2, disintegrated, 2, excreted, 4, undetermined, none. Subject 3, disintegrated, 6, excreted, none, undetermined, none. Subject 4, disintegrated, 2, excreted, 4, undetermined, none. Subject 5, disintegrated, 2, excreted, 4, undetermined, none. Subject 6, disintegrated, 4, excreted, none, undetermined, 2. Subject 7, disintegrated, 3, excreted, 1, undetermined, 2.

The following table gives the number of pills with their time and location of disintegration and the time of excretion:

TABLE III

Time in Hours	5	10	15	20	25	30	35	40	45	50
Stomach	17-1D	8	4							
Small intestine	19-1D	6-4D	7-1D							
Ascending colon	3	11	10-1D	6	9-1D	5				
Transverse colon	2	2	3-1D	3	7-3D	4-1D				
Descending colon	1	1	2-1D	2	4-3D			3-3D		
Pelvic colon			3	1	4					
Excreted			3	4	1	6				

The results obtained by giving the subject a single pill coated with tolu, purchased from (4) were as follows

Twenty six subjects were used, 19 subjects were used more than once 5 subjects out of 19 showed no disintegration, 1 subject out of the 19 showed total disintegration, 61 pills were given, 22 pills disintegrated The percentage of disintegration was 36.65

The disintegration time was as follows

One to 5 hours, none 6 to 10 hours none, 11 to 15 hours, none, 16 to 20 hours, 4 pills, 21 to 25 hours, 7, 26 to 30 hours, 8, 31 to 35 hours, 1 36 to 40 hours, none, 41 to 45 hours 2, 46 to 50 hours, none

The results of the X ray experiments using four subjects may be tabulated as follows

Subject 1 pills disintegrated 3 excreted, 1, undetermined 2 Subject 2 disintegrated 4, excreted, 2, undetermined none Subject 3, disintegrated, 2 excreted 4, undetermined none, Subject 4, disintegrated 2 excreted 4, undetermined, none

The following table gives the number of pills with their time and location of disintegration and the time of excretion

TABLE IV

Time in Hours	5	10	15	20	25	30	35	40	45	50
Stomach	18	6	6							
Small intestine	3		4 2D							
Ascending colon	2		7-1D	11 2D	7 1D	6	1D	2 1D		
Transverse colon			2	5	3	2-1D		1-D		
Descending colon			3		1	2		1		
Pelvic colon			2	1 D	2		2	2	2	
Excreted				4	1			2	2	2

By summarizing all the experiments, the following results were found

Two hundred eighty six pills were given, 112 subjects were used, 102 pills disintegrated The percentage disintegration was 35.66

The average for the disintegration time is shown in the following table, which gives the number of pills disintegrated at five-hour intervals It will be noticed that the highest number of pills disintegrated in 21 to 30 hours, which would indicate that most of them were in the colon before disintegration took place For proper medication, disintegration should take place before the pills reach that part of the alimentary canal

One to 5 hours, 3 pills, 6 to 10 hours, 5, 11 to 15 hours, 12 16 to 20 hours 12, 21 to 25 hours, 27, 26 to 30 hours, 21, 31 to 35 hours, 7, 36 to 40 hours, 4, 41 to 45 hours, 9, 46 to 50 hours, 2

It is evident, from this data, that the further use of tolu as a coating should be discontinued, since in 64.34 per cent of the cases no medication whatever was obtained and in many cases where disintegration was obtained, it probably occurred too late for proper absorption It is therefore recommended to the U S P and N F Revision Committees that gelatin coating be substituted for tolu coating in the forthcoming revisions

The authors wish to express their appreciation to the students of the College of Pharmacy, University of Nebraska, for their cooperation in this study

SHARK LIVER OIL *

BY W S JONES AND W G CHRISTIANSEN ¹

As part of our investigation of fish liver oils as sources of Vitamins A and D we have examined the liver oils from a number of species of shark. The commercial samples have generally proved to be not only very poor in taste and color but, with one exception, inferior to cod liver oil in Vitamin A content. Estimation of Vitamin A was made colorimetrically by the antimony trichloride method, using a biologically assayed cod liver oil for comparison, and these data together with those of free fatty acid and unsaponifiable matter, are listed in

TABLE I —COMMERCIAL OILS

	Species of Shark	% F F A	% Unsaponifiable	Estimated Vitamin A
1	Dusky	0.088	2.71	645
2	Leopard	0.186	11.41	410
3	Nurse	0.059	2.79	905
4	Sawfish	0.079	4.85	168
5	Sun	0.079	5.95	4500-6000

Lack of care in the rendering of these oils may easily account for low vitamin content as well as the highly unsatisfactory odor and taste. We therefore prepared a number of oils from fresh livers, using careful, anaerobic technique in order to obtain oils with their full vitamin content, free from the putrid, very fishy and ammoniacal odor and taste observed in the commercial samples. The rendering process is as follows:

The shark liver is macerated and placed in a steam-jacketed, enameled kettle. A small amount of water is added and the mass, agitated the while, is heated to boiling. The boiling is continued 20 minutes with intermittent stirring. The tissue breaks up readily and, when the steam is shut off and the mass cools, settles out, leaving a layer of oil which is easily removed. The oil is mixed with a filter aid and filtered. As before stated, air is excluded, the oil being protected by an inert gas throughout the process.

The following data were obtained on the oils produced in the manner described above:

TABLE II

Sample No	Species of Shark	Color of Oil	% F F A	% Un saponifiable	Vitamin A		Vitamin D	
					Colorimetrically Estimated	Bio logically Determined	Bio logically Determined	
1	Nurse	Yellow	0.28	1.69	868			
2	Sawfish	Reddish yellow	0.42	3.00	3400	2222	14	
3	Sand	Water-white	0.16	9.6	200			
4	Leopard	Orange	0.16	12.4	3080	2700	<14	
5	Nurse (male)	Yellow	0.28		400			
6	Nurse (female)	Yellow	0.84		400			

In each instance one whole shark liver was rendered. The livers vary in weight from 15 lbs for No. 5 to 55 lbs for No. 2. The yield of oil was, of course, lower than would be obtained

* Section on Practical Pharmacy and Dispensing, A. Ph. A. Washington meeting, 1934.

¹ Research Department of the Chemical and Pharmaceutical Laboratories, E. R. Squibb and Sons, Brooklyn, N. Y.

by a solvent extraction method, but in every case was better than the normal recovery from cod livers. The lowest yields, 48.6 and 51.7% were obtained on the two smallest livers, Nos. 5 and 6, the other Nurse liver, however, weighed 36 lbs and yielded 66% of oil. The largest liver, No. 2, gave a yield of 55.3%, and the highest yield, 70.8%, was obtained on No. 4, which weighed 43 lbs.

When these oils were tested colorimetrically for Vitamin A it was found that those from the Sawfish and Leopard species gave much higher values than any of the others, whereas the commercial samples from those two species had given the lowest values. When assayed biologically the specially prepared Sawfish and Leopard oils gave Vitamin A values of 2222 and 2700 U. S. P. X units, respectively, and the cod liver oil control showed 1566 U. S. P. X units. The two shark liver oils were therefore 50-80% stronger in Vitamin A than cod liver oil.

While two of the shark liver oils proved to be considerably more potent than cod liver oil with respect to Vitamin A, they were only one-tenth as strong in Vitamin D, each having about 14 Steenbock units as against 134 in the cod liver oil.

These carefully prepared oils were all free from any putrid or ammoniacal taste or odor, and had only a slight natural fishy taste. They all deposited stearine on standing at room temperature.

SUMMARY

1 Commercial samples of liver oils from the Dusky, Leopard, Nurse, Sawfish and Sun sharks were tested colorimetrically for Vitamin A.

2 Oils were prepared from the fresh livers of Nurse, Sawfish, Sand and Leopard sharks and were tested colorimetrically for Vitamin A.

3 Oils from the fresh livers of Sawfish and Leopard sharks were assayed biologically for Vitamin A and D.

THE PROBLEMS* OF THE TEACHERS AND STATE BOARD EXAMINERS¹

BY HARRY W. MANTZ²

The Teachers of Practical Pharmacy and Dispensing will no doubt agree that the scope of their subject is gradually changing and becoming more complicated. Many causes might be cited, but two of the outstanding are: First, the limited amount of practical drug store experience possessed by the individual when he enters the Pharmacy School and when he appears before the State Board Examiners to prove that he is qualified to practice the profession of Pharmacy, *second*, the large number of new preparations put on the market and the lack of knowledge, concerning these preparations on the part of the physician, the pharmacist and the teacher of pharmacy.

* Of Practical Pharmacy and Dispensing

¹ Section on Practical Pharmacy and Dispensing, A. Ph. A., Washington meeting, 1935

² Associate Professor of Pharmacy, Director of the Pharmacy Laboratories, Temple Uni-

The State Boards are gradually decreasing the amount of practical experience necessary to meet their requirements. The result being that it is now necessary for the teachers to supply the training in the school which was heretofore obtained in the drug store. Our forefathers learned the profession by applying one of the basic laws of learning—"Learn by Doing," no one will deny that this is the most efficient way of learning. Is it possible then for an instructor to supply this demand in the comparatively short time allotted?

The teacher of practical pharmacy and dispensing does not find it a burden to teach the processes and procedures for the manufacture of the U S P and N F compounds and preparations. The pharmacist, however, is not only confronted with these, but with hundreds of others and combinations of them. This being the case it would seem necessary for the teacher to include instruction on these new preparations in order to accomplish that which is expected of him—to prepare the student to practice the profession of Pharmacy and meet the State Board requirements. The question then arises, if the new preparations are considered, at what point should the instruction end? It was pointed out in a paper presented at a meeting last year that nearly four million combinations are possible—to be obtained from one hundred drugs with four in a prescription. This proves that it is not possible for the teacher to give instruction on all the compounds and possible combinations, but only on the basic principles underlying the art of compounding and dispensing. This can best be accomplished by giving the student work which runs parallel to that carried on in the laboratories of the drug stores.

The examiners are also confronted with difficult problems and a good idea of these can be obtained by reading the proceedings of the joint meetings of members of the State Boards of Pharmacy and delegates of the American Association of Colleges of Pharmacy. Briefly, they are as follows. First, "How many and what type of preparations and prescriptions should be given in order to determine how much the applicant knows?" Second, "How many times should the applicant be allowed to make the preparations or compound the prescription?" Third, "What method should be used for grading the preparations and prescriptions?"

These questions have been discussed and no definite agreement has been reached, although the problems are of utmost importance. The teachers of *Materia Medica* have submitted a definite list of drugs, on which the examinations are to be based and, likewise, if the examiners and teachers of practical pharmacy were to cooperate, plans for uniform examinations could be made. It is realized that a definite list of preparations would hardly be possible, therefore, the suggestion for uniform examinations.

The aim of the examiner should be to find out what the applicant knows and not what he does not know. This is best accomplished by giving a comprehensive examination. Therefore, the more preparations and prescriptions given, the better it would be for both the examiner and the candidate. Four preparations or prescriptions are not sufficient to determine the qualifications of the individual, ten would seem a more satisfactory number. The type of preparations, the number of chances given to the individual to make the preparation, or compound the prescription and the method of grading are inter-related.

Most State Boards allow only one chance to make the preparation, providing this rule is followed. This suggestion is offered—that sixty per cent of the examina-

tion consist of U S P and N F preparations with the directions for manufacturing given It is only fair to give the applicant the same privileges which the pharmacist has in the drug store If the directions are given and he has acquired the proper technique, he should be able to make a preparation the first time with perhaps the exception of emulsions This would give the applicant a chance to make a grade of sixty per cent and the remaining forty per cent should consist of work on prescriptions, without directions given In the writer's opinion, it is not fair to expect an odd prescription to be compounded correctly the first time, and in order to be fit for dispensing, it should be perfect to the degree which is possible The prescriptions given in examinations often consist of odd combinations on which a certain amount of experimentation had to be done to ascertain the best method for compounding This, no doubt, suggested the idea to the examiner that it would make a good State Board question Why expect more from a man with a limited amount of experience than from the one who has had at least ten years? In many cases no basic principles are demonstrated in these combinations

One point which the State Boards overlook, as far as the writer has been able to determine, is the applicant's ability to read original prescriptions It would seem more important to be able to read a physician's handwriting and decipher a prescription, than to identify drugs This could be made a part of the work on dispensing prescriptions in the examination The remainder of the examination should consist of determining whether the candidate is qualified to handle a prescription from the time he receives it until it is ready to be handed to the customer Every one present is acquainted with these proceedings without taking the time to enumerate them If the candidate is not capable of making fifteen per cent on the remainder of this work, which will give him a passing grade, he is not qualified to receive a certificate of registration

PROFIT—THE WAY OUT OF THE DEPRESSION *

FOR THE NATIONAL RECOVERY ADMINISTRATION

BY W BRUCE PHILIP

To protect the consuming public the prices of drugs, medicines, toilet articles and drug sundries, must be at such a price level as to allow adequate pharmaceutical service

A code of Fair Competition, for the retail drug trade, must be a guide, not for a few exception drug stores, but for at least ninety per cent of the 60,000 drug stores in the 48 states This ninety per cent of the total number of drug stores serve at least ninety per cent of the geographical territory of the United States This same ninety per cent of the drug stores serve at least seventy-five per cent of the country's population If the Code of Fair Competition for the Retail Drug Trade will not bring recovery to the ninety per cent of the retail drug trade, the code then ceases to be a Code of Fair Competition for the Retail Drug Trade, and becomes a special code for a favored fraction of the retail drug trade

* Section on Commercial Interests A PH A Washington meeting, 1935

The laws of every state in the Union, and the District of Columbia, demand that "drugs" be sold by registered pharmacists. One finds mention in the Code to "registered pharmacists," "assistant pharmacists," and "apprentice pharmacists." This imputes at once the handling of drugs by highly skilled persons. The Code for the Retail Drug Trade of course recognizes that persons other than retail clerks are necessary for drug stores.

It is also self-evident that on account of these stringent State and District of Columbia pharmacy laws, that if a drug store has only one employee, and he is left alone in the drug store, that person must be a registered pharmacist.

All this points toward the fact that in smaller retail drug stores a minimum code wage is not apt to be a maximum drug store wage, unless the Fair Trade provisions are inadequate, and fair wages cannot be paid. In larger drug stores where greater supervision is possible, and work of the drug store can be segregated and delegated as routine work, work wherein only limited knowledge is required, a large number of minimum wage workers may be possible. A low overhead thus obtained should not control 90 per cent of the drug trade industry.

It must at all times be remembered that *all* fair trade provisions must be important and necessary factors and will control the selling power of all drug store items, controlled by the Code. These provisions must not create an undue hardship on items needed by the consuming public for the protection of health. No item must be placed by provision of the Code, so low that other items will be unduly high in price.

No item can be sold from a drug store without certain fundamental charges entering into the "cost" to the public of the item sold. If these charges do not enter into the sale price, the sale is not an honest sale. It must be remembered that where the burden of the expense of selling one item is not to be found in the cost of that item to the public, then that burden of the selling of that particular item must be added in the cost of another item, or several items. The public must pay the cost of handling all items.

The following figures make clear just what is meant. Figures easily seen at a glance have been chosen.

A drug store's overhead is arbitrarily placed at 30 per cent. By overhead is meant the service furnished by the retail druggist, and includes such items as labor (clerk hire), rent, taxes, etc.

To illustrate, let us say four items, *a*, *b*, *c* and *d*, are purchased, all different, each one of the four costing seventy cents. If each item is sold for one dollar, the consuming public pays the merchant the manufacturer's wholesale price for the item, plus the fair share of operating expense needed to buy (house) and sell these four items.

But if one item, *a*, is sold at 70 cents retail (this is according to the Code of *Fair Competition* for the Retail Drug Trade, definition of "cost") to pay the wages, rent, taxes, etc., that make up the 30 cents overhead on the item, *a*, there is a choice of spreading the 30 cents needed to see, *a*, over *b*, *c* and *d*. Shall the price of *b* be raised to \$1.30 when it is already carrying 30 cents, its full share of wages, rent, taxes, etc., or shall *b* and *c* be raised to \$1.15, or shall *b*, *c* and *d*, be raised to \$1.10 each?

It may be asked what is fair in an alleged "Fair Trade Practice" provision that

allows this unfair practice? Remember this illustration does not allow one cent of net profit

If, *a*, *b*, *c* and *d*, are purchased by different people, whom should these people overpay so one can buy an underpriced item? Why gyp three-fourths of the consuming public?

The NRA should tell the public and stand firmly on the fundamental truth, that if the consuming public is to have drug stores and drug store service, then the consuming public must pay the overhead expenses, must pay the profit that goes into giving adequate protection needed to sell the items peculiar to this Code

When a drug store opens its door each morning, out of sales alone, labor, rent and taxes must be paid. The more items sold at cost, the lower must be the wages and the more unfair to the consuming public must be the price on other items sold

Surplus, excess stock of goods on hand, and credit once possessed to a degree by the retail druggist, has been exhausted by four years of depression

The consuming public has received all this reserve the 60,000 drug store owners once had. Much of the credit exhausted by the corner drug store owner during the last four years went to the unemployed, and to those whose purchasing power was greatly reduced, and is a debt the consuming public can pay by demanding a fair code provision for the retail drug trade, instead of demanding sales without profit

The issue, therefore, must be squarely faced that since surplus excess stock and credit can no longer be counted upon by the drug trade, to-day's drug store profit in sales must now be considered exclusively to pay labor, wages and taxes. Wages paid to drug clerks and other employees at once become consuming public purchasing power

If "recovery" is to come to 90 per cent of the owners of retail drug stores in the United States, under the National Industrial Recovery Administration, the National Recovery Administration and the Code of Fair Competition for the Retail Drug Trade, present-day sales must represent three things, namely, Cost of Merchandise, Overhead and Net Profit

Net profit, if made on sales to day will be used by the retail druggist for a long time to come, to pay bills, and debts accumulated during the past four years of depression, debts that are, respectively, labor charges, rents and taxes, paid after the surplus and reserve were exhausted, now existing largely in debt to manufacturers, and wholesale drug houses

It must be admitted by all, that if *sales* now made do not pay Cost of Merchandise and Overhead, then bankruptcy stares the members of the drug trade in the face, and lack of adequate drug service will become a consumer's problem

If cost of merchandise and overhead are not carried by cost, is not then the Code for the Retail Drug Trade demanding that the druggist fail to pay his employee, fail to pay his rent, fail to pay his taxes, or fail to pay for his merchandise?

Failure to pay for either overhead or merchandise is not in the consumer's interest. It is not in a recovery program. Without profit, purchasing power of dependent employees is slowed up or stopped, and unemployment increases

Alleged efficiency in business cannot be the subterfuge to place *unfair* competitive provision into the Code of Fair Competition of the Retail Drug Trade

When the retail druggists hire labor they cannot go into the household or personal living efficiency of the employee, and thus set a lower wage level

If an employee owns his own home, or has his own orchard, or garden, or if the employee can buy his provisions in large quantities or can make his own clothes, the employer cannot take these things into consideration and pay a wage below the minimum even if the saving is passed on to the consuming public

The Code of Fair Competition for the Retail Drug Trade is for 60,000 drug stores, and unfair trade practices should not be written into it, because a few druggists own their own buildings, or have an advantage in buying, which if allowed to influence the Code provision, will injure a large number of drug stores

The fact must never be lost sight of that alleged efficiency means, keeping down overhead, and the consuming public must know just what keeping down overhead means

The largest item in overhead or expense is labor Therefore, alleged efficiency is making minimum wages, maximum wages Efficiency means, immediately laying off help that may not be needed, and seeing that the number of employees are kept at the minimum Alleged efficiency means, discharging an employee immediately when he shows signs of failing to produce maximum results under minimum wage conditions

Controlling over 90 per cent of the drug business by an alleged efficiency of the less than 10 per cent of the 60,000 retail drug stores, is to repudiate the Declaration of policy, Section 1, of the National Industrial Recovery Alleged efficiency is taking advantage of every employee so that the largest expense item in a store's overhead will be kept down

Consider that during the last four years of depression, workers had no minimum wages Clerks repeatedly in cut-rate stores, took anything for a job Is it surprising that less than ten per cent of the 60,000 drug stores now can show an alleged efficient low overhead made so by a low wage?

Every dollar that helps to improve industry comes out of profit—that is, a sale or service price above cost of goods or materials

Why dodge the issue, why lie about it? A sale without profit is without honor under any code A sale without profit is a direct slap at the unemployment problem

The codes, and the NRA prohibited the employment of labor without the payment of wages Why have not the NRA, and the code provisions, placed a "sale" on an honest basis like a minimum wage? That honest basis is not an honest definition of cost alone Trading dollars never paid a cent of wages to the labor needed to make the swap

To demand that purchasing power be increased before profit is made, is ridiculous It is not a question of which comes first, the hen or the egg

What happened ten million years ago is not being discussed, we are talking about what will happen now Believe it or not—without a hen, you have no egg Without a profitable sale, there is no means to pay the employee Without profit there is no purchasing power, and as profit becomes fair, purchase power rises from the minimum

When 90 per cent of the retail drug trade by official representation in September 21, 1933, asked the NRA for a code, a demand for a fair profit was made also This demand has been repeated almost daily since that time

Ninety per cent of the retail drug trade cannot be wrong when it comes to

knowing what the retail drug store needs, so that employment can be increased and purchasing power can be raised

Ninety per cent of the retail drug trade cannot be wrong when it comes to knowing what are fair and unfair trade practices in the retail drug business

Among all the people of the NRA that have opposed the giving of fair profit over cost to pay labor, rent and taxes, not one person is known to the speaker who is qualified as a pharmacist What American principle is it that allows a few untrained officials to retard an industry that speaks ninety per cent strong—an industry that holds a good share of the public health of 125,000,000 people in their keeping, and have followed a fair trading policy and service here in America, as long as we have had a nation?

REVOLUTIONARY ACCOUNT BOOK OF CHRISTOPHER, JR., AND CHARLES MARSHALL

BY CHARLES H AND MII LICENT R LAWALL

The Marshall Drug Store, which was one of the prominent pharmacies of Colonial America, was founded in 1729 at Front & Chestnut Streets, Philadelphia, by Christopher Marshall, Sr, who had been born in Dublin, Ireland, and who had first settled among the 'Friends' of Bucks Co, Pennsylvania, where he became a member of the Middletown Monthly Meeting In 1735, the store was moved to Chestnut Street above Second Street (now the site of 214 Chestnut Street), where it continued for more than a century at "The Sign of the Golden Ball "

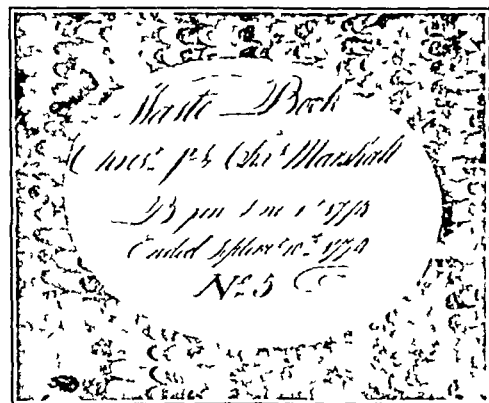


Fig 1 —Upper part of cover of Waste Book

Christopher Marshall, Sr, was a "fighting Quaker," who was prominent in Colonial as well as civic affairs In 1765, he took in with him as his partners, his sons, Christopher, Jr, and Charles, and they succeeded to the business in 1772 Charles Marshall, the active head of the new firm, was an apothecary, druggist, botanist and

chemist, who developed a fine reputation among the leading physicians of the city for his integrity, skill and care He became, in his old age, the first president of the Philadelphia College of Pharmacy, in the archives of which the book was found which furnishes the subject of this study

It is a typical "Day Book," about 8 by 12 inches in size, bound in a cardboard cover, with a typical mottled design of scallops of red, white, green and blue (see Fig 1) It bears an oval label on which is written

"Waste Book, Chris Jr & Chas Marshall Began June 1st, 1774 Ended Septem 10th, 1774 No 5"

"Jacob Fetter, sent by Shank's wagon " (Was this wagon drawn by the original Shank's mare?)

"James Claypoole, delivered to his lady "

"Emanuel Holmes, one vomit, 9 pence "

"A mixture, secundum recipe, delivered by John Day's post "

"Charge against Pritchard—married Widow King "

"Aug 6, Bought 3 cords wood for $\frac{3}{4}$ "

"Delivered by stage driver to Princetown "

"To Capt James Weir to sundry medicines to wright (sic) his medicine box and for grinding a lancet "

We find that Dr Chovet was an almost daily customer Dr Abraham Chovet was a famous physician of Colonial times, who was born in England, educated in Edinburgh, and became a demonstrator of Anatomy to the United Company of Barber Surgeons He later settled in Jamaica, from whence he was driven by a slave insurrection He settled in Philadelphia in 1770 and lived on Race Street above Third He remained an irreconcilable Tory during the Revolution, and yet retained both friends and practice, gave private lectures in physiology and anatomy, and died in 1790, both honored and respected Dr John Morgan, whose name is well known to medical and pharmaceutical historians, and who then lived at Second and Spruce Streets, was a frequent customer, mainly for paints, during the period covered by this book

Another famous customer, whose name appears several times was Christopher Sower, the Germantown printer, who published the first Bible in America and one of America's earliest newspapers—*The Germantown Gazette*

Let us now look at a few of the pages produced in facsimile

Illustration No 1—speaks for itself

Illustration No 2—This page is concerned with items of pharmaceutical interest sent to Dr William Rumney of Alexandria Note the now obsolete name of the first item "Sachar Saturn" for lead acetate Also the second item, the Theriac of Andromachus, which was just about completing its second millenium, but which has now disappeared entirely from use Space and time forbid the detailed discussion of all of the items They are all worthy of detailed consideration by those who have the time and inclination On the following page where this order is completed, we find "Ivory Glyster (sic) pipes," "ivory syringes" and "Crown lancets in a shagreen case "

In *Illustration No 3* we find a number of miscellaneous items that require no explanation This is also true of *Illustration No 4* In *Illustration No 5*, we again encounter a page of items of pharmaceutical interest This is part of an order which was evidently intended for the complete outfitting of a store or a physician's office—probably the latter For this was in the days when physicians had their own dispensaries The name of the customer is Dr William Tillinghurst, but unfortunately the first two pages of this particular order were on the missing leaf, which had been cut out of the book at some time in the past There are five pages of the order remaining, however, of which the third page is produced The cost of the order totaled one hundred and twenty-four pounds, four shillings and ten pence We shall make no detailed comment on the items on this page, except to call attention to the fact that the concluding items at the bottom of the page are all proprietaries, of which there are a number on the next succeeding page At some

future time we may contribute another paper commenting particularly upon the pharmaceutical items in the entire book

In conclusion we would like to call attention to the prices of some of the items which are still in use to-day Calomel cost 30 shillings a pound, Lunar caustic, 20 shillings an ounce, there were three grades of Peruvian Bark, ranging from 20 shillings a pound up to 8 shillings an ounce, mace was sold at 32 shillings a pound and Alexandrian senna brought 8 shillings and sixpence a pound

SECOND NOTICE FROM THE COMMITTEE ON TRANSPORTATION

Members from the eastern states attending the 1935 meeting will naturally travel through Chicago, St. Louis or New Orleans in the United States, or by one of the Canadian lines, and very attractive excursion rates will be in effect, allowing the going and returning journeys to be made by different routes, if desired

There is a large number of routes that may be used for either the going or returning journey, of which a few are as follows

- 1 Through Chicago, Minneapolis and Glacier National Park, with stopover
- 2 Through Chicago, Minneapolis and the Canadian Rockies, with stopovers

A special Chicago party is being arranged to take a combination of routes 1 and 2, which members from other sections are invited to join. Inquiries about this party should be addressed to Prof. E. N. Gathercoal, 701 South Wood Street, Chicago, Illinois, the Chicago member of the Committee on Transportation

- 3 Through Chicago *via* Yellowstone and Rainier National Parks, with stopovers if desired

- 4 Through Chicago or St. Louis *via* Denver, the Royal Gorge, Salt Lake City and San Francisco, with stopovers as desired

- 5 Through Chicago or St. Louis *via* the Grand Canyon, Los Angeles and San Francisco, with side trip to San Diego at small extra expense, if desired

The excursion fares for this season have not yet been announced, but it is expected that they will be about the same as for last year, when they were as follows from several widely scattered leading cities: New York \$126.90, Boston \$133.25, Philadelphia \$122.85, Washington \$120.75, Atlanta \$112.80, Cleveland \$101.35, Detroit \$98.30, Chicago \$86.00, St. Louis \$85.00. Pullman charges are to be added to these fares, with no surcharges west of Chicago and St. Louis

Nine- to twelve-day cruises from Seattle to Alaska will be available at \$85.00 and up, for fare, stateroom and meals. More information about these Alaska cruises and further details will be given in later notices

T. J. BRADLEY, *Chairman*

PHARMACY WEEK IN PHILADELPHIA

Quoting in part from the report of the *P. A. R. D. Bulletin*: Like all other weeks, the week set aside for depicting "Pharmacy of Tomorrow" has come and gone, but unlike most other former celebrations, it will leave impressions and results in activities for years to come. This work was planned by Chairman Anton Hogstad, Jr. and all the members will benefit in proportion to their application of the information in their own business. Those who attended were delighted with the exhibits

THE DEPARTMENT OF THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY

C B JORDAN—CHAIRMAN OF EXECUTIVE COMMITTEE, A A C P, EDITOR OF THIS
DEPARTMENT

HOW SHOULD FUNDAMENTAL COURSES IN CHEMISTRY BE TAUGHT IN A COLLEGE OF PHARMACY?

BY ERNEST LITTLE *

Is there such a thing as pharmaceutical chemistry? Is there such a thing as agricultural chemistry? Are these not special applications of the general science of chemistry? If so, should not our fundamental courses be taught by men who are specialists in their fields rather than by individuals who are able to add a few special applications to the special field for which the student is preparing? Your Editor believes that the fundamental courses in chemistry for pharmacy students can best be taught by those who had training in and full appreciation of the science of pharmacy, provided they are thoroughly grounded in the phase of chemistry they are teaching

Chemistry has developed so rapidly that it is almost impossible to find an individual who is a specialist in more than one narrow field. It is far better to have our pharmacy students taught the fundamental courses in chemistry by specialists in each branch than that they be taught by pharmaceutically trained individuals who have only a general knowledge of chemistry. The happy combination is secured when we have a pharmaceutically trained teacher who is also a specialist in the branch of chemistry he is teaching.—C B JORDAN *Editor*

A few weeks ago Dr Glenn L. Jenkins, chairman of the Committee on Chemistry for the Colleges of Pharmacy and Boards of Pharmacy of District No. 2, requested me to present a paper at the March meeting of these two groups. In accordance with his request I read a paper entitled "How Should Fundamental Courses in Chemistry Be Taught in a College of Pharmacy?" Following the meeting Dr Jenkins stated that he thought the paper should be presented at this meeting and suggested that I send a copy to Secretary Jacobs for his consideration. Having learned to respect the judgment of Dr Jenkins, I again acted upon his suggestion and was requested by Dr Jacobs to present the paper at this meeting. Although it is substantially the same as presented at Baltimore, a number of changes have been made in order to make it more appropriate for presentation to this group.

Following this introduction, which perhaps places altogether too much of the onus for the presentation upon the broad shoulders of one of my respected colleagues, I am prepared to present the question to you for your consideration and discussion.

May I call to your attention that the title of my paper is expressed in the form of a question, rather than a positive statement. "How Should Fundamental Courses in Chemistry Be Taught in a College of Pharmacy?"

At our Madison meeting last August, C J Klemme of Purdue University presented a short paper entitled "Why Organic Chemistry Should Be Taught in the School of Pharmacy." During the presentation of his paper, Mr Klemme stated

"There are some things a pharmacy student should be taught that are not emphasized in general chemistry. The reason for the U S P caution about ether for anesthesia will be plain if an instructor in organic chemistry discusses the formation of peroxides and their possible effects

* New Jersey College of Pharmacy

Discussion of chloroform would explain its decomposition into hydrochloric acid and phosgene and the use of ethanol as a negative catalyst, also why chloroform for anesthesia is made from chloral. The author feels that wherever the physical set-up of the school makes it possible, organic chemistry should be taught to pharmacy students in the school of pharmacy by an instructor who has been graduated from pharmacy."

I quote Mr Klemme at some length in order to present just the opposite point of view from that which I hold. I am not particularly interested in where a fundamental course in chemistry is presented. That is not a matter of paramount importance. I am, however, vitally concerned about how these fundamental chemistry courses are presented and the training of the individuals who present them.

I quite agree with Mr Klemme that the important applications of organic chemistry which he mentions, and, of course, thousands of others of equal importance, should be brought out and adequately stressed somewhere in the pharmacy course, but why try to crowd them into a course in organic chemistry? Is this not the very material from which we should construct our courses in organic pharmaceutical chemistry? Will not more of these important applications be made in materia medica and in manufacturing pharmacy as well? Most colleges of pharmacy can afford no more than three hours of class-room work a week in organic chemistry throughout one college year. Those of us who have taught organic chemistry know that is hardly enough time to present a fundamental course which is adequate to serve as a foundation upon which other more specialized courses may build. Under the best conditions, this foundation cannot be made as broad as we would like to have it, but we can see to it that what we do complete is as firm and strong as possible. Infiltrations of practical applications may make it more diversified, perhaps somewhat more interesting, but certainly weakness, rather than additional strength, will result. I think there is a great deal of wisdom in President Butler's definition of the specialist when he says "A specialist should be a broadly educated man, sharpened to a point."

Not only are there many fundamental principles to be presented but their inter-relationships must be definitely and clearly established. Similarly, parallelisms between organic and inorganic chemistry must be pointed out in order that all the fundamental chemistry courses may be properly coordinated and adequately linked together, thus collectively offering a strong and as adequate a foundation as possible. All professional, technical and applied courses will send deep roots into this foundation and from it their sustenance and building materials are obtained. We cannot expect an adequate, useful, super-structure unless our teachers of professional subjects have been provided with an adequate foundation upon which to build, and unless they also know how to make full use of the materials which have been furnished them.

For example, it is essential that in our courses in general chemistry the students be acquainted with the fundamental principles of hydrolysis. This is, of course, done in all schools. We bring out as clearly as possible what the process of hydrolysis consists of and why the three conditions of (1) large volume, (2) low acidity and (3) high temperature, may be essential to a successful hydrolytic reaction. I doubt the wisdom, however, of taking time to point out to students in general chemistry the important application which is made of this fundamental principle.

in the basic acetate separation of iron, chromium and aluminum in the presence of phosphates. If more time is available, it might rather be spent in further stressing the fundamental principle, leaving the many important applications to be brought up later, as they will be, in their appropriate places. Qualitative analysis is nothing more than an application of general chemistry. The student of qualitative analysis learns very little, if any, new chemistry. If general chemistry has been taught in an applied manner, I fear the teachers of qualitative analysis and of applied and professional subjects will find their work greatly handicapped by an ignorance of fundamentals on the part of their students.

On the other hand, when the student is studying the preparation of a solution of aluminum subacetate, as outlined in the N F V, the fundamental principles of hydrolysis may well be briefly reviewed and the student made to understand that the concentration of acetic acid here recommended is such as to stop or tremendously slow down the hydrolysis when the salt $\text{Al}(\text{OH})(\text{C}_2\text{H}_3\text{O}_2)_2$ is formed, instead of allowing it to continue until the less soluble $\text{Al}(\text{OH})_3 \cdot \text{C}_2\text{H}_3\text{O}_2$ is precipitated, as is the case in the basic acetate separation of iron, chromium and aluminum. The student will also understand why it is that this solution of aluminum subacetate gradually becomes turbid as it is allowed to stand and the greatly retarded hydrolytic reaction slowly proceeds, forming a more basic and hence less soluble salt.

In presenting the Solubility Product Principle, as is done by all teachers of general chemistry, it is not at all necessary that its application in qualitative analysis, showing why cadmium sulphide will dissolve in hydrochloric acid whereas the less soluble copper sulphide will not, be even mentioned.

Again, however, in the preparation of syrup of calcium iodide, after having dissolved the iron wire in an aqueous solution containing iodine, the iron is oxidized to its higher valence before removing it by the addition of portions of precipitated calcium carbonate. This oxidation is carried out because an examination of the solubility products of ferrous carbonate and ferric hydroxide shows that the syrup will contain smaller traces of iron if it is removed by precipitation after oxidation to a valence of three. The rather pronounced evolution of carbon dioxide in this preparation may be pointed to as an evidence of the hydrolysis of ferric carbonate to ferric hydroxide, or a highly basic carbonate, and also as a reason why the precipitation of the ferric iron proceeds as rapidly and completely as it does in spite of the fact that there is so little difference in the solubility products of calcium carbonate and ferric hydroxide.

We see, therefore, that there is a great deal of fundamental chemistry in as simple a process as the preparation of Syrup of Calcium Iodide. It is, however, not essential that this preparation be even mentioned when hydrolysis, oxidation and solubility products are being discussed in the course in general chemistry.

As to the individual who should teach these fundamental courses, my chief concern is that he should be a person fundamentally trained in chemistry. If he be a teacher of organic chemistry, he should have a thorough grasp of the whole field of organic chemistry. He should have a tremendous reserve of the subject as a background, which he is not compelled to draw upon in his every-day, class-room work. An individual so grounded, who is also a graduate pharmacist, should prove to be a very successful teacher of this subject. It seems to me to be more essential that teachers of professional and technical courses should have a profound knowledge of

the fundamentals upon which their specialities rest than that the teachers of fundamental subjects should have in mind all the important and useful applications which their subjects make possible

I sincerely hope that my presentation has not sounded arbitrary or uncommensurate. I realize that there are two well-defined schools of thought in this connection. I realize also that there possibly is no particular task which cannot be well done in more than one way. Who, then, is to say that *this* method of procedure is *the* best?

I have tried, however, to present my ideas as concretely and definitely as possible in order that they may serve as a basis for your consideration and discussion. The point involved is not a minor one. It is of fundamental importance. It is not so long ago that many schools, which are now members of this association, were giving minimum two-year and in some instances part-time, three-day-a-week courses in pharmacy. Under such conditions the question which I am now discussing did not exist. There was not time enough available for the presentation of either fundamental courses in science, or strictly technical and professional subjects. Nondescript combination courses were given, because they were the best that could be formulated under the then existing conditions.

Now, however, conditions have changed. We adopted the three-year course and then the minimum four-year course leading to the Bachelor of Science degree. With twice as much time available, should we simply devote twice as many hours to the same type of courses, or should a fairly distinct line of cleavage appear between the fundamental science courses on the one hand and the professional and technical courses on the other? My answer is that the latter procedure seems preferable.

I, of course, realize that one of the most fundamental principles of good teaching is to present a course in as interesting a manner as possible. I do not object to the *judicious* use of applications in a fundamental course in science. Good pedagogy must be served in a variety of ways and is very properly promoted by various devices and procedures. This concession, which is most willingly granted, does not, however, confuse the issue at stake or detract from the general principle for which I am arguing. I conclude, as I started, with the query "How Should Fundamental Courses in Chemistry Be Taught in a College of Pharmacy?" I am sure you have some decidedly worthwhile ideas on this subject.

Teachers of botany will find much to commend in the following paper presented by Professor C C Albers. The thoroughness of presentation of this phase of the work can easily be extended to other parts of the plants used in medicine and thus make the course in botany a splendid foundation for pharmacognosy.—C B JORDAN, *Editor*

THE BOTANY COURSE AS A FOUNDATION FOR THE PHARMACOGNOSY OF STEM AND BARK DRUGS

BY C C ALBERS

In taking up the study of stems in a botany course, one must, of course, distinguish between aerial stems and underground stems, of which there are several types. One of the chief difficulties of and causes of confusion to the beginning botany student arises in the attempt to distinguish between underground

stems and roots, a difficulty no doubt arising from the common conception that all underground parts of the plant are roots. Nor are aerial stems always evident to him, as in the case of the prickly pear (*Opuntia* species), for example, in which case the real stems are regarded as leaves, another error very likely arising from the popular conception.

Hence, in the first place, it becomes necessary to distinguish between roots and stems, since so many of the important plant drugs consist of underground stems and roots. The differences between these two types of plant organs should then be emphasized as regards the following features. The location of the growing point, the manner of branching, the origin of the branches, buds and leaf scars, the functions of each, and finally the internal or microscopic structure of each. The majority of these differences can be pointed out in the field or in the laboratory, where representative specimens of each may be selected from the stock of drugs. A microscopical examination of longitudinal sections of root tips and stem buds will reveal the difference in location of the growing points.

So far as the underground stems are concerned, the outstanding characteristics of the four types, namely, rhizomes, corms, bulbs and tubers, should be pointed out. A textbook definition of each will scarcely be sufficient. Representative specimens of each (selected from official drugs as far as possible) should be chosen for study. In the case of rhizomes, the leaf scars and bud scales on the surface should be pointed out, as well as the rootlets on the lower surface. Johnson grass, Bermuda or Couch grass rhizomes exhibit these features excellently, as well as the jointed nature of the monocotyl type of stem. The official iris rhizome and ginger rhizomes show the irregular structure of the underground stem and also the numerous root scars (especially of iris) on the lower surface.

For the study of bulbs, the common onion, garlic or even the squill bulb may be used. The outer papery membrane of these, the fleshy scales enclosing the buds, and the roots growing from the lower end should be emphasized. The corm, on the other hand, though it is likewise enclosed in a papery membrane and is erect, short and thickened, does not consist of thick, fleshy scales, but is solid and more flattened from the top to bottom. The attention of the student should be directed to the symmetrical nature of both these types and contrasted with the lack of symmetry of the rhizomes and tubers. Since only one official drug consists of a corm and it is not readily obtainable in the unsliced form, the ordinary gladiolus or crocus corm from the flower shop can be utilized.

As an example of a tuber, perhaps no better type can be found than the common Irish potato. It would be better to have an entire Irish potato plant with the tubers attached to show the manner in which the tubers are attached to long slender rhizomes. The buds or "eyes" should be carefully examined and the terminal and lateral buds noted, as well as the outer corky layer and the rows of vascular bundles internally. Finally, some scrapings from the fleshy part of each of these underground stems should be examined microscopically and the large amount of storage material in the cells noted.

So far as the microscopic structure of the stem is concerned, it would appear that this study would be even more important than the gross anatomy. Whereas the student may understand that the bark of a stem is that portion which he can "peel" off, yet without a knowledge of the structure he will have no conception

as to what constitutes a bark, no knowledge as to what plant elements are present or of the distribution of these in the bark. Nor will he understand without it just why the bark peels off so readily from the rest of the stem. Furthermore, a knowledge of the tissues present in the entire stem and their distribution will enable the student not only to understand better its functions and its general make-up but also to anticipate the elements to be encountered in examining the stem drug in powdered form. Again, the structure of the stem can be made use of in distinguishing between the various types of stems, namely, the monocot type, the dicot type and the fern type. If a distinction of the first two has been made on other grounds, it should be "clinched" by comparing the vascular bundles and their arrangement in these two types, as well as in the fern type. Nor should the comparison end here, but in the case of the dicots should be carried to those exhibiting primary and secondary structures. Then will the student fully comprehend the meaning of such terms as bark and phloem, of herbaceous and woody, of heartwood and sapwood, of periderm and borke, of cortex and cork, of cambium and phellogen, of pericycle, medullary rays, tracheids, sieve cells, collenchyma, and numerous other terms encountered in the official description of the structure of drugs derived from the stem of the plant.

The various types of vascular bundles should be studied in detail not only to ascertain the elements present and their arrangement, but also to observe what changes take place in the bundles of stems which undergo secondary growth. This change is excellently demonstrated by comparing young and old stems of *Memphism canadense*. By this time the term "bark," defined as all tissue regions exterior to the cambium, should mean something to the student, and he should also by this time comprehend the nature of the three parts, namely, the inner, middle and outer parts, and realize why a certain bark drug is stipulated to consist of the inner bark in one case and to be "rossed," or have the "borke" removed, in another case.

For a more detailed study of a bark, Cascara Sagrada lends itself very nicely in transverse section. The three parts show up very clearly, the inner bark with its phloem elements and medullary rays, the middle bark with its cortical parenchyma and patches of stone cells, and the outer bark consisting chiefly of phellogen and cork cells.

If the above amount of detail is devoted to these plant parts in the botany course, the student should be fairly well equipped to take up a study of the drugs consisting of those plant parts.

TWENTY-FIFTH ANNIVERSARY CELEBRATION, HONORING DEAN C B JORDAN,*
MARCH 13, 1935

REMARKS OF ROBERT F. FISCHER, PRESIDENT OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

To review the progress of American Pharmacy in the past quarter century in three minutes, as requested by the Committee on Arrangements, appears to be a rather formidable task. If we bear in mind, however, that the recorded history of pharmacy covers 40 centuries, it is quite obvious that the historian of the future will probably discuss this period—which looms so large in the minds of the present generation—in comparatively few words. At the rate of 3 minutes

* Purdue University School of Pharmacy

per quarter century it would take just 8 hours of continuous talking to review the accomplishments of our profession from its beginnings in the mists of antiquity to its present status in the fogs of the New Deal

In twenty five years we have lived through the entire or partial administrations of six Presidents of the United States We have lived through one of the greatest wars of history We have baptized and buried prohibition We have gambled our way into and out of prosperity, and through it all Pharmacy seems to have made some real progress

A quick bird's eye view of the situation indicates

- 1 A sharp trend toward better regulation of the commerce in drugs and medicines
- 2 An industrial development which, in line with other national trends, has favored the expansion of corporate interests at the expense of the small operator, and
- 3 A distinct elevation of our professional standards

In 1910 only three states required pharmacists to possess a college education The restrictions of the sales of narcotic drugs were inadequate Restricting the sale of hypnotic drugs had hardly been thought of Federal Food and Drug regulations were in their infancy The Harrison Anti narcotic Act was just in the making To day, after the lapse of 25 years we find two thirds of our states requiring pharmacists to be college graduates and pharmacists urging still more stringent regulations for the control of adulteration, misbranding and advertising of drugs and with a fair prospect of obtaining them

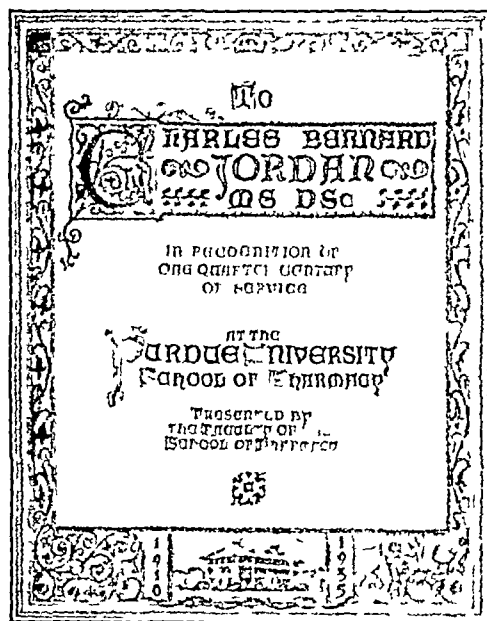
We have accomplished strict regulation of the dispensing of narcotics and there is an increasing demand for the regulation of sales of hypnotics as well as a more general public appreciation of the need for confining sales of all drugs, medicines and poisons to qualified pharmacists The experimental work of pioneer states in this field has in many cases led to standardized national and state procedures The closer cooperation of state and national pharmaceutical organizations is responsible for much of this progress Monthly publications full time secretaries, legal advisers and specialized activities in our state and national associations are all developments of the past quarter century

The World War gave a great impetus to the medicinal chemical industry in the United States We are no longer dependent upon Europe for synthetic organic chemicals The development of the machine aided and abetted by the difficulties in obtaining supplies of alcohol for manufacturing purposes on a small scale both during and since prohibition has removed much pharmaceutical manufacturing from the retail drug store We can only marvel at the development of the manufacturing, control and research facilities of drug manufacturing corporations during the past twenty-five years, even as we regret to see the original servant of the pharmacist apparently becoming his master

The chain store movement in the retail drug field is largely a development of the past quarter century While it has undoubtedly had a stimulating effect upon the merchandising activities of retail druggists its effect on the professional side has been unfortunate for it has not only detracted the attention of retail pharmacists from their primary function but has introduced into their establishments a variety of merchandise in which they ordinarily have no interest and which has made them a target for complaint from merchants in other fields and has had a tendency to obscure their professional status in their own communities

To combat the unfavorable developments resulting from mass production and mass distribution leaders in pharmacy have resorted to the most formidable weapon at their command—education To paraphrase a biblical expression, "where there is vision the people will live" and vision is the result of education The most encouraging development in American Pharmacy during the past quarter century is the rapid increase in standards of education and licensure From no general high school requirement for college entrance in 1910 to not less than 4 years in 1923 and from a short 2 year college course in 1910 to a minimum 4 year course on an academic basis in 1932 is the record of progress stated briefly That this minimum educational requirement is in force now in more than two-thirds of the States of our Union and that the courses given by the American Colleges of Pharmacy have reached the high standard now obtaining is due in large measure to the foresight and determination of a relatively small group of leaders in American Pharmacy

Right here in Indiana and on this very campus there has labored long and faithfully an individual to whom the last 25 years must have passed very rapidly and who can look back on them with considerable satisfaction



Memorial Plaque honoring Dean C B Jordan, presented by the faculty of the School of Pharmacy, Purdue University

While turning out a new generation of pharmacists in his own college and leaving upon them the imprint of his personality and passing on to them the idealism of a noble calling, he has also for many years exercised a judicious and wholesome influence upon the destinies of pharmaceutical education throughout the United States. I need not tell you that I refer to Dean Jordan.

His services as president and later as chairman of the Executive Committee of the American Association of Colleges of Pharmacy have been of a high order. He has served the AMERICAN PHARMACEUTICAL ASSOCIATION as secretary and chairman of its Section on Education and Legislation and as vice-chairman and chairman of its House of Delegates.

It is my great privilege to bring the greetings and congratulations of the AMERICAN PHARMACEUTICAL ASSOCIATION to Dean Jordan and to Purdue University on this very enjoyable occasion and to wish for both the Dean and the University many additional years of the happy and fruitful association which has brought great credit to them as well as to American Pharmacy.

CALIFORNIA ASSOCIATION

The 1935 convention of the California Pharmaceutical Association at Hotel Coronado, San Diego, June 23rd-26th, with the added drawing power of the International Pacific Exposition is expected to establish an attendance record for state pharmaceutical conventions.

A Scientific Pharmacy section, a distinct innovation this year, will round out a well balanced program of business and pleasure.



Annual Meeting of Boards and Colleges of Pharmacy, N A B P District No. 2 at the AMERICAN INSTITUTE OF PHARMACY, Washington, D C March 11 and 12, 1935

PROCEEDINGS OF THE LOCAL BRANCHES

"All papers presented to the Association and Branches shall become the property of the Association with the understanding that they are not to be published in any other publication prior to their publication in those of the Association, except with the consent of the Council

—Part of Chapter VI, Article VI of the By-Laws

ARTICLE III of Chapter VII reads "The objects and aims of local branches of this Association shall be the same as set forth in ARTICLE I of the Constitution of this body, *and the acts of local branches shall in no way commit or bind this Association, and can only serve as recommendations to it* And no local branch shall enact any article of Constitution or By-Law to conflict with the Constitution or By-Laws of this Association "

ARTICLE IV of Chapter VII reads "Each local branch having not less than 50 dues-paid members of the Association, holding not less than six meetings annually with an attendance of not less than 9 members at each meeting, and the proceedings of which shall have been submitted to the JOURNAL for publication, may elect one representative to the House of Delegates "

Reports of the meeting of the Local Branches shall be mailed to the Editor on the day following the meeting, if possible Minutes should be typewritten with wide spaces between the lines Care should be taken to give proper names correctly and manuscript should be signed by the reporter

BALTIMORE

The regular monthly meeting of the Baltimore Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held March 15, 1935, at the Emerson Hotel, President Wm F Reindollar in the chair The minutes of the February meeting were read and approved The meeting was then taken over by the Debating Society of the School of Pharmacy, University of Maryland The occasion was a debate between the School of Pharmacy of the Medical College of Virginia and the School of Pharmacy of the University of Maryland The subject of the debate was

Resolved, That the sale and distribution at retail, of drugs medicinal preparations and sick-room supplies be limited by law to the retail pharmacy

For the Affirmative School of Pharmacy of the Medical College of Virginia Speakers Toney Mehford Richmond, Va , John Raymond Hurt, Drakes Branch Va , Woodrow Byrum, Suffolk Va , Felix Clyde Jennings, Norfolk, Va (Alternate)

For the Negative School of Pharmacy of the University of Maryland Speakers Sylvan Silverman, Milton J Wilder, Harry Peretz, Alex Ogurick (Alternate)

The judges for the debate were Dr Julien Gunn of the Johns Hopkins University, Hugo P Wise of City College, and Paul Clarkson of the Legal Department of the Consolidated Gas and Electric Co , Baltimore

Each speaker had eight minutes for the presentation of his topic with a five-minute rebuttal At the conclusion of the speeches the judges cast a unanimous vote in favor of the team representing the School of Pharmacy University of Maryland, who upheld the negative side of the debate

President Reindollar extended a hearty vote of thanks to the members of both debating teams for their efforts and congratulated the winning team

Approximately one hundred were present with many students from the School of Pharmacy
C JELLEFF CARR, *Secretary Treasurer*

CHICAGO

The monthly meeting of the Chicago Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held March 19th, at the University of Illinois College of Pharmacy

The speaker of the evening was Dr John C Krantz Jr , Chief of the Bureau of Chemistry Department of Health of the State of Maryland and Professor of Pharmacology at the Medical School of the University of that State His subject was "Pharmacy in the Quest for Health "

Dr Krantz began his discussion of "Pharmacy in the Quest for Health," by stating that disease is the arch enemy of mankind. It has haunted his every activity from the superstitious dweller in the cliffs to the occupant of the modern sky scraper as you know him to day.

"It can be actually said that the progress of man on this planet is the result of his efforts to beat back the ever present menace of disease. Trace down through the centuries the discoveries that have helped to prolong life—to day drugs that were looked upon as almost necessary in years past have given way to bacterial serums and other medicaments administered by hypodermic injection.

"Now, let us try to point out what effect these trends might have on pharmacy as we know it and as it is to be practised in the future. In most all serious illnesses we find that before long the patient is hospitalized, where he can be treated more adequately. Deliveries are performed 75% in hospitals to day. Syphilis and malignant diseases find their way in and out of hospitals. Most of the medication carried on in the home years ago is now carried on in hospitals. There in modern hospitals, pharmacists who devote all their time to prescriptions are able to compound a larger number than those who are working in a larger diversified field. A few pharmacists in well equipped hospitals can do the work of many pharmacists in stores where their efforts are divided. Many pharmacists have found out that they have to make a living following more commercial pursuits rather than the profession for which they have qualified themselves.

"The trend to day is toward simpler prescriptions which is due to the teaching of modern pharmacology in the medical schools to prescribe simple drugs. The more complicated the prescription, the more chance of failure. Choose drugs the therapeutic value of which has been tested. We formerly believed that it was necessary to have an infusion of digitalis now all this can be accomplished by using the powdered drug.

'I say that the stress that the Schools of Pharmacy place on incompatibilities is wasted effort. Pharmacy should say we are through with this medical mess we are interested in the welfare of the patient and the patient's welfare is not served by complicated medicines. Don't we have some obligation to the patient? If those people practicing medicine to day do not discontinue to write incompatibilities we should take some step to stop them, and I believe it would stand as a lasting monument to Pharmacy.

'In say 1915, the manufacturing houses began to make serious inroads into the preparation of medical products and the pharmacist has gradually drifted away from this preparation.

"We take a pharmacy so called in which the pharmacy part of the store has reached the point of vanishing significance and we send a prescription to it that calls for sodium bromide, potassium bromide and strontium bromide. A copy is asked for and when wrapped with the prescription automatically becomes a part of the prescription. If the strontium bromide is left out of the prescription or substituted with one of the other bromides the pharmacist may be prosecuted under the Pure Food and Drugs Act. The man does not realize that he is a definite part of the public health program and is not taking his work seriously.

We sent out into the state prescriptions for one half ounce of a saturated solution of potassium iodide. As a result we found prescriptions varying from 103% to a minimum of 55%. This means that if you were to take such a prescription to be filled your chances are even of getting an 88% solution. It should be 100%.

'Not many months ago a doctor came into the laboratory for a 1-5000 solution of silver nitrate. He said that there was only one store in the city to which he would trust the filling of the prescription. Let us say that this was uncalled for, but nevertheless it represents the attitude of the doctors toward pharmacists who are surrounded with commercial pursuits to a point where his doctor has lost faith in him.

"You might say we pharmacists only need to have the doctor on our side. A chemist wanted methylene blue for intravenous injection for a member of his family and wanted it prepared exactly right. The doctor said there is a certain druggist who can make this solution for you. The fellow threw up his hands, saying 'I don't intend to inject it into my mother if any retail druggist has had his hands on it.' He does not picture a druggist as one interested in methylene blue. He has so diversified his efforts and energies that he cannot be interested in intravenous injection of methylene blue.

"Pharmacists have broken faith with their public health responsibility. Now I am

interested in the public health and I am very interested in the pharmacist retaining his responsibility in the community as a public health service. Let me tell you why I think this is true and my statement is justified. Recently a preparation, a patented herb concoction, came into our community. Blazed in the headlines of the newspapers, this new preparation—for reducing—will take bile out of the liver, will relieve stomach troubles, is excellent for diseases of the bladder and has proved its worth like no other drug in kidney troubles. I take it they mean Bright's disease and arthritis. Anyone can see it is advertised for sale in all leading drug stores. Those pharmacists do not say I know this is wrong. No, they do not say this, they stock it because the profit is long, the advertising will bring sales and they become a part and parcel of that vicious system which robs a man when he is down, and I am sure that even in his most vicious moments Jesse James would not do that.

I don't think you need a Moses. You are struggling with certain laws and with your profession the need for which in large numbers is rapidly diminishing, and I don't think it is going to get any better. Here are my solutions. Pharmacists must be motivated by service and not by profit. We must, if we are to survive as a profession, include the science of the action of drugs in health and disease. One of our great difficulties in pharmacy has been that we have not stressed professional service to the point where we can charge for it. How much profit are we going to make on the compounding of a prescription? We should think of the drugs as insignificant and the charge should be for service. Until we get the public to realize we have a right to charge for service we cannot be looked upon as a profession, for one of the marks of a profession is that it has a legitimate right to charge for service.

'Our schools must realize, if they do not want to run the profession, this is no time to produce an ever increasing number of pharmacists to practice in this none too fertile field when there is a diminishing need for them. I congratulate you that you have required one year of college work prior to entrance to your Pharmacy College.

'Do our colleges realize that they have within their power the potential means to alleviate human suffering? Do they have time for service or are they pounded all day long by teaching until there is not an ounce of energy left? You can see it everywhere. Research is the promised land which lies before you, my bidding is to enter into it.'

LAWRENCE TEMPLETON, *Secretary*

NEW YORK

The March 1935 meeting of the New York Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held on Monday evening, March 11th, in the College of Pharmacy, Columbia University. About forty-five members and their guests attended.

President C. W. Ballard presided, the report of the secretary was read and approved.

Chairman Robert S. Lehman of the Committee on Education and Legislation, reported the following:

Pure Food and Drug Legislation—Hearing on S. 5, Senator Copeland on March 2nd. A large number of persons appeared before the Sub-Committee of the Senate Commerce Committee speaking pro and con. It is surmised that the bill will again have to be re-written. It is said that Senator Copeland will accept changes advocated by Mr. Charles Wesley Dunn.

Toilet Soaps are now under the Retail Drug Code.

H. R. 6246, Representative White, prohibits manufacturer's special rebates or discounts to chain or branch store organization.

H. R. 5062, Mapes. This bill will prevent unfair discrimination in price between different purchasers of commodities and give the same prices to the small as the large buyer.

S. 1923, King. This bill states that it will not be unlawful for trade-code members or others to cooperate to defend themselves against unfair or deceptive practices or acts. This should enable price standardization by agreement.

S. 944, Wheeler, Federal Trade Commission Bill. Reported upon favorably by the Committee. Forbids price discrimination, and directs the Federal Trade Commission to enforce the law.

Chain Store Laws—The West Virginia Chain Store Tax Law has been declared valid by the Supreme Court of the United States. There are now 37 chain store tax laws before the legislatures of 28 states. It is believed that most of these laws will be enacted in some form or other.

According to amendment to the Alcohol Regulations pharmacists may purchase industrial alcohol in containers of one gallon, until April 15, 1935, after that date purchases must be in containers in excess of one gallon

State Legislation—Bills, Assembly No 432, 772, Introductory No 422 Senate No 415, Introductory No 398, the Fair Trade Bill (Junior Capper-Kelly Bill) This bill has a good chance of passing this session write or telegraph your senator and assembly man in favor of the measure

This law has been in effect in California for over a year and has been of immense benefit to the retail trades All manufacturers of trade marked drug merchandise are cooperating with the retail distributor in that state

Bills, Assembly No 499, Introductory No 489 Senate No 418, Introductory No 401 This is the Prophylactic Bill, hearing on the same on March 5th Prospects of passing are good but you should also write or wire the senators and assemblymen in favor This law would limit the sale of all gynecological medicines, remedies and appliances to stores registered by the New York State Board of Pharmacy

A bill providing for a chain store tax is before the Legislature possibility of some legislation this session

A bill for the enforcement of the Code of Ethics of the State Pharmaceutical Association has a good chance of being enacted This bill provides that the Board of Pharmacy may revoke a license for unethical or unprofessional conduct the latter to be determined in part by the Code of Ethics of the N Y State Pharmaceutical Association

Chairman Steiger, of the Committee on Progress of Pharmacy, was then called upon for his report which follows

Both the scientific sections and the advertising columns of the journals indicate an increasing interest in vitamins Glandular products and new hypnotics are also conspicuous in the literature

Joseph Roe in *Science* (Vol 80, page 561) describes a color test for Vitamin C When ascorbic acid is boiled with HCl CO is given off and furfural is formed This can be detected by the use of aniline, phloroglucinol tests

According to the *Oil, Paint & Drug Reporter* (March 4 page 49) Charles L. Huisking, upon returning from a trip through Europe reports that Norway and other countries by extensive scientific study hope to demonstrate the superiority of pure natural Cod Liver Oil over the so-called high vitamin oils and similar products (*Oil, Paint & Drug Reporter*, February 25, page 46)

Experiments conducted by the Division of Radiation and Organisms of the Smithsonian Institute, indicate that certain wave lengths of light are specifically 'poisonous' to bacteria algae and various parasites These rays are found in the invisible ultraviolet between wave lengths of 3900 and 1850 "Ångstrom units" There is extreme specificity within this range a difference of a few Ångstroms apparently marks the difference between innocuousness and virulence for some of the lower organisms upon which the experiments have been tried

Guteros and Schmelkes, in the *J of Biological Chemistry* (Vol 107, pages 235-239) report on the compound action of sodium hypochlorite, chloramine T and azochloramide on organic substrates The authors compare the rate of disappearance of available chlorine with various organic substrates and germicidal activity Their conclusion is that the chloramine T is a better germicide than sodium hypochlorite and that azochloramide is more useful than either, in the presence of organic matter

An appeal to pharmacists to throw off the spirit of apathy appeared in the *Chemist and Druggist*, London, February 2 1935 It formed the theme of the presidential address to the Liverpool Chemists Association on January 24th Conditions in England are evidently similar to those here

President Clubb, said in part "If there is one question which has been discussed 'ad nauseam' in the pharmaceutical press it is the perennial one, What is wrong with pharmacy? Every writer on the subject has fulminated against the encroachment of outside traders on our livelihood The menace of the multiple stores (chain stores) the competition of charitable and municipal clinics, etc are old stories" He concludes that these examples are the symptoms of a disease—"Apathy"

A communication was read announcing the date, place and tentative program for the annual convention of the AMERICAN PHARMACEUTICAL ASSOCIATION. Attention was called to the fact that a communication was received from Mrs. Jacob Diner in which she stated that Dr. Diner would be unable to attend future branch meetings and that we might remove his name from the mailing list. Action was taken upon this as follows: Dr. H. V. Army moved that Dr. Jacob Diner be made an honorary member of the New York Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION. This motion was seconded by Mr. Lehman, voted upon and passed. The secretary was directed to write to Mrs. Diner and inform her of this action by the Branch.

Dr. Ballard then called attention to a letter which he had received from the Executive Committee of the New York Pharmaceutical Conference asking that two representatives be sent from the New York Branch to act for the Branch at an organization meeting of the New York Pharmaceutical Council, which will replace the New York Pharmaceutical Conference. In connection with this Dr. Schaefer presented the following resolution and moved for adoption. This was seconded by Dr. H. V. Army, was voted upon and passed:

'WHEREAS, The N. Y. State Pharmaceutical Association is inviting local pharmaceutical organizations to become affiliated with it, and

"WHEREAS, The present N. Y. Pharmaceutical Conference is about to be disbanded and the N. Y. Pharmaceutical Council is now being organized under the auspices of the State Association, and

' WHEREAS, All local organizations which approve of affiliation with the State Association are eligible to send delegates to the organization meeting of the new Council, be it

"Resolved, That the N. Y. Branch of the A. P. H. A. approve of the idea of affiliation with the State Association and with the new Council provided, however, that the rules of affiliation and the Constitution and by-laws of the Council as eventually drawn up will contain and include nothing contrary to the principles of our parent organization nor obligate us to any financial outlay and further be it

' Resolved, That the president of our Branch be directed to appoint two representatives and two alternates from our membership to act for the Branch on the present Council Organization Committee '.

Dr. Ballard commented on this reorganization move, saying that he favored the move since he believes that it was in the right direction in coordinating legislative activities among pharmaceutical organizations and that it ran parallel with the thoughts expressed by President Fischels at the testimonial dinner recently held in his honor.

Fred Schaefer and Robert S. Lehman were appointed to act for the New York Branch with Hugo H. Schaefer and William C. Anderson as alternates.

This completed the business part of the meeting. Dr. Ballard then called upon the speaker for the evening, Dr. Erich Meyer of the Industrial Research Division of L. Sonneborn Sons, Inc. The complete text of Dr. Meyer's address follows:

WHITE MINERAL OIL AND PETROLATUM IN PHARMACEUTICAL AND COSMETIC PRACTICE

BY ERICH MEYER *

It is surprising that very little information is found in to-day's chemistry textbooks or even in handbooks on chemistry, medicine and pharmacy regarding the chemical and physical characteristics of white mineral oils and petrolatum. Rarely does one find more than just a few lines, simply indicating that such products do exist, and often such short references are rather confusing and misleading since, unfortunately, these products are known under many different and frequently misleading names. This lack of information in reference literature is the more surprising since white mineral oils and petrolatum are very important ingredients of to-day's pharmaceutical and cosmetic preparations.

Both white oil and petrolatum are crude oil derivatives. Crude oil itself is a complex mixture of a large number of different hydrocarbons. Only recently has the petroleum chemist been

* Dept. of Industrial Research, L. Sonneborn Sons, Inc., New York.

able to separate and identify a few of them. The generally accepted theory of the origin of crude oil is that which assumes the putrefaction of animal and vegetable matter under water æons ago. With the shrinkage of the earth's crust and its attendant pressure, the crude oil has been filtered through various strata as it was forced from one place to another by these phenomena.

Occurrence of Crude Oil—To day we find crude oil trapped in sandstone, limestone and other so called oil-bearing formations beneath the earth's surface on almost every continent. In Asia the best fields are found in Burma, in the Dutch East Indies, in Persia and in Mesopotamia. In Europe, crude oil is found mainly in Russia, Roumania and Poland. But the largest producer of crude oil is the North American continent. There are tremendous fields in Mexico and even larger ones in California, Texas and Oklahoma. The only field in the eastern part of the United States is the so called Pennsylvania field.

Crude Oil of Various Types—Crude oil can be classified as to its chemical structure into three different types, namely, naphthene base crude, paraffin base crude and mixed base crude. Naphthene base crudes are found on the Gulf Coast, in California, and in many parts of Russia. They are composed mainly of naphthene hydrocarbons of cyclo paraffin and cyclo olefin character. Paraffin base crudes are principally found in the Pennsylvania field. The name "paraffin base" refers to the atomic arrangement and should not be confused with paraffin wax. A paraffin base crude is mainly composed of straight chain hydrocarbons of the paraffin series. Mixed base crudes are found in the Mid Continent field, such as parts of Texas and Oklahoma. As the name indicates, these oils contain both types of hydrocarbons.

Origin of White Oil Refining in Russia—White Mineral Oils are refined from all three types of crude oils. According to reliable information, the present process of making white mineral oil was invented by J. Markovnikov, a Russian chemist, about 1887. In 1895 another Russian, Grigori Petroff, perfected the process to a point where it was commercially useful. Petroff undoubtedly used Russian crude because at that time the only known crude oil in Europe available for the purpose was Russian crude. A small refinery was established in Riga, then in Russian territory, and thus white mineral oils became first known as "Russian Oils". Ever since all white oils intended for internal consumption have been commonly termed "Russian Oils" without regard to the origin of the crude or the geographical location of the refinery. Thus the term "Russian Oil" is rather the description of the refining process and not the name of a definite type of oil.

Principle of White Oil Refining—In the refining of white mineral oils, at first the light fractions such as gasoline, naphtha, kerosene and fuel oil are distilled off. The remaining residue is further fractionated and one of these fractions represents the raw material for white mineral oil. The main object in the refining process of white mineral oils is the removal of the unsaturated hydrocarbons. These unsaturated compounds are chemically unstable and, among other undesirable features, give the unrefined oil its typical odor and taste. The refining consists principally of treating the oil with sulphuric acid, subsequent washing with alkalis followed by various filtration processes. The result is an oil which is perfectly colorless, tasteless and odorless and free from unsaturated hydrocarbons. The mere fact that an oil is colorless or waterwhite, of course does not in itself signify that it is a completely refined mineral oil in the medical sense of the word, as it is possible to obtain a waterwhite appearance by simple filtration.

Removal of Unsaturation—an Essential—From a theoretical standpoint it is obvious that all unsaturated compounds and other impurities must be completely removed to render the oil fit for internal use. Similarly, oil for cosmetic purposes must be free from unsaturates in order to guard against skin irritations traceable to the oil. Furthermore, it is highly desirable that a white mineral oil for cosmetic use not only should be colorless and odorless but should remain so. It stands to reason that only a mineral oil which has been completely refined, and is thus free from unsaturates, possesses sufficient stability.

The U S P Acid Test—In order to determine to what extent the unsaturated hydrocarbons have been removed from a mineral oil, the so-called acid test is generally employed. This test established by the U. S. Pharmacopœia is designed to show the true degree of refinement of an oil. Five cc. of the oil are heated with 5 cc. of 93% to 95% sulphuric acid in a water-bath for ten minutes and the mixture shaken at intervals of 30 seconds. Applied to partially refined oils, the acid will turn a dark yellow, brown or even black, but with a true white mineral oil the color will change only slightly.

The present U S Pharmacopœia specifies that a U S P white mineral oil, when subjected to this test, should not become darker than pale amber. This rather vague specification was a source of many disputes in the past because no two people could agree as to what is pale amber and what is darker than pale amber. Therefore, most refiners of U S P white mineral oils have developed a color scale of their own in order to enable them to express numerically the color of the acid layer.

However, upon the suggestion of H V Arny, the U S Pharmacopœia in its 11th edition (now in preparation) has finally adopted a definite color standard for the acid test by which white mineral oils refined to U S P purity can be easily distinguished from those of lesser degree of refinement. This color standard, which is a combination of solutions of cobalt chloride, ferric chloride and copper sulphate of definite concentrations, seems to fulfil all the requirements to be expected from a U S P standard. The various reagents are readily obtainable and are permanent.

White Mineral for Intestinal Lubrication—One of the first physicians to recommend white mineral oil for intestinal lubrication was Sir Arbuthnot Lane. However, it was not before 1894 that first mention of white mineral oils appeared in the U S Pharmacopœia. To day, the U S Pharmacopœia distinguishes between two grades of White Mineral Oil or Liquid Petrolatum, as it is officially designated in the Pharmacopœia. One which has a kinematic viscosity below 0.370 at 100° F is called "light" and the other which has a kinematic viscosity above 0.381 is called "heavy." Usually, the viscosity of a white mineral oil is determined with a Saybolt Universal Viscosimeter at 100° F, and expressed in Saybolt seconds. Thus a kinematic viscosity of 0.381 at 100° F is equal to a Saybolt viscosity at 100° F of 175. White Mineral Oils are refined to-day having viscosities as high as 345 Saybolt seconds at 100° F.

(a) *Significance of Viscosity* If white oil is used straight as such for intestinal lubricating purposes, it is advisable to specify an oil of a viscosity as high as possible because it is generally believed that the higher the viscosity the lower the tendency toward leakage.

(b) *Significance of Cloud Point* A further important requirement of a white mineral oil for intestinal lubrication is a low cloud point which serves as an indication of the absence of solid paraffins which would tend to cloud and solidify the oil at low temperatures. The oil should not become more than opalescent when cooled to 0° C.

However, a cloud point caused by the presence of solid paraffins should not be confused with a cloud point caused by traces of moisture in the oil since a trace of moisture which might be absorbed by the oil will also cause cloudiness when cooled to 0° C. Even with the greatest care it is very difficult to altogether exclude absorption of moisture, particularly in humid atmosphere, since a white mineral oil of high purity is quite hygroscopic. The absorption of minute quantities of moisture often occurs while filling the liquid into containers, though this operation may be performed with the utmost speed. Absorption of moisture also may occur when bottles of white mineral oil are left open for any length of time. A poor cloud test, due to the presence of a slight amount of moisture, is of course, not a serious matter and therefore should be well distinguished from clouding caused by the presence of solid paraffins. For this reason, the British Pharmacopœia specifies that the oil shall be *dried* prior to determination of the cloud point. The proper procedure to dry white mineral oil is to heat the oil to 110° C and then allow it to cool in a closed desiccator. The use of a desiccator is very important because the hot oil has a strong tendency to absorb moisture, and if left to cool in a humid atmosphere, it may absorb so much moisture that it would become cloudy even at ordinary temperature.

(c) *Significance of Specific Gravity* Specific gravity also has a definite significance in judging the suitability of an oil for intestinal lubrication. Recent investigations indicate that the action of white oil in the intestinal tract is not only one of simple lubrication but it seems that white oil at the same time emulsifies with the intestinal contents, thus exerting a softening influence. Therefore, a white mineral oil of high specific gravity—a specific gravity which is as close as possible to that of water, namely, 1—will more readily emulsify than one of low specific gravity. Furthermore, information as to the specific gravity of a white mineral oil is often found helpful in determining the source from which the oil comes or the type of base of which it is composed.

(d) *Significance of PbO Test* The lead oxide test as described in the U S Pharmacopœia, is designated to show up sulphur or injurious sulphur compounds. It is safe to say that all white mineral oils offered for medicinal purposes show absolutely negative lead oxide tests.

Source of Crudes for White Mineral Oils—Heavy white mineral oils are mostly obtained from

Gulf Coast and California crudes and also from Russian, Roumanian, Venezuelan and Peruvian crudes. They are composed of saturated naphthene hydrocarbons which are cyclo paraffins of the hexamethylene type with single bonds only. So-called Russian Oil is refined mainly from Russian, Roumanian, Venezuelan and Peruvian distillates. The refining, however, is not done in Russia. Instead, the oil stock is sent to Germany and other countries for refining. Thus the term "Russian oil" is apparently a misnomer. In chemical composition white oils made from Russian and American crude are practically identical. There is no chemical test for determining the source of the oil. From the standpoint of purity, imported oils are usually equal to American oils. Usually so called Russian White mineral oils have a lower specific gravity than American white mineral oils of the same viscosity, which is a fairly accurate method of identification.

White Oil Emulsions—Aside from their use for intestinal lubrication, straight U S P heavy white mineral oils are also employed in emulsified form. Usually, such emulsions contain about 50% to 70% of white mineral oil emulsified with water by means of acacia, agar agar, tragacanth or similar gums. Since the use of these emulsifying agents tends to make the finished product rather heavy, a lower viscosity oil is sometimes selected. Absolute freedom from any and all impurities—even those which are not detectable by means of the acid test—is particularly essential for white oil emulsions since even traces of such foreign substances tend to partially invert the phase of the emulsion.

Nasal Sprays—Another pharmaceutical application of white mineral oils is in the manufacture of nasal sprays and nose drops. Most of these preparations are made up with a white mineral oil of about 60 to 90 viscosity as a carrier, because it has been found that an oil of this viscosity is distributed readily through the nasal mucosa, bringing the active principles to all affected parts. Furthermore, oils of this viscosity range are tolerated even by infants. The oil should have a cloud point sufficiently low so that the finished product will not cloud at ordinary temperature. The active principles usually employed in nasal sprays include camphor, menthol, eucalyptol and thymol, as well as ephedrine salts or anhydrous chlorobutanol. These latter compounds have the property of contracting the mucous membranes, thus making breathing easier.

Baby Oils—White mineral oils used in the preparation of so-called 'baby oils' range in viscosity from 75 to 100 Saybolt seconds at 100° F. White mineral oils are preferred to vegetable oils since the latter, particularly upon exposure in a thin film, form fatty acids which tend to develop a varnish-like film and thus often have a tendency to clog the pores with consequent irritation to sensitive skins. Particular care should be exercised in selecting a white mineral oil which is as completely refined as the U S P standard prescribes. Incompletely refined oils contain a varying amount of unsaturated hydrocarbons as impurities. These unsaturated hydrocarbons seem to have a definite irritating effect on the skin.

Ointments and Creams—It is for this reason that white mineral oils of the U S P purity were introduced for the manufacture of ointments, salves and creams of all kinds as, for instance, cold creams, cleansing creams and many other types. White mineral oils of U S P purity are extensively used to day for these purposes and their absolute purity, as indicated by their U S P acid test and their complete lack of odor and color have made them one of the most dependable raw materials of the cosmetic industry.

Some Essential Requirements for Cosmetic White Oils—In determining the proper viscosity of a white mineral oil for cosmetic creams, it was found that a viscosity of about 65 to 75 Saybolt seconds at 100° F is most satisfactory. An oil of higher viscosity lacks quick penetration and tends to make the finished cream excessively greasy. On the other hand, an oil of a lower viscosity may result in a product of thin body. One of the most important requirements of white oil in such preparations is to accomplish the liquefying of the cream not only as quickly as possible but it is equally as important that, with the help of the oil, the cream spreads evenly over the skin in a thin film.

A further interesting fact is that white mineral oils of paraffin base type are usually preferable to white mineral oils of naphthene base type in the manufacture of pharmaceutical and cosmetic creams. One of the typical differences between a paraffin base oil and a naphthene base oil is their pour points. While most of the naphthene base oils solidify at temperatures of about 15° F to 0° F or below 0, paraffin base oils have a much higher pour point, namely about 25° to 50° F. The high pour point of paraffin base oils is caused by the presence of solid hydrocarbons in the oil. It appears that these solid hydrocarbons have a better affinity for those materials

which the cosmetic manufacturer adds to the oil in the course of his manufacturing process. Thus it has been found, for instance, that paraffin wax and similar materials used in cosmetic preparations blend better with a paraffin base oil than with a naphthene base oil. Therefore, as a rule, paraffin base oils give a smoother cream and the tendency toward separation of the liquid from the solid ingredients is reduced to a minimum.

As mentioned before, paraffin base oils usually can be identified by their higher pour point and by the fact that at the same viscosity paraffin base oils have lower specific gravity than naphthene base oils.

Liquid Brilliantine—White mineral oils are used as a base for liquid brilliantines. A low viscosity oil—about 50 to 75—is generally employed for this purpose and perfume and coloring material are added. For some time past it had been conceived that an ideal oil base for brilliantines should consist of white mineral oil of non-volatile characteristics, combined with a mineral oil of volatile characteristics. When using such a combination on the hair, the volatile portion of the mixture would evaporate in a short time, leaving an exceedingly thin and continuous film on the surface, thus eliminating stickiness and greasiness. The volatile characteristics of a hydrocarbon distillate of the type of kerosene would be satisfactory as a volatile ingredient of such oil combination. However, the use of ordinary kerosene was strictly limited because of its strong characteristic odor which cannot be easily concealed. Furthermore, the unsaturated hydrocarbons contained in unrefined kerosene are likely to cause a burning sensation and in many cases more or less acute dermatitis.

With the development of a completely refined kerosene, it is now possible to prepare an oil base along the lines just mentioned. These fully refined hydrocarbon distillates possess all the useful properties of ordinary kerosene, but, apparently, none of its drawbacks. Measuring these oils, which in fact are the lowest viscosity white mineral oils, by U. S. P. standards, the acid test conforms to the U. S. P. specifications although of course they cannot be classified as U. S. P. white mineral oils. The absence of kerosene odor in these completely refined, light hydrocarbon distillates extends their range of usefulness in connection with the manufacture of a large variety of cosmetic products.

Suntan Oils—Another application of white mineral oils is as a carrier in the preparation of so called suntan oils. These preparations are used for protecting the skin against the excessive action of the sun's rays. Such preparations contain an active ingredient which absorbs the actinic rays and so prevents too severe action on the skin. Sometimes, a small percentage of almond oil, castor oil or similar vegetable oil is added to the white oil in order to increase its adhesion.

Non-Drying Characteristics—A small percentage of white mineral oil (up to 4%) has been found helpful in the manufacture of vanishing creams because it tends to prevent the stearic acid from drying out. Incidentally, this same principle is often applied in the manufacture of tooth paste. A small percentage of white oil seems to satisfactorily overcome hardening of the tooth paste in the tubes, particularly those shipped to hot countries.

Allied Cosmetic Uses—White oils are used as softening agents in the manufacture of brushless shaving creams, soaps, nail polish removers and in various other softening preparations. They are used in numerous hair tonics and skin tonic lotions. In all these cosmetic applications and in many others not mentioned here, the inactivity of fully refined white mineral oils to chemical reaction, their freedom from odor and color and their relative stability toward light, heat and aging are among the most important reasons for their usefulness in this industry.

PETROLATUM—ITS COMPOSITION

Petrolatum is closely related to white mineral oil. However, in contrast to white mineral oil, which consists mainly of hydrocarbons liquid at ordinary temperature, petrolatum is composed of solid and liquid hydrocarbons solid at ordinary temperature. There is also a close relationship between petrolatum and paraffin wax, but in contrast to paraffin wax which forms crystalline aggregates petrolatum is amorphous. We can imagine that petrolatum is a colloidal system in which the solid wax is the external phase, and the oil the internal phase. In other words, the wax absorbs the oil just as gelatin does water, causing the formation of a swollen jelly-like mass. This explains the fact that petrolatum in its concentrated form will not leave an oily spot on paper, showing that the wax is the external phase. For a system to form in this manner, and not have

the liquid separate from the solid hydrocarbons in time, a third component is necessary. This substance acts as a gel former and is called proto substance.

This proto substance can be separated from the petrolatum by extraction with acetone. The proto substance is insoluble in acetone and is then separated from the residue by dissolving it in pure Benzol.

Importance of Proto Substance—Proto substance is present in satisfactory quantities in natural petrolatum. However, it is very often removed in the refining process and is not present in synthetic petrolatums. An insufficient amount or a complete lack of proto substance upsets the balance of the solid and liquid components of the petrolatum and, as a result, such petrolatum has a tendency to separate and cause the objectionable "sweating." Therefore, the presence of an ample amount of proto substance in a petrolatum is absolutely essential. In addition, proto substance appears to contribute to the emollient or soothing properties of petrolatum. In order to preserve the proto substance, no drastic methods, such as intense heating or strong chemicals, should be employed in the refining of the petrolatum.

Refining Methods—Petrolatum is obtained only from paraffin base (Pennsylvania) and Midwestern (mixed base) crudes. The reason for this is that the still residue obtained from naphthene base crudes gives an asphalt like material when further refined, from which it is practically impossible to extract any crude petrolatum.

In the refining of the U S P petrolatum, the crude petrolatum is purified by a process technically known as adsorption. This, in principle, consists of bringing the crude petrolatum in contact with very porous materials such as fuller's earth, bone black, etc. The fine pores of the filtering material remove from the crude petrolatum all the impurities which give it color, odor and taste. The more often the purification process is repeated, the lighter will be the color of the petrolatum. Hence, the color range of petrolatum from amber to snow white.

The adsorption process is lengthy and tedious. Sometimes more rapid methods, such as treatment with strong chemicals, are used for refining petrolatum. By such methods, very light colors can be obtained, but it is often done at the sacrifice of the quality of the petrolatum because such chemicals destroy the proto substance present in the natural petrolatum. Such petrolatums in reality are thin liquids held together by an excess of wax.

Variation in Fibre Characteristics—It is often the belief of the pharmaceutical and cosmetic chemist that petrolatum is just petrolatum and that almost any petrolatum will do for a given purpose, as long as the color is about right. However, petrolatum is not such a simply defined product, but one which exists in a variety of different types. There are certain types of petrolatum of excessively long fibre characteristics which tend to make the finished product too sticky or stringy. The type of petrolatum used for most pharmaceutical and cosmetic preparations should be of *medium* but not short fibre. A very short fibre petrolatum is undesirable for most pharmaceutical and cosmetic uses since it is apt to result in a product of thin body, and it also lacks the smooth svelte like consistency of petrolatum of medium fibre characteristics. Shortness of fibre is usually found in synthetic petrolatums and in petrolatum refined by chemical treatment.

In selecting the proper type of petrolatum for a given purpose, two further important properties should be considered, namely, melting point and consistency. These two properties of petrolatum are entirely independent of each other. In other words, a petrolatum can have a high melting point coupled with soft consistency, medium consistency or hard consistency.

Melting Point—While melting point is admittedly a consideration, its importance is often overestimated. The melting point of the finished product should be high enough to preclude its liquefying at summer temperatures. However, there is no additional advantage derived from the use of a petrolatum having a melting point higher than that.

Consistency Tests—Correct and uniform consistency is one of the most important factors in determining the suitability of a petrolatum for a given purpose. The consistency of petrolatum can be determined with an instrument similar to the asphalt penetrometer. The principle of this method, which has been adopted by the American Society for Testing Materials, is to determine the distance a steel cone penetrates under its own weight into the petrolatum. The softer the petrolatum, the deeper will the cone penetrate into it during a given time.

There is a still more sensitive method, the principle of which is to determine the time in seconds it takes for a plunger of lighter weight than that used in the A S T M method, to sink 1 inch into the petrolatum. This method is very accurate, because a very slight variation in con-

sistency of the petrolatum already causes a big difference in the time it takes for the plunger to penetrate 1 inch. Correct and uniform consistency of petrolatum is considered to day one of the most important characteristics of petrolatum.

Petrolatum Classifications—U S P petrolatum can be divided into three distinct types, according to melting point and consistency. Each type can then be subdivided according to color into individual grades.

Type No. 1 includes those petrolatums which have medium melting point and medium consistency. Type No. 2 are petrolatums of low melting point and soft consistency and, finally, Type No. 3 are petrolatums of high melting point and medium consistency.

The petrolatums of medium melting point and medium consistency—type No. 1—are the standard petrolatums of commerce and are used in largest volume. They are best suited for use in pharmaceutical salves, cosmetic creams, hair dressings, etc. Petrolatum of this type has a melting point of about 115–120° F. and is produced in different colors ranging from amber to an almost pure white.

Petrolatum of low melting point and soft consistency—type No. 2—is particularly recommended for repackaging in jars or tubes for resale as petroleum jelly for household use where a soft easy spreading consistency is desirable. It should be employed as the petrolatum base when a large amount of solid ingredients are to be added. This type of petrolatum, however, is not recommended when a large amount of liquid ingredients, such as white mineral oils, are part of the formula. The soft consistency and rapid liquefying properties of this petrolatum (which has a melting point of about 105–110° F.) makes it particularly suitable for salves of all kinds. It is often referred to as collapsible tube grade or ointment grade.

Type No. 3 (which has high melting point and medium consistency) is required only in those cases where the addition of liquids would otherwise reduce the melting point of the finished product to an undesirable degree. The melting point of these petrolatums is in the range of 125–130° F.

There is a fourth type of petrolatum characterized by high melting point and hard consistency. The usefulness of such petrolatum which has a melting point of about 130–135° F. is limited though there are certain applications for it in the cosmetic industry, as for instance, in the preparation of lip and paste rouges, etc. which should not be overlooked.

Selection of Correct Petrolatum Type—In making up any preparation in which the use of petrolatum is desirable or essential, it is necessary to investigate which type of petrolatum is best suited for a given purpose. Only in this way can the fullest benefit be derived from the use of petrolatum.

For example, in the formula for zinc oxide ointment, the Pharmacopœia simply specifies White Petrolatum, which means any U S P petrolatum of a color of lily white or lighter. However the 20% zinc oxide which is to be added to the petrolatum tends to stiffen up the finished ointment. Therefore a petrolatum of soft consistency should be used for this purpose, because it will compensate for the stiffening action of the zinc oxide. As another example in a phenol ointment, which should not be too soft, a petrolatum of medium consistency and medium melting point is the proper type to use. In the Pharmacopœia X, the hardening of an ointment was accomplished by specifying the use of paraffin wax or beeswax, whereas for softening purposes, the addition of white oil was prescribed. This procedure is not ideal. By adding a relatively large amount of paraffin wax or beeswax the structure and appearance of the ointment is unfavorably affected and it will not spread smoothly and evenly whereas the addition of oil may result in separation and sweating."

It is gratifying to note that the U S Pharmacopœia is recognizing the progress made in petrolatum refining by their proposed change of the official ointment formulas in the new Pharmacopœia. When these changes go into effect petrolatum will not only take the place of benzoated lard in all those formulas which still prescribe its use, but the pharmacist will be able to modify a given formula in such a way as to employ the type of petrolatum which requires the least amount of wax for hardening and the least amount of oil for softening. This also will enable the pharmacist to prepare ointments which will not be too soft in warm climates or too hard in cold climates. The empiric system of formulating many pharmaceutical and cosmetic preparations is always wasteful. Trial and error can be avoided once the function of a white mineral oil and petrolatum in a specific formula is understood.

At the close of the speaker's address members in the audience asked several questions regarding the use of kerosene oil in cosmetics and the use of petrolatums. At the close of the discussion a rising vote of thanks was accorded the speaker for his very interesting and instructive talk and the meeting adjourned.

RUDOLPH O HAUCK *Secretary*

PHILADELPHIA

The March meeting of the Philadelphia Branch, AMERICAN PHARMACEUTICAL ASSOCIATION was held at the Philadelphia College of Pharmacy and Science March 12 1935, with Vice President Miller presiding.

The occasion of the evening previous to the meeting, was that of the annual dinner tendered by the members of the branch to its past presidents in honor of their loyalty to the organization.

Before seating the party Vice President Miller requested a period of silence in memory of the former presidents who during the past year answered their last call.

The following past presidents were in attendance, and each was called upon by the chair, for a word of greeting and a few appropriate remarks: W A Pearson, E Fullerton Cook, Ambrose Hunsberger, J W E Harrison, Adley B Nichols, Martin S Dunn, James C Munch, Wm J Stoneback and Frank H Eby. The remarks for the most part dealt with brief historical sketches of the association. After the dinner the members of the branch and guests assembled in the college auditorium for a business session.

The minutes of the last meeting were read and approved.

The treasurer's report was submitted with certificates of audit as rendered by Wm J Stoneback. The report showed a balance of \$155.79 plus a 10% payment from the closed Mutual Saving Company which is placed in a separate saving fund. On motion duly seconded and carried the report was accepted.

The resolution upon the death of William L Cliffe was read, adopted and spread upon the minutes.

Vice-President L L Miller then introduced Dr J W E Harrison as the speaker of the evening. He gave a very interesting and informative lecture on the proposed legislative measures before the Federal government, namely, the Merck and the Copeland bills. Dr Harrison very thoroughly and clearly gave a tabulated summation of the chief similarities and dissimilarities between the two bills and enumerated the complexities of certain phases of each bill. A short discussion followed the address, after which Ambrose Hunsberger presented the following resolution:

TO THE CONGRESS OF THE UNITED STATES

WHEREAS, it has become apparent that in order to afford adequate protection to the consuming public against fraud and deception the Food and Drugs Act now in effect needs to be expanded and strengthened; and

WHEREAS, several bills have been introduced into the Congress which are designed to achieve the above purpose, therefore

Be it resolved by Philadelphia Branch, AMERICAN PHARMACEUTICAL ASSOCIATION in regular meeting assembled that we endorse any legislation which provides adequate protection against the distribution of substandard or adulterated Foods and Drugs, and

Be it further resolved, that such legislation should provide methods for preventing and exploitation of Foods, Drugs and Cosmetics by false misleading, and deceptive advertising in whatever form, and

Be it further resolved that such legislation should require statements on the labels of containers setting forth the identity and percentage of the potent ingredients contained therein, and

Be it further resolved, that enforcement of the foregoing and all other provisions of Food and Drug Control enactments should be placed under the jurisdiction of the Food and Drug Administration in the Department of Agriculture.

Respectfully submitted,

Philadelphia Branch, AMERICAN PHARMACEUTICAL ASSOCIATION

E H MacLaughlin, *President*

G E Byers *Secretary*

Said resolution to be placed on our records and a copy mailed to the proper authorities for delivery to the Federal Committee on said bills Motion was seconded, accepted and so ordered

A rising vote of thanks was then given to Dr Harrison for his timely lecture

Chairman James C Munch, of the Nominating Committee, reported a list of officers for the coming year The nominees were duly elected, they are *President*, Edmund H MacLaughlin, *First Vice President* L L Miller, *Second Vice President*, John N Woodside, *Secretary Treasurer*, George E Byers, *Delegate to the House of Delegates* Ambrose Hunsberger

GEORGE E BYERS, *Secretary*

STUDENT BRANCH OF ST JOHN'S UNIVERSITY COLLEGE OF PHARMACY

The regular meeting of the Student Branch of St John's University College of Pharmacy, A PH A, was held January 28th, President Arancio presiding The minutes of the previous meeting were read and approved The several committees presented their reports Chairman Matz, of the Committee on Program presented Mr Bellafiore the first speaker for the evening who discussed "The Pharmaceutical Possibilities of Dental Supplies," taking as a source for his material an article published in the last issue of the JOURNAL A PH A He recalled the coöperation between doctor and pharmacist of some years ago when pharmacists detailed doctors with suitable official preparations which the doctors subsequently prescribed

This was to their mutual benefit, he said, the doctor being assured of therapeutically active medicines and the pharmacist in being able to dispense standard non proprietary preparations The dentist who to day buys proprietaries through dental supply houses is often lured into using harmful products or products which masquerade under meaningless descriptive terms and whose true worth cannot be determined The pharmacist can not only protect him from these impositions but can replace these items with official products at lower prices " Mr Bellafiore concluded by mentioning several official substances that can be offered to the dentist among them were Mercury, Tincture of Iodine, Eugenol Liquefied Phenol and Compound Dental Liniment of Aconite

The next speaker was introduced by Professor Corcoran as Charles Harland Simpson, Jr, official representative of the United States Public Health Service His subject was Pharmacy in Public Health Service " Mr Simpson outlined to an interested audience the growth of the service from 1798 when it was first established as a hospital for the care of seamen to its present indispensable activities in safeguarding the health of the nation

To day the Service consists of seven divisions headed by the Surgeon-General of the Public Health Service who is in turn under the jurisdiction of the Secretary of the Treasury The names themselves indicate the functions of the various divisions Division of Research Marine Hospitals, Mental Hygiene, Venereal Disease, Domestic Quarantine Reports and Vital Statistics Foreign and Insular Quarantine "

"Modern means of transportation " Mr Simpson pointed out "both inter-state and international can spread disease so rapidly that rigid inspection and quarantine are absolutely essential For example some one who had contracted a disease in some South American port would develop the symptoms of the disease in the two weeks on ship board whereas to day he is deposited in our country by plane in a few days before the disease has had time to make its appearance Then again trains carrying milk, water passengers, etc within our borders have to be watched To control these modern conditions the Division of Reports and Vital Statistics has available the condition of health of cities states and nations so that inspectors know whence to expect disease

"The service is quick to investigate health problems For example, its Research Division discovered the poisonous properties of knockless gasoline and prevented its use as a dry cleaner It traced to oysters grown in unsanitary beds an outbreak of typhoid in Chicago and caused legislation to be passed that oysters may be grown only in inspected beds Its work eradicated amœbic dysentery and encephalitis almost completely

"In 1929 Narcotic Farms were established where drug addicts are sent for a cure which consists largely of gradual withdrawal of the drug and instruction in personal hygiene This led to the formation of the Division of Mental Hygiene which in addition cares for morons and Federal prisoners

"Lepers are sometimes discovered in this country Without publicity these are withdrawn to hospitals where they are treated The Service provides standards for biologicals and vaccines It inspects immigrants It controls the proper neutralization of arsphenamine

"Pharmacists perform an important part of this work After a preliminary training they are named administrative heads of Marine Hospitals, direct crews in fumigating ships from diseased ports to kill rats or act in their professional capacity They are admitted to the service only with a B S in Pharmacy degree after passing written and oral examinations in academic, business and professional subjects

"The Service is the first part of our Government to recognize the pharmacist with a Commission Pharmacists will act as administrative coordinators throughout the country in the proposed social security program "

At the conclusion of his talk Mr Simpson was given a vote of thanks

ADA J BIZZARRI, *Secretary*

PROGRAM

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE *

PROGRAM—SECTION N (MEDICAL SCIENCES) SECTION N3 (PHARMACY)

Thursday, June 27, 1935 10 00 A M to 12 30 P M ¹

John C Krantz, Jr, Councilor—to the American Association for the Advancement of Science from the AMERICAN PHARMACEUTICAL ASSOCIATION—Presiding

Gustav Bachman Councilor—to the American Association for the Advancement of Science from the AMERICAN PHARMACEUTICAL ASSOCIATION—Local Secretary

The assignments are 15 minutes for each presentation

1 "Studies on the Penetration of Antiseptics in Living Tissues " By Arthur D Hirschfelder and Milan Novak, Department of Pharmacology, School of Medicine, University of Minnesota

2 "A Study of *Cracca Virginiana* L " By Lawrence F Madland and Arthur H Uhl Department of Pharmaceutical Chemistry, University of Wisconsin

3 Colloidal Properties of the Arsphenamines in Relation to Toxicity and Therapeutic Efficiency " By Harold N Wright, Department of Pharmacology, School of Medicine, University of Minnesota

4 "The Fate of the Sugar Alcohols and Their Anhydrides in the Animal Body " By John C Krantz, Jr, C Jelleff Carr and Ruth C Musser, Department of Pharmacology, School of Medicine, University of Maryland

5 "The Application of the Shaffer Smogyi Method in the Study of the Deterioration Rate of Tincture of Digitalis and a Physical and Pharmacological Investigation of the Absorption of Glucosidal Complexes Present in Tincture of Digitalis " By Earl B Fischer, R A Gortner and Charles E Rogers, Department of Pharmacy and Biochemistry, University of Minnesota

6 "The Microscopy of Powdered Desiccated Endocrine Glands " By Heber W Youngken, Department of Pharmacognosy Massachusetts College of Pharmacy

7 "A Physicochemical and Pharmaceutical Contribution to the Solubility of Boric Acid in Water " By George Grossen and Gustav Bachman, Department of Dispensing College of Pharmacy, University of Minnesota

8 "The Effect of Certain Sugar Alcohols and Their Anhydrides in the Disassociation Constant of Boric Acid " By Margaret Oakley, C Jelleff Carr and John C Krantz, Jr, Bureau of Chemistry, State of Maryland Department of Health, and Department of Pharmacology, School of Medicine, University of Maryland

* Minneapolis, Minnesota

¹ Meeting Room to be announced later

ASSOCIATION BUSINESS

AD INTERIM BUSINESS OF THE COUNCIL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, 1934-1935

Office of the Secretary, 2215 Constitution Avenue, Washington, D C

LETTER NO 13

February 4 1935

To the Members of the Council

71 Meeting of the Executive Committee

Upon the call of Chairman Hilton a meeting of the Executive Committee of the Council was held at 2215 Constitution Avenue, Washington D C, on Saturday January 5 1935 to consider the following matters and any other business that should properly come before the Executive Committee

Report of the Special Committee to confer with a Special Committee from the N A R D

Relation of the A Ph A to the National Drug Trade Conference

Report of the Committee on Maintenance

Report of the Committee on Publication—National Formulary Recipe Book, Pharmaceutical Abstracts

Representation of the A Ph A on the National Retail Drug Code Authority

The minutes of the meeting are as follows

The meeting was called to order by the Chairman at 10 20 A M with the following members present Arny, DuMez, Dunning Eberle Fischelis Hilton, Holton, Kelly LaWall and Philip Chairman Hilton stated that J H Beal as vice chairman of the Council and R L Swain as a member of the A Ph A - N A R D Joint Committee had been invited to attend the meeting—Dr Swain was present at both sessions and Dr Beal attended the afternoon session

Messrs Fischelis, Swain and Kelly submitted a verbal report as the A Ph A representatives on the A Ph A N A R D Joint Committee and the following minutes of the first meeting of the Joint Committee and requested that they be given any instructions thought advisable with respect to the several subjects under consideration by the Joint Committee

The first meeting of the Joint Committee representing the A Ph A and the N A R D was held at the Hotel Washington Washington, D C on Wednesday December 5 1934 beginning at 8 15 P M The meeting was postponed from Tuesday December 4, 1934, be-

cause Mr Dargavel found it impossible to be present

All members of the Joint Committee were present Charles Ehlers, John W Dargavel, Thomas S Smith for the N A R D, and Robert P Fischelis Robert L Swain and E F Kelly for the A Ph A

By agreement Robert P Fischelis acted as chairman and E F Kelly as secretary

After an interchange of greetings the Joint Committee proceeded to a consideration of the matters referred to it by the annual meeting of the Council A Ph A and the Executive Committee N A R D

After a lengthy discussion of the relations between the two Associations and between them and the State Pharmaceutical Associations, during which particular attention was given to the membership of the three groups, to the formation of Conferences of State Associations, and to the necessity for unifying the forces of the three groups, and providing for the effective representation of pharmacists, it was unanimously agreed

1 That the proposal to consolidate the A Ph A and the N A R D was disposed of for the present by a formal resolution adopted by the N A R D at its recent meeting in New Orleans

2 That although the proposal for some form of affiliation between the two Associations did not appear to be practical under the existing conditions and in view of the apparent need for separate organizations to deal with the professional and economic problems of pharmacy, an effective plan of coöperation should be worked out

3 That some practical plan of federating the State associations with the A Ph A and the N A R D more closely than is now the case is necessary

4 That the Committee favors the further consideration of the suggestion that a plan be worked out for federating the State associations with both national associations by providing that members of each State association become automatically members of the national associations on a single membership fee plan

Arrangements were made for a meeting of the Joint Committee early in January, pref-

crably on the 8th, to further develop the plan to which representatives from the Conference of Pharmaceutical Association Secretaries, representing the State associations, will be invited

With respect to Pharmacy Week it was agreed

1 That the A P H A should take the leadership and should appoint the Committee on Pharmacy Week including several representative members of the N A R D

2 That the two Associations should award a joint certificate to the ten best window displays after the first award

3 That the annual appropriations of \$250.00 each from the A P H A and N A R D be continued and increased as rapidly as possible

4 That as many carefully selected advertisers as possible be requested to give a definite time for Pharmacy Week on the radio and to provide them with a program

After a general discussion of U S P and N F Publicity, it was the sense of the Committee that the A P H A should direct this effort and that it should collect information about the work being done in the various States and work out a standard plan for promoting the use of official preparations.

It was agreed that First Aid Week should be directed by the N A R D, and that the A P H A should assist in so far as possible

The meeting adjourned at 11:00 P M to meet at 10:00 A M on December 6th, with the understanding that the chairman and secretary would prepare for consideration at that time, a statement to be sent to the pharmaceutical press

The meeting reconvened at 10:00 A M on December 6th, with all members present except R L Swain

After several changes were made, it was agreed that the statement, of which a copy is attached, should be issued by the secretaries of the two Associations

The meeting then adjourned

The forenoon session was devoted to a discussion of federation and of joint membership in the A P H A, the N A R D, and the State associations on a single membership fee or otherwise. A letter that Dr Dunning had addressed to the secretary, on this subject, was read and it was requested that a copy of it be sent, with these minutes, to each member of the Council. President Fischelis explained his plan for federation and joint membership

on a single membership fee and stated that this plan would be given in his address to be delivered at the testimonial dinner to him in New York on January 10th

After all present had expressed their views, it was agreed that the representatives of the A P H A should attend succeeding meetings of the Joint Committee with an open mind on the subject and should cooperate in the investigation and consideration of any proposed plan for federation on a single membership fee or otherwise for submission to the respective associations

Adjournment was taken at 1:00 P M for lunch and the afternoon session was called to order at 2:10 P M

72 *Committee on Maintenance* Chairman Dunning submitted a verbal report that the sum of \$109,568.00 has been subscribed to the Maintenance Fund of which \$61,707.00 had been paid. Of this total \$50,000.00 was in the form of a bequest by will. The subscriptions to this fund were being segregated from those to the Headquarters Building Fund with the exception of one cash subscription of \$50,000.00 the donor of which had specified that it might be used for paying off any indebtedness on the building and equipment. All indebtedness including the note for \$40,000.00 with the Maryland Trust Company has been paid leaving the project entirely free of debt excepting a balance of \$1000.00 due on the planting, and with a cash balance of about \$10,000.00. The mortgage of \$36,400.00 on Lot No. 7, which Lot the Association had found it necessary to buy in order to secure Lots Nos. 12, 13, 14 and 15 from the George Washington University, could be continued at 5½% or might be refinanced for an indefinite period at 4½%. This mortgage was amply protected by the bequest referred to above.

Chairman Dunning said that the work of his Committee would be continued as opportunity presented and requested assistance in securing funds for special purposes such as the library, museum, etc., and for special services that could be carried on in the building.

In reference to the exemption from taxation Dr Hilton reported that although final action had not been taken by the Board of Commissioners due to the recent change in administration, he had been assured that the matter would have attention at an early date.

Chairman Dunning reported that he and the secretary had given consideration to the suggestion made at the meeting of the Executive

Committee on July 17th, that special committees be provided to cooperate in connection with the Library and the Museum. As the Council was charged with the custody of the property, funds and publications of the ASSOCIATION, it appeared to be the duty of the Council to select these committees and to decide on their duties. After a general discussion it was moved by Kelly that a special Committee on Library and a special Committee on Museum be created by the Council, membership not to be limited to the Council and to be selected with special reference to their knowledge and experience, to study the development of the library and museum, respectively, and to submit plans with respect to each. The motion was seconded by Holton and carried. It was moved by Army that the members of these Committees should be chosen by nomination and vote of the Council. The motion was seconded by Fischelis and carried.

On motion of Holton-Army, the report of the Committee on Maintenance was received with thanks to Chairman Dunning for his services.

73 Committee on Endowment Chairman Beal reported that he had contributed \$1000.00 to this fund in 4% bonds, that the bonds would be delivered at an early date and that efforts would now be made to further increase this fund. The report was received on motion of Holton-Kelly, with thanks to Dr. Beal for his contribution.

74 Relation of the A. Ph. A. to the National Drug Trade Conference Referring to recent discussion of this subject, Dr. Beal who was at that time general secretary of the ASSOCIATION, reviewed the actions leading to the establishment of the Conference and to the purposes which it was intended to serve. It was not expected that there would be unanimity of opinion or of action with respect to all matters brought before the Conference but that there would be friendly consideration of them and coöperation on those which were found to be of mutual interest. Although there had been criticism of the Conference and of its work, he felt that it had served and could serve a useful purpose in providing a meeting ground for the member associations, representing every division of pharmacy and the drug trade as had been intended by the A. Ph. A. in proposing the Conference.

A lengthy discussion followed with particular reference to the last annual meeting of the

Conference and the position of the A. Ph. A. on matters which the Conference was now dealing with, notably Food and Drug Legislation. No action was considered to be necessary.

75 Committee on Publications Chairman DuMez said that the Committee was now faced with several questions which could not be satisfactorily considered and decided by correspondence.

With respect to the *National Formulary, VI*, the work of revision was nearing completion, the contract for printing and binding has been awarded and page proofs were now being distributed. Recommendations had been made by his Committee to the Council that invitations for bids on the distribution and sale of the N. F. VI be issued to a selected list of firms under specifications and proposal as submitted and that the retail selling price be set at \$5.00 per copy in buckram and at \$7.00 per copy in leather (see Council Letter No. 8, pages 1245 and 1246). Although these recommendations had received the approval of a majority of the members of the Council, some objection had been voiced to the proposed price of \$5.00 for the N. F. VI in buckram. The reasons for the suggested increase had been given in Council Letter No. 8, and were reviewed.

After a full discussion of the question, the vote on Motion No. 12 by which the retail selling price of the N. F. VI was set at \$5.00 per copy in buckram and at \$7.00 per copy in leather and the retail selling price of the *Pharmaceutical Recipe Book* was set at \$5.00 per copy in buckram was confirmed, on motion of Philip Holton. Dr. Fischelis asked to be recorded as voting "No" on the price of the N. F. VI in buckram.

With respect to the *Pharmaceutical Recipe Book*, Chairman DuMez reviewed the progress of the revision and explained the difficulties that were being met with and the steps being taken to deal with them. It was not intended to issue the second edition until after the appearance of the U. S. P. XI and the N. F. VI. The contract for printing and binding R. B. II had not been let as it is not yet known how many of the present plates can be used again. The arrangements that had been made with Mrs. Kassner to act as Editor of the second edition were also explained. Mrs. Kassner had undertaken to complete the work under the direction of Chairman Lascoff as far as possible before her return to England late in February and to attend to the remainder by

correspondence and desired to leave the matter of payment for decision after the work was done

Chairman DuMez stated that at a conference with Chairman Lascoff and Secretary Kelly, it had been decided that a meeting of the full Committee on Recipe Book would not be required but that a meeting of certain members would be necessary later. It was believed that the expenses of this meeting and other incidental expenses would be covered by the present appropriation of \$500 00 in the budget and that \$500 00 should be added to the appropriation to cover the cost of editing. On motion of DuMez Arny, \$500 00 was added to appropriation for the *Recipe Book* in the 1935 budget.

With respect to the *Publication of Changes in the N F VI* Chairman DuMez submitted parts of the report covering the changes as prepared by Chairman Gathercoal and explained the estimated cost of publishing the entire report. After a general discussion it was moved by Philip that while greatly appreciating the fine work done in preparing the abstracts of the proposed changes in the N F VI, the Council believes that in the present financial condition of the ASSOCIATION the large expense that will be necessary in printing these changes and the small amount of space available in the JOURNAL, makes the publication impractical at this time. The motion was seconded by Arny and carried.

With respect to the *Publication of Abstracts in the A Ph A Journal* Chairman DuMez reviewed the recommendations made by the Special Committee on YEAR BOOK in 1933 and which were referred to the Committee on Publications for action and stated that the latter committee was arranging to publish the abstracts for 1935 in the JOURNAL beginning with the March issue. They would be printed in forms of 32 pages separately numbered and following "Editorial Notes" in order that these pages could be removed for separate binding if desired. The ASSOCIATION data and roster of members can be printed in one issue of the JOURNAL and it is planned to have several hundred of the YEAR BOOKS bound in the present style for sale to libraries and others interested in continuing the series. This would provide a total of 384 pages per year for abstracts which approximates the number of pages used in the YEAR BOOK. It is proposed to pay the abstractors at the rate of \$2 00 per page in English and \$3 00 per page for other

languages. On motion of LaWall Arny the Committee was authorized to proceed with the publication of abstracts in the JOURNAL on the plan proposed.

Following the meeting of the Executive Committee Chairman DuMez wrote that in order to have a complete record, he would submit the plan for publication of the abstracts, as outlined on page 45, to the members of the Committee on Publications and has advised that the following has been approved by the Committee.

Several years ago the Council of the A Ph A appointed a Special Committee on YEAR BOOK at my request, to make recommendations with respect to the nature and number of articles to be abstracted and with respect to the future disposition of these abstracts. There has been a demand which has become more and more urgent in recent years that these abstracts be made available to the members much sooner than they have been in the past.

This Special Committee made a careful study of the situation and rendered a written report to the Council on two consecutive years. The second report made certain definite recommendations among which was that the abstracts should be published monthly in the JOURNAL. The Council approved this recommendation and authorized the Publication Committee to put it into effect just as soon as the affairs of the ASSOCIATION would permit. We are now ready to carry out these recommendations and the essential details of the plans which have been made for doing so and which are now submitted to you for approval are as follows:

1 The abstracts will be carried as a section in our JOURNAL immediately following the editorial notices and preceding the advertising section. The pages of this section will be numbered separately so that they can be taken out from the other material, combined with the ASSOCIATION data and the indices to make what would be essentially the YEAR BOOK as we now know it.

"2 In making the new contract for the publishing of the JOURNAL a provision was made to include a 16 page form in each number of the JOURNAL or 32 pages on which to carry these abstracts. This will give us a total of 384 pages or approximately the same number of pages as has been devoted to this purpose in the YEAR BOOK.

'3 It is planned to set a definite rate of compensation for the preparation of abstracts. This has been set at \$2 00 per printed page for abstracts prepared from publications in the English language, and \$3 00 per printed page for abstracts prepared from articles published in other languages. The rate is about the same as that which has been paid for abstracting in the past where it was found necessary to pay anything at all for this service.

'4 I am informed by the Lord Baltimore Press, the company which has the contract for publishing the 1933 volume of the YEAR BOOK, that the new arrangement will effect a saving in publication of approximately \$600 00 to \$700 00. I doubt, however, if the ASSOCIATION will gain to this extent, as the new arrangement will very likely bring new expenses that have not been anticipated.

' Please let me have your vote on this matter promptly as we have no time to waste if the first abstracts are to appear in the March number of the JOURNAL."

With respect to the YEAR BOOK, Chairman DuMez stated that Volume 22, for 1933, is being printed and that the copy for Volume 23, for 1934, will not be completed for about six months. It had been recommended to hold Volume 22 until Volume 23 is completed and issue them in one binding but it was felt that the delay would bring criticism.

After discussion and on motion of Arny-LaWall the Committee was authorized to proceed with the publication of Volume 22 of the YEAR BOOK.

Messrs Dunning, Fischelis and Holton requested to be excused at this time as they had to leave the meeting.

76 *Representation of the A Ph A on the National Retail Drug Code Authority.* The Chairman stated that this subject had been included in the program to provide an opportunity for a full consideration of it.

The Secretary reported that a letter had been received from NRA since the last meeting of the Executive Committee, outlining certain necessary changes in the By-Laws of the ASSOCIATION respecting membership if the ASSOCIATION is to be permanently represented on the National Retail Drug Code Authority and that NRA had been advised that the ASSOCIATION would not meet until August 1935 when the proposed changes would be considered. In the meantime the secretary continued to serve as temporary representative

of the A Ph A on the Code Authority and as its secretary-treasurer.

Referring to the discussion of the subject at the meeting of the Executive Committee on July 17th, the secretary stated that he had believed it necessary to continue his additional work on the Code until the Loss Limitation provision and the Budget of the Code Authority could be settled, which had been delayed much longer than had been expected. Decision on the former question had been reached on September 21st, and on the latter on December 13th. At the December meeting of the Code Authority, he had therefore requested to be relieved of the work additional to membership on the Code Authority, through the employment of an accountant to take charge of the budgets, which was done promptly, and by the selection of some one to take full charge of the work of the Code Authority which will be done as soon as possible.

The Secretary estimated that at certain periods the Code work had taken up as much as one-third of his time, much of which, however, could be made up and stated the amount of salary which the Code Authority had paid him on account of the additional work, all of which salary payments had been deducted from his salary from the A Ph A.

It was the general opinion that the secretary should be relieved of this additional work as promptly as satisfactory arrangements can be made and it was understood that the secretary will advise the Council of these arrangements as soon as they can be completed.

No action was taken by the Committee.

NOTE The members of the Council have been furnished with further details in this connection through copies of correspondence between the president and the secretary.

On motion of LaWall Philip the meeting adjourned at 7 20 P M.

(Motion No 27) *It is moved by Kelly that the Minutes of the Executive Committee as presented herewith be approved by the Council and that the actions of the Executive Committee be come the actions of the Council.*

A vote on this motion will be called for in about ten days.

The Secretary is now prepared to report that Mr W S Elkins of Decatur, Georgia, was elected as Executive Secretary of the National

Retail Drug Code Authority and took up his duties on March 15, 1935. Mr. Elkins will have charge of the office of the Code Authority and of its administration.

The Secretary will continue as a member of

the Code Authority, representing the A. P. H. A. until further action of the Council and as secretary-treasurer of the Code Authority and will act in an advisory capacity.

E. F. KELLY, Secretary

COMMITTEE REPORTS

REPORT OF COMMITTEE ON WEIGHTS AND MEASURES

It was the thought of President R. L. Swain and others that the work of this Committee should be coordinated very closely with that of the Committee on Prescription Tolerances. It is recognized that the accuracy of prescription compounding depends in no small measure on the accuracy displayed in weighing and measuring quantities of ingredients. Unless balances, scales, weights, graduates and other weighing and measuring devices are accurate, it is impossible to provide accurate compounding and dispensing.

In order to determine the present status and accuracy of the weighing and measuring devices in the pharmacies throughout the United States, it was decided to address the Department of Weights and Measures of each state and ask for information as to what supervision is exercised by the state over weighing and measuring devices in retail drug stores. These departments were also requested to supply copies of their annual reports and any information which they might have in their possession bearing upon the questions in which the Committee is interested.

As a result of communications addressed to the 48 states on this subject, a variety of replies was received, consisting in most instances of copies of laws and regulations and in a few instances of reports and comments.

It appears that the economic wave which has overtaken state activities, has resulted in a curtailment of the publication of reports by various departments.

No replies of any kind were received from the States of Alabama, Colorado, Idaho, Illinois, North Carolina, Rhode Island and Washington, although several follow-up letters were sent.

The following states indicated that drug store weighing and measuring devices are in a satisfactory condition: California, Florida, Georgia, Nevada, Oregon, South Carolina and Utah.

The following states have no Departments of Weights and Measures: Louisiana, Mississippi and Missouri.

In Oklahoma, the activities of the Weights and Measures Department are handled by the State University.

In New Jersey, the Department of Weights and Measures reported as follows:

"For the fiscal year ending June 30, 1933, 513 prescription scales were examined, of which 472 were found accurate, 32 required adjustment and 9 were condemned.

'Four thousand fifty-seven (4057) metric weights were examined, of which 3804 were found accurate, 185 required adjustment and 68 were condemned.

"Two hundred and seventy-one (271) troy weights were examined, of which 236 were found to be accurate, 21 required adjustment and 14 were condemned.

"Eight thousand four hundred and eighty-eight (8488) apothecary weights were examined, of which 6943 were found accurate, 539 required adjustment and 966 were condemned.

Three thousand one hundred and forty-six (3146) glass graduates were examined, of which 3020 were found accurate and 126 were condemned."

In the State of Wisconsin for the fiscal year ending June 30, 1932, seven hundred and thirty-five (735) prescription weights were examined, of which 19 were adjusted, 23 condemned for repairs and one condemned.

In the District of Columbia for the year ending June 30, 1933, four hundred and forty-one (441) prescription scales were examined and tested. Of these, 412 were approved with adjustment, 44 were tested and 27 were condemned for repairs and one was confiscated.

For the same period, 7965 prescription weights were tested, of which 7754 were approved and 211 were confiscated.

The following comment of the Superintendent of Weights, Measures and Markets of the District of Columbia on the situation in the District is pertinent "When this department began testing prescription scales and weights several years ago many of them were found in very bad condition, but, due largely to the annual inspections made conditions with regard to such scales and weights have greatly improved"

We all know that if inspections are made in any field of activity conditions are good. When no inspections are made, conditions are apt to be bad because of the carelessness which results from the knowledge that no one is checking up or policing a given situation.

It is a well-known fact that the quality of drugs and medicines dispensed improves when there is knowledge that the products are subject to inspection and test. The same holds true for weights and measures or any other activity.

The Chairman of your Committee feels that a general survey of reports of state county and municipal departments of weights and measures should be made to determine, so far as possible, the conditions of weights and measures in the pharmacies of the United States. When this survey has been completed an effort should be made to call to the attention of the pharmacists of the United States such facts and figures as may be developed, and recommendations should be offered to improve the situation, if necessary. Our report this year is therefore in the nature of a progress report, and it is suggested that the incoming committee continue the work that has been undertaken endeavoring to provide as complete a survey as possible of the situation in the near future.

(Signed)

ROBERT P. FISCHER, *Chairman*
W. MAC CHILDS H. W. PARKER
ROWLAND JONES C. S. PIERCE

STATE PHARMACEUTICAL ASSOCIATION MEETINGS

APRIL

Georgia, 22-23, Albany
Kansas, 9-11, Wichita
Missouri, 23-25, Kansas City
Oklahoma, 16-18, Tulsa

MAY

Florida, 14-16, Jacksonville
Illinois, 21-23, Quincy
New Mexico, 22-23, Clovis
North Carolina, 13-15, Winston-Salem
South Carolina, 8-9, Spartanburg

JUNE

Alabama, 18-20, Birmingham
Arkansas, 11-13, Jonesboro
California, 23-26, San Diego
Colorado, 18-20, Estes Park
Connecticut, 27-28, New London
Indiana, 18-20, Lake Wawasee
Kentucky, 18-20, Crab Orchard
Maine, 26-28, Rangeley
Massachusetts, 17-19, Swampscott
Michigan, 18-20, Grand Rapids
Mississippi, 17-19, Tupelo
New Hampshire, 23-26, Dixville Notch
New Jersey, 19-21, Atlantic City
New York, 18-21, Lake George

North Dakota, 11-13, Fargo
Pennsylvania, 17-21, Cruise on Lake Erie
Rhode Island, Watch Hill
Texas, 3-6, Dallas
Utah, Salt Lake City
Vermont, 16-18, Fairlee
West Virginia, 17-18, Parkersburg
Wisconsin, 25-27, Green Bay
Wyoming, 24-25, Casper

JULY

Montana, 5, Anaconda
Ohio, 16-19, Cedar Point
Tennessee, 15-18, Memphis

AUGUST

Idaho, 4-6, Portland
Oregon, 4-6, Portland
Washington, 4-6, Portland

DEATH OF MRS. F. C. GODBOLD

Mrs. Elizabeth Godbold, widow of our late member, F. C. Godbold, New Orleans, died at the home of her brother, Dr. H. V. Army, Montclair, N. J., April 9th, aged 77 years.

EDITORIAL NOTES

REPORTS OF THE INTERNATIONAL CONGRESS OF MILITARY MEDICINE AND PHARMACY

Through the courtesy of Major General H L Gilchrist, editor of the *Military Surgeon*, the Library of the AMERICAN PHARMACEUTICAL ASSOCIATION has received reports on the Congress of Military Medicine and Pharmacy for 1923, 1925, 1927, 1929, 1931 and 1933. All of the foregoing reports were made by William Seaman Bainbridge, Captain M C F, United States Naval Reserve. These meetings were held consecutively, in the order given above, in Rome, Paris, Warsaw, London, The Hague and Madrid.

On behalf of the ASSOCIATION thanks are extended to those whose names are mentioned herewith.

S L HILTON, REMINGTON MEDALLIST

Announcement has been made by Secretary Dr Hugo H Schaefer, of the election of S L Hilton to receive the Remington Honor Medal for 1935. He is chairman of the Council and a former president of the A P H A and treasurer of the Pharmacopœial Convention.



S L HILTON

During the erection of the American Institute of Pharmacy, Dr Hilton made a daily visit to the site and was helpful in many ways.

prior to the construction of the headquarters. Further reference to the recipient of the award will be made in due time.

DEAN C B JORDAN HONORED

At the close of the banquet and program of the Fifth Annual Druggists Business Conference, recognition of Dean Jordan's twenty-five years of distinctive service as the Dean of Purdue University, School of Pharmacy, was made a special feature. The members of the faculty of Pharmacy presented Dean Jordan with a handsome illuminated parchment. The program was under the direction of President E C Elliott.

Tributes were made in short addresses by President Robert P Fischelis of the AMERICAN PHARMACEUTICAL ASSOCIATION, F V McCullough, secretary of the Indiana Pharmaceutical Association, President E A O Harrow, of the Indiana Board of Pharmacy, and J K Lilly.

THE TWELFTH INTERNATIONAL PHARMACEUTICAL CONGRESS

Among the subjects that will be considered at the Twelfth International Congress are the following: The medico pharmaceutical scope, the limitation of pharmacies, pharmaceutical regulations—control of patent medicines and prices to be charged, management of pharmacies, pharmaceutical service in social insurance, the question of employment in pharmacies, pharmaceutical terms.

INTERNATIONAL CONGRESS OF HOSPITALS

The Fourth International Congress of Hospitals will be held in Rome, May 19-26, 1935. An elaborate program has been prepared and reduced rates will be effective. The Secretary General is Dr Edoardo Licorio, Ospedale S Spirito, Rome.

IDAHO ENLARGES PLANT GARDEN

Drug plants from many parts of the world are now being grown in the greenhouse of the campus of the University of Idaho, southern branch. This extensive plant cultivation was made possible by the Government's F E R A funds for employing undergraduate pharmacists to care for the garden.

The purpose of the experiment, according to Prof E O Leonard, director of the division of pharmacy, is to determine the possibilities of increasing the medicinal content of drug plants.

PERSONAL AND NEWS ITEMS

The address of President Robert P Fischelis, of the AMERICAN PHARMACEUTICAL ASSOCIATION—before the Third Annual Pharmaceutical Conference of the College of Pharmacy, of the University of Michigan—was published in *Science* of March 29th

Dr Charles R Mann as director for 12 years of the American Council on Education is to be honored on May 3rd by that organization This will be the 18th annual meeting and the general topic, "Unoccupied Areas in Education" The speakers will be Sidney B Hall Richmond, Rev George Johnson, of Catholic University, John G Bowman, University of Pittsburgh, Harold G Campbell, New York City, William F Ogburn, University of Chicago, A S Pratt, W W Charters and Fred B Robinson, College of the City of New York

It is contemplated to build a new Naval Hospital in Washington, located on the site of the present Naval Medical Center at 23rd Street and Constitution Ave The new facilities would include space for the Medical School and the Naval Dispensary, in addition to the regular hospital building The site is immediately opposite to the AMERICAN INSTITUTE OF PHARMACY

Adolph S Ochs, publisher of *New York Times*, died April 9th His remarkable record and influence as a publisher commanded attention and respect, for to a very large extent the insistence of factual accuracy as a basic standard of reputable journalism in the United States was due him All publications and the readers owe him a debt of gratitude

Harry L Schrader, Baltimore, has donated a letter of H P Hynson accepting membership in the Wedgewood Club and thanking the father of Mr Schrader for his interest, a number of the *Druggists Circular*, October 1874 The latter contains a report of the Louisville meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION, John F Hancock president Among other items is a National Formulary of 1838 belonging to A P Sharp, also a number of bottles of fluidextracts and granules a glass mortar sign and a set of troy weights—16 ounces to 1½ ounce

Ambrose Hunsberger, Jr, son of our fellow-member has been placed in charge as chief of the research division of John Wyeth & Bro Mr Hunsberger attended Philadelphia College of Pharmacy and Science, is a graduate of Princeton University, and continued graduate

work at the University of Pennsylvania Recently, he has been on the staff of the Biochemical Department of Philadelphia General Hospital

Dean D B R. Johnson was honored by members of the faculty and friends on April 5th, in commemoration of his fifteen years of deanship of Oklahoma School of Pharmacy Herman Jones was chairman of the committee on invitations Prof Ralph Bienfang has been active in the arrangement and President Clyde Miller has appointed a committee on the memorial

John P Jelinek, prominent St Paul retail pharmacist, was injured severely when struck by an automobile After Mr Jelinek had recovered sufficiently to be taken home from the hospital, Mrs Jelinek suffered a fall resulting in a severe leg injury Both, however, are recovering rapidly

Dr F E Stewart and Warren H Poley were the honored guests at the annual Founders Day of the Philadelphia College of Pharmacy and Science Dr Stewart graduated in 1876 and Mr Poley in 1875 Dr F E Stewart was for many years chairman of the Committee on Patents and Trade Marks of the AMERICAN PHARMACEUTICAL ASSOCIATION and in many other ways contributed valuable work to the ASSOCIATION and in the establishment of the Council on Pharmacy and Chemistry

James E Hancock, chairman of the Procter Memorial Fund Committee, is heading the movement to have the Frigate Constellation reconditioned and brought to Fort McHenry and become part of the Museum being established at the Fort, in the restoration of which Mr Hancock has been very active in fact the leader This is now a National shrine and the active part which Baltimore had during the history of the Constellation suggests its location here

Dr A R Bliss, Jr, dean of the School of Pharmacy of Howard College at Birmingham, Ala, will read a paper before the International Physiological Congress in Leningrad and Moscow in August 1935 Dr and Mrs Bliss will be members of a group of physicians headed by Dr J S McLester, *President-Elect* of the American Medical Association and Dr A J Carlson of the University of Chicago, they leave Chicago on their journey July 25th

Dr Paul N Leech was the speaker at the meeting of Chicago Branch A Ph A, April

16th, on the subject "Some Topics of Interest to the Pharmacist and Physician"

Dean Ernest Little, of the Rutgers University College of Pharmacy, will be honored at a testimonial dinner here on May 20th, in recognition of his service to pharmacy as president of the American Association of Colleges of Pharmacy

The dinner, to be held at the Hotel Robert Treat, is being sponsored by the Northern New Jersey branch of the AMERICAN PHARMACEUTICAL ASSOCIATION and the Alumni Association of the Rutgers University College of Pharmacy. Oscar Scholz, Jr., is in charge of reservations for the event

Magazine sections of the Sunday papers (April 14th) carried the story of the expedition

of Clyde Eddy through the canyons of the Colorado. It is a well told thrilling story. Relative to the dangers and experiences in the Grand Canyon, as most of our readers know, Mr. Eddy gave a series of illustrated lectures on the subject. He is also known to members for his interest in the ASSOCIATION work.

Our fellow member J. Leon Lascoff, has made an extensive purchase from the John Wanamaker collection of drug jars and mortars. The mortars range from the 16th to the 19th century and are largely of English, French and Spanish design. The drug jars range largely about 1800 and all of them are interesting specimens—the purchaser has these on display in his pharmacy.

SOCIETIES AND COLLEGES

THE INTER SOCIETY COLOR COUNCIL

The annual meeting of the Inter Society Color Council was held at Columbia University College of Pharmacy, New York City, on February 21st. The AMERICAN PHARMACEUTICAL ASSOCIATION was represented by Dr. H. V. Army as official delegate. E. N. Gathercoal was a delegate of the U. S. Pharmacopoeia.

ACADEMY OF SCIENCES AND AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

The annual stated meeting of the National Academy of Sciences will be held under the presidency of Dr. W. W. Campbell in the building of the academy at Washington on April 22nd, 23rd and 24th. The autumn meeting will be held at the University of Virginia on November 18th, 19th and 20th.

The spring meeting of the Executive Committee of the American Association for the Advancement of Science will be held in New York City.

DOCTORS AND DRUGGISTS' MEETING

Over 100 doctors, hospital workers, nurses and druggists attended the first annual get together party sponsored by the San Angelo (Texas) Retail Druggists' Association. Members of the Tom Green (Eight) County Medical Society were guests of honor.

OFFICERS OF THE DISTRICT OF COLUMBIA PHARMACEUTICAL ASSOCIATION

The following officers were elected by the District of Columbia Pharmaceutical Association:

President, A. C. Taylor, *Vice Presidents*, J. G. Biggs, F. M. Campbell, M. Goldstein, G. W. Mathews, T. A. Moskov, H. J. Wener, *Secretary Treasurer*, W. Bruce Philip.

At the meeting on April 9th, pictures were shown illustrating the manufacture of glass ware by Whitall Tatum Co. and it is the aim of the Association to continue programs of pictures illustrating manufacturing processes.

THE NEW YORK PHARMACEUTICAL COUNCIL

The New York Pharmaceutical Conference has been reorganized and since April 1st the organization is now known as the New York Pharmaceutical Council made up of local pharmaceutical associations, fourteen such local groups are represented in the Council.

The convention was addressed by Hugo Mock and Secretary E. L. Newcomb of the National Wholesale Druggists' Association, and George W. Mather, Secretary of the New York State Board of Pharmacy. The following officers were elected:

President, F. L. Grennie, New Dorp, Staten Island, *Vice Presidents*, Henry Dansen, the

Bronx, Joseph Setaro, Long Island City, and Harry Brode Flushing, *Secretary*, Hugo Schaefer, Manhattan, *Treasurer*, Fred G A Schaefer, Brooklyn, *Members of the Board of*

Governors—George Gotteman, Brooklyn, Dr C P Wimmer, Manhattan, Morris Brodtkin, the Bronx, Charles Timen, Queens County and Edward McCrum, Richmond County

LEGAL AND LEGISLATIVE

CODE EXTENSION

At the time of this writing the Senate is continuing its study of the operation and effects of the NRA. The officials are determined to keep the code structure intact and workable pending passage of new legislation to extend the law beyond June 16th.

COPELAND BILL DEFERRED BY SENATE

Senate action on the Copeland food and drug bill (S 5) was indefinitely postponed when its author Senator Royal S Copeland of New York, asked that it be placed back on the calendar rather than passed as amended. This action was taken after a brief but stormy session in which the Senate adopted, by a vote of 44 to 29, an amendment, offered by Senator Josiah Bailey of North Carolina, to prevent multiple seizures on charges of misbranding which did not involve imminent danger to health. Earlier, Senator Copeland had announced that he would prefer no new legislation to such action and after adoption of the Bailey amendment he made good his threat by having the measure placed back on the calendar.

PRICE CONTROL BILLS IN CONGRESS

A bill to restrict the price discrimination section of the Clayton Act has been introduced in the house by Representative Carl Mapes of Michigan. This bill would amend Section 2 of the act by striking out all of the qualifications of the rule against price discrimination, which have made the act difficult to enforce. These qualifications include necessity of proving creation of a monopoly and provide for price differences based on quality or quantity or to meet competition. The Mapes bill (H R 4995) would make it unlawful for any person engaged in commerce either directly or indirectly to discriminate unfairly or unjustly in price between different purchasers of commodities within the jurisdiction of the Federal government. H R 6246 has been introduced by Representative Compton I White of Idaho. This would make it unlawful for any manufacturer to charge dif-

ferent prices to a chain store or mail order organization and to competing independent retail establishments.

NATIONAL RECOVERY ADMINISTRATION

In a memorandum sent April 12th to all code authorities and State and Regional NRA Directors, the National Recovery Administration emphasized the distinction between mandatory and permissive cost formulas or cost systems. Only mandatory systems which are integral parts of codes when approved, or those specifically approved by NRA are subject to enforcement. There are two types of cost formulas or cost systems—those that are mandatory and used in connection with selling below cost provisions in codes and those that are permissive and used for educational purposes only to the extent found practicable.

The National Recovery Administration also announced new rules regarding contributions from industry to the costs of code administration designed to relieve small firms of an inequitable burden, lessen multiple assessments, simplify collections and permit the rate of contribution to be reduced at any time.

NARCOTIC TRAFFIC

Another successful raid has been made by Federal agents bringing to light further information regarding illegal sale of narcotics, a book was found giving the names and addresses of possible purchasers.

The Narcotic Division is also studying the addiction to marihuana. It is said to be used in cigarettes and in other forms with tobacco and the Department advises the enactment of state laws controlling the use.

SALES TAXES

The following states have provided legislation creating sales taxes: Missouri 1½%, Maryland, Oklahoma, 1%, Arizona, Arkansas, Colorado, Idaho, Illinois, Indiana, Iowa, Michigan, Mississippi, North Dakota, South Dakota, Utah, Washington, West Virginia, Wyoming,

2%, California, 2½%, North Carolina, Kentucky, Ohio, 3%

A graduated sales tax is in existence in New Mexico and Vermont

Bills for sales taxes are still pending in Alabama, Connecticut, Georgia, Kansas, Maine, Massachusetts, Minnesota, Missouri, Montana, Nebraska, Nevada, New Jersey, North Carolina, North Dakota, Oklahoma, Rhode Island, South Dakota and Wyoming

RETAIL CODE AUTHORITY

The NIRB has approved an amendment to the code for the retail trade permitting incorporation of the code authority for the retail drug trade and of local committees for the trade. W S Elkin, Jr well known pharmacist, Atlanta, Ga has been appointed executive secretary of the National Retail Drug Code Authority. Together with Paul Pearson, as assistant to the secretary, he will aid E F Kelly, secretary-treasurer of the code authority, in handling the work of the headquarters office

COMMISSIONS FOR PHARMACISTS IN U S ARMY

Congressman Jed Johnson Oklahoma, introduced H R 7485 on April 12th. This bill has been referred to the Committee on Military Affairs, hence, a reference only to the bill is made

Pharmacists under this bill must be graduates of a recognized college of pharmacy. Section 4 provides for promotion to grade of first lieutenant after three years of service, further advancements to captain, major, lieutenant colonel and colonel after respective consecutive services of 6, 12, 20 and 26 years

ARIZONA

Governor B B Moeur has signed a bill drafted by the Arizona Pharmaceutical Association and passed by the Arizona legislature creating a state board of pharmacy

After a debate, during which Representative Porter, woman member in the House declared that cosmetics were as much of a necessity for women as shaving cream was for men, cosmetics were stricken from the luxury tax list

COLORADO

House Bill 557, which makes the state laws conform to federal laws governing sales of hypnotic drugs, was passed by the senate

GEORGIA

The uniform narcotic bill, designed to eliminate sales of illicit drugs in Georgia, was passed

by the house. A sub-committee of the Senate Finance Committee is studying the chain store tax bill passed by the house

CALIFORNIA

A 10 per cent tax on proprietary medicines and cosmetics, with but few exceptions, is provided in a bill recently introduced into the California legislature

Under a bill, the California board of health would have the power to regulate the sale of any drugs that it may deem dangerous, injurious or poisonous

NEW JERSEY

The New Jersey Fair Trade Bill, patterned after the California Fair Trade Law, has been signed by Governor Harold G Hoffman. The final clause of the measure puts the law into effect immediately

MARYLAND

Maryland has passed House Bill No 70, amending the Narcotic Law to more nearly conform with the Federal Law and the proposed uniform state laws, No 219 authorizing the State Board of Health to adopt regulations to bring the standard of foods and drugs in Maryland up to that required under the Mapes Act, No 604 prohibiting medical shows and the distribution of sample drugs from door to door

H 145 has passed the house and the senate, proposing to prohibit the retail sale and distribution of barbituric acid and other hypnotic and somnifacient drugs except on the prescription of a licensed physician, dentist or veterinarian. The drugs mentioned are to include barbituric acid, sulphonethylmethane (trional), sulphonmethane (sulphonol), diethylsulphon diethylmethane (tetronal), paraldehyde and chloral or chloral hydrate or chlorbutanol

OREGON

Oregon's Fair Trade Bill is framed to protect trade mark owners, distributors and the public against injurious and uneconomic practices in the distribution of articles of standard quality under a distinguished trade-mark, brand or name, placing certain limitations for resale upon commodities, and to repeal Chapter 311 Oregon Laws, 1933

WASHINGTON

Washington's Fair Trade Act relates to the sale of certain articles and commodities, providing protection for trade-mark owners, dis

tributors and the public against injurious and uneconomic practices in the distribution of articles and commodities of standard quality

under a distinguished trade mark, brand or name, prescribing penalties, and declaring that this act shall take effect immediately

BOOK NOTICES AND REVIEWS

Urinary Analysis and Diagnosis By LOUIS HEITZMANN M D With a chapter on the Determination of the Functional Efficiency of the Kidneys By Walter T Danreuther, M D, F A C S Professor of Gynecology and Director of Department, New York Post Graduate Medical School and Hospital, Columbia University Sixth edition Cloth Price \$5 00 Pp 385, with 131 illustrations Baltimore William Wood and Company, 1934

The text of this edition has been thoroughly revised and brought up to date by extensive changes and additions The work is presented in three parts Part I includes a discussion of the physical and chemical properties of urine the normally occurring organic and inorganic constituents of urine under normal and pathological conditions and the abnormal constituents including the proteins and carbohydrates Efficient methods of identification are given, and in some cases the more simple quantitative methods are described Considerable space is devoted to the identification of those normal constituents that might be confused with the abnormal Part II includes the general procedures for microscopic examination of urine, the identification of crystalline and amorphous urinary sediments of both organic and inorganic substances, pus, blood cells the various types of epithelial cells, mucus, cylindroids casts, animal parasites microorganisms of the hyphomycetes saccharomycetes and schizomycetes groups and extraneous matter which might be confusing such as foreign vegetable and animal fibres Part III is a continuation of the microscopic examination of urine with particular emphasis on the microscopic picture presented by various pathological conditions of the genito urinary tract and the interpretation of these findings There is a discussion of the tissue changes which occur under pathological condition and an effort is made to unravel the confusion in the nomenclature applied to the various types of kidney lesions Chapters on technique and interpretation of several methods of measuring kidney function and the hormone tests for pregnancy complete the book

In criticism it might be stated that it is unfortunate that the quantitative methods included have been limited to those simpler procedures which require little apparatus, but these omissions are offset by the detail and completeness of the material presented The sections devoted to microscopy are most comprehensive including many original plates which show both normal and pathological findings, and are evidences of the author's vast experience This book can be recommended as a complete reference for clinical urinary analysis, and should prove invaluable to technicians and to those physicians who do their own laboratory work It should also prove of value as a text in courses on urinalysis —JOHN C BAUER

The Romance of Exploration An interesting and well-illustrated book has been published by Burroughs Wellcome & Co, entitled, *Romance of Exploration and Emergency First Aid from Stanley to Byrd* It is largely an illustrated description of the display at the Century of Progress Exposition and presents the important achievements in discovery during the last two centuries together with illustrations depicting events of the explorations and means for first aid It impresses the importance of compact and reliable medical equipment and the close relationship of drugs to discoveries and progress of civilization

Dechema Monographs No 49-56 (6th volume), 8 lectures delivered at the conference of the Dechema, Deutsche Gesellschaft für chemisches Apparatewesen E V held at Würzburg in 1933 with 9 tables and 98 illustrations accompanying the text, Verlag Chemie G m b H Berlin 1934, published by the Dechema Deutsche Gesellschaft für chemisches Apparatewesen E V Price RM 5 —(for member RM 4 —)

In this volume, Professor W J Müller proposes a classification of chemical reactions according to the state of aggregation of the substances involved, which is important from an educational point of view, and interesting to the practical man in so far as he is able to grasp

the comparable points Other interesting subjects are included

We acknowledge with thanks the following reprints from The Wellcome Chemical Research Laboratory (The Wellcome Foundation, Ltd)
T A Henry, D Sc, *Director*

"The Irritant Constituent of Anti Leprotic Oils," by H Paget, J W Trevan and A M P Attwood

'Modified Cinchona Alkaloids, Part I Apoquinine and Apoquinidine," by T A Henry and W Solomon

'The Alkaloids of Alstonia Barks Part I *A Constricta*," F Muell, by T M Sharp

'The Alkaloids of Alstonia Barks Part II *A Macrophylla*, Wall, *1 Somersensis*, F M Bailey, *A Verticillata* F Muell *1 Villosa* Blum," by T M Sharp

'The Action of the Cinchona and Certain Other Alkaloids in Bird Malaria Part II,' by G A H Buttle T A Henry and J W Trevan

We are in receipt of a reprint from the Department of Pharmaceutical Research of the Shanghai Science Institute on the Chemical Composition of Daphne Genkwa by Manso Nakao and Kwong Fong Tseng courtesy of the *Journal of the Shanghai Science Institute*

We are in receipt of the following reprints from the F E Chidester Diabetes and the Thyroid Glands 'Biochemical Attacks on Insanity' 'Dehydrogenated and Unsaturated Substances in Relation to Cancer, Vitamins and Hormones' 'Endocrine Function, the Sympathetic Nervous System and Calcium'

Dr John C Krantz, Jr, has favored us with the following reprints 'Action of Trichloroethylene on Perfused Vessels of the Frog' 'A Note on the Assay of Reduced Iron' 'A Note on the Arsenic Test for Reduced Iron' 'Pharmacological and Chemical Studies of the Digitalis Group I Adonis Apocynum and Convallaria' 'Influence of Cesium Ions on Oxygen Demand of Sewage'

Receipt is acknowledged of Proceedings of the American Association of Colleges of Pharmacy for 1934

We have received a reprint from the German Apotheke on *Healing and Spice Drugs* for information of their citizens Also the following dissertation "Über die Alkylierung und Acylierung der Hydroxylgruppen des Morphins sowie über eine neue Darstellung des

Diacetylmorphins Inaugural Dissertation zur Erlangung der philosophischen Doktorwürde vorgelegt der Mathematisch - Naturwissenschaftlichen Abteilung der Philosophischen Fakultät der Universität Basel von Anton Baselgia, Apotheker aus Somvix (Graub) (Dr H Zornig and Dr H Fischer)

AWARD IN BIOCHEMISTRY

The biochemist to receive the first of the Eli Lilly and Company award has been selected by unanimous vote of the committee The committee which under the rules served with Edward Bartow, State University of Iowa, President Elect, as chairman consisted of H T Clarke Columbia University, L J Henderson, Harvard University, W R Bloor, University of Rochester, H B Vickery, Connecticut Agricultural Experiment Station, P A Shaffer Washington University, and D D Van Slyke The Rockefeller Institute

Dr Willard Myron Allen, to whom the award is given has done outstanding work in developing a sharply defined biological test for the action of the *Corpus luteum*, the use of this test is to isolate in crude form a potent extract and then the complete purification of the hormone now called 'progesterone'

Satisfactory progress is being made in the subscriptions to the fund raised to perpetuate the memory of Prof H G Greenish The memorial will take the form of a free place in the College of the British Pharmaceutical Society The Council of the Society has agreed to provide the free place at the College and the grant meets other expenses

Drs A C Frizer and V G Walsh of St Mary's Hospital Medical School, London report success in treatment of pneumonia with olive oil The olive oil is emulsified and then injected into the veins The treatment is being applied in other diseases

CALIFORNIA MEDICAL SOCIETY ENDORSES SICKNESS INSURANCE

Following the session of the House of Delegates of the American Medical Association in Chicago in February, a meeting of the house of delegates of the California Medical Association was held in Los Angeles A special committee of five, appointed by the house of delegates of the California Medical Association in 1934 submitted a report of a survey of health care in California and a plan for the administration of health insurance This committee, with an ad

visory council, had made the survey, which involved a study of medical practice as conducted by physicians, dentists, osteopaths, hospitals and clinics, and a direct study of the health care of the public obtained through 48 000 questionnaires secured from families by field workers and by mail. The cost of the survey was approximately \$80,000 00 of which some \$25,000 00 was supplied by the California Medical Association and the remainder through an appropriation by the government—*Jour A M A* for April 6th

DIVISION OF MEDICINAL CHEMISTRY PROGRAM AT NEW YORK

The program of the division of medicinal chemistry prepared for April 25th is being composed entirely of invited addresses. These are as follows: George Merck—'Tercentenary of Chemical Industry'; W F von Oettingen—'The Development of Industrial Medicine with Special Reference to the Problems and Tasks of Industrial Toxicology'; Michael Heidelberger—'The Chemistry of Bacterial Proteins'; Vincent du Vigneaud—'Present Status of the Oral Administration of Insulin'; Drs Small Mosettig and Eddy—'Latest Progress in the Search for Morphine Substitutes I The Morphine Series II The Phenanthrene and Dibenzofuran Series'; Wm P Murphy and Isabel Howard—'The Use of Intramuscular Liver Extract'; Movies

FEDERAL ALCOHOL CONTROL ADMINISTRATION

Section 4 of the Regulations Relating to Non-Industrial Use of Distilled Spirits and Wine (General Regulations, Series 4) is amended by adding thereto the following

(d) Members of the distilled spirits industry and the distilled spirits rectifying industry, engaged in the sale or other disposition of distilled spirits other than alcohol, for industrial use as above defined in containers of a capacity in excess of one gallon shall ship or deliver such distilled spirits directly to the industrial user thereof, and shall not sell or otherwise dispose of such distilled spirits to any person who is not actually engaged in the use of distilled spirits for industrial purposes

SAFER INSECTICIDES FOR VEGETABLES DEVELOPED BY AGRICULTURE DEPARTMENT

Wider use of pyrethrum and derris seems to be the answer to the grower's need for keeping

his leafy vegetables free from residues of the more toxic insecticides, according to W H White, in charge of truck crop and garden insect investigations, U S Department of Agriculture. Chemists and entomologists of the department have long sought substances that could be depended on to protect growing crops against destructive insect pests and still leave nothing harmful to human beings on the product to be marketed. Scientists working on the problem have found that minute quantities of two plant products—derris and pyrethrum—kill many insects feeding on truck crops and are less likely than most inorganic insecticides now in common use to leave harmful residues. Insecticides made from derris and pyrethrum are now on sale in most seed and drug stores in the United States. Plant specialists of the department are investigating the possibilities of growing insecticidal plants in this country.

In 1916 Edward V Sheely was elected president of the Tennessee Pharmaceutical Association and in 1917 he was appointed a member of the State Board of Pharmacy, on which he served the allotted term of five years. When in 1927, he was prevailed upon by the political powers in command to accept the Memphis postmastership he moved into the new environment and shouldered the new responsibilities with characteristic zest and confidence. He did not lose touch with pharmacy during this tenure of office.

George M Gales has resigned as member of the National Retail Drug Code Authority. The code authority will consider Mr Gales' action at its next meeting.

Carleton B Joeckel, library authority now on the faculty of the University of Michigan, has been appointed Professor of Library Science in the Graduate Library School of the University of Chicago. Dr Joeckel's appointment becomes effective October 1, 1935.

ALUMNI MEETING PITTSBURGH COLLEGE

The Alumni Meeting of the Pittsburgh College of Pharmacy will be held at Cedar Point, Sandusky, July 16th to 20th. E Bruce Dawson of Cleveland, has been elected to act as Secretary. Among the speakers will be Prof James H Beal, Dean C Leonard O'Connell and Dr George D Beal.

The Program Committee is preparing a Year Book to be presented to each member of the Alumni.

IDAHO PHARMACY LAW FAILS

Due to amendments designed to kill the pharmacy bill proposed by the Idaho Association the enactment of the measure failed

UTAH CHANGES PLACE FOR MEETING

Utah State Pharmaceutical Association will meet in Salt Lake City instead of Provo, the date of the meeting has not been fixed

NOTICE TO CONTRIBUTORS TO THE JOURNAL AMERICAN PHARMACEUTICAL ASSOCIATION

The following notice has been prepared from comments received from members of the Board of Review of Papers and of the Publication Committee

Manuscripts should be sent to Editor E. G. Eberle, 2215 Constitution Ave., N. W., Washington, D. C.

All manuscripts should be typewritten in double spacing on one side of paper 8 1/2 x 11 inches, and should be mailed in a flat package—not rolled. The original (*not* carbon) copy should be sent. The original drawings, not photographs of drawings, should accompany the manuscript. Authors should indicate on the manuscript the approximate position of text figures. All drawings should be marked with the author's name and address.

A condensed title running page headline, not to exceed thirty-five letters, should be given on a separate sheet and placed at the beginning of each article.

The method of stating the laboratory in which the work is done should be uniform and placed as a footnote at end of first page giving Department, School or College. The date when received for publication should be given.

Numerals are used for figures for all definite weights, measurements, percentages and degrees of temperature (for example 2 Kg, 1 inch, 20 cc, 300° C). Spell out all indefinite and approximate periods of time and other numerals which are used in a general manner (for example one hundred years ago, about two and one half hours, seven times).

Standard abbreviations should be used whenever weights and measures are given in the metric system, e. g. 10 Kg, 225 cc, etc. The forms to be used are cc, Kg, mg, mm, L and M.

Figures should be numbered from 1 up, beginning with the text figures (line engravings are always treated as text figures and should be designed as such) and continuing through the plates. The reduction desired should be clearly indicated on the margin of the drawing. All drawings should be made with India ink, preferably on white tracing paper or cloth. If coordinate paper is used, a blue lined paper must be chosen. Usually it is desirable to ink in the large squares so that the curves can be more easily read. Lettering should be plain and large enough to reproduce well when the drawing is reduced to the width of a printed page (usually about 4 inches). Photographs intended for half tone reproduction should be securely mounted with colorless paste.

"Figure" should be spelled out at the beginning of a sentence, elsewhere it is abbreviated to "Fig.," per cent—2 words.

The expense for a limited number of figures and plates will be borne by the JOURNAL, expense for cuts in excess of this number must be defrayed by the author.

References to the literature cited should be grouped at the end of the manuscript under the *References*. The citations should be numbered consecutively in the order of their appearance (their location in the text should be indicated by full sized figures included in parentheses). The sequence followed in the citations should be Author's name (with initials), name of publication, volume number, page number and the date in parentheses. Abbreviations for journals should conform to the style of *Chemical Abstracts* published by the American Chemical Society.

(1) Author A. Y. *Am J Physiol* 79:289 (1927).

Papers presented at the Sections of the AMERICAN PHARMACEUTICAL ASSOCIATION'S annual meeting become the property of the Association and may at the discretion of the Editor be published in the JOURNAL. Papers presented at these Sections may be published in other periodicals only after the release of the papers by the Board of Review of Papers of the JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

The Editor will appreciate comments from Board of Review and Committee on Publication members, authors and others interested.

PLANT SCIENCE SEMINAR

PORTLAND MEETING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

The 13th annual meeting of the Plant Science Seminar will be held at North Pacific College, Portland, Ore. Announcements regarding the tour have been sent out, much information is given in the April JOURNAL and further details may be obtained by addressing the Local Secretary, Dean A. O. Mickelsen, N. E. 6th Ave. at Oregon, Portland, Ore.

The local committee is planning a program of field trips, lectures and visits of interest in the vicinity of Portland. The Seminar will make a two-day trip to Corvallis, stopping at points of interest under the direction of Prof. E. T. Stuhr. The local flora of Willamette Valley will be studied and a visit made to the drug farms where Hydrastis, Ginseng and Peppermint are cultivated.

OREGON SCENERY

It is inherent in Americans to love the mountains, nature's wilds that endure down through the centuries. Oregon has its Coast Range, the Cascades, the Siskiyou, the Blue Mountains and other lesser groups. Here deep in the forests, in flower-covered meadows that nestle high above the world, alongside of lakes that dot the mountains like jewels inset in this wondrous panorama of nature, one may forget the troubles of the outside world. In fact, he can forget that any other world except this new one of peace and supreme contentment exists.

Crater Lake in Southern Oregon, a day's journey from Portland, is alone worth a trip across the continent, a miniature sea of sapphire, a jewel of wondrous blue set deep down in a rocky clasp of the Cascade mountains.

Go to the ends of the earth and nowhere will you find a body of water that matches it in magnificence and beauty. Neither is there any lake that matches it geologically.

Portland's parks, some with their natural lakes and virgin timber that has been preserved within their borders and beautified by wondrous rose gardens, other plants and shrubbery, are themselves worth a day of your time.

INFORMATION

For information relative to program, rates and routes address the local committee or E. N. Gathercoal, 701 So. Wood St., Chicago. H. C. Christensen, 130 No. Wells St., Chicago. C. B. Jordan, Purdue University, La Fayette, Ind. F. H. Eby, 1808 Spring Garden St., Philadelphia, Pa. F. J. Bacon, Western Reserve University, Cleveland, Ohio.

See JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION for April and in this issue of the JOURNAL.



A. O. MICKELSEN

JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

VOL XXIV

MAY, 1935

No 5

THE LOCAL SECRETARY OF THE PORTLAND MEETING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

This brief sketch introduces the local secretary, A O Mickelsen, of the AMERICAN PHARMACEUTICAL ASSOCIATION for the meeting to be held in Portland, Ore., August 5th-10th

Prior to the World War, Mr Mickelsen specialized in commerce and public accounting, but due to an injury sustained during service, he concluded to engage in other activities and chose pharmacy, his training includes a college course in law He became associated with the School of Pharmacy, North Pacific College of Oregon, for six years he served as instructor, then advanced to professor and, later, was elected dean

It was largely through his efforts that a branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was organized in Portland When the American Medical Association held its meeting in Portland (1928) Dean Mickelsen was chairman of the U S P exhibit which was awarded the national certificate of merit for an outstanding educational display of the convention He has been active in radio talks and publicity in behalf of professional pharmacy and was local chairman of Pharmacy Week He has been associated with Kappa Psi for more than twelve years, for two years he served as satrap of the Northwestern Province and was instrumental in installing Pi Chapter of Rho Chi at the North Pacific College and is grand regent of Kappa Psi

Dean Mickelsen is deeply interested in advancing the professional relations of dentistry and pharmacy, he is vice-president of the American Association of Colleges of Pharmacy, state chairman of food and drug legislation, representing the former association, and president of the North Pacific branch, A P H A He was a member of the committee of five members who compiled the Pacific Drug Review prescription schedule

He is a member of Post No 1 of the American Legion, Portland, Ore

EDITORIAL

E G EBERLE, EDITOR

2215 Constitution Ave , WASHINGTON, D C

INTERNATIONAL CONGRESS OF MILITARY MEDICINE AND PHARMACY

IN former years no funds were available for delegates to the International Congress of Military Medicine and Pharmacy. Funds are to be provided this year by the adoption of a resolution submitted by the Committee on Foreign Affairs, providing for an appropriation of \$8000.00 or so much thereof as may be necessary for expenses of participation by the United States in the 8th International Congress of Military Medicine and Pharmacy to convene at Brussels in June 1935.

Comment on prior meetings was made in the April JOURNAL. Secretary Cordell Hull believes that no less than 10 delegates should be sent from the United States and, certainly, pharmacy should be represented.

The Congress of Pharmacy convenes in Brussels on July 30th, and a very interesting program has been prepared, which was published in the *Journal de Pharmacie de Belgique*. There is more or less of a relationship between the two organizations and presents the opportunity for representation at both conventions. A wide range of papers has been listed for the Congress of Pharmacy, some of which may find application in the International Congress of Military Medicine and Pharmacy, thus, a paper by A. J. J. Van der Velde on "Research on the Sterilization and Biochemical Control of Pharmaceutical Products," "The Toxicity of Certain Insecticides," ably presented by Dr. Hampshire and Professor Schoofs, and quite a number of subjects were discussed by pharmacists at earlier Congresses, among the latter, the preparation of tablets, ampuls, methods of sterilization were shown, and a motor pharmacy demonstrated. European pharmacy was heretofore represented, but the writer's records do not show participation by American pharmacists.

THE PHARMACIST IN LITERATURE AND THE MUSEUM OF THE AMERICAN INSTITUTE OF PHARMACY

THE *Bulletin de la Société d'Histoire de la Pharmacie* (France) for March presents a statement from the pharmacy of J. B. Caventou for "La Dame aux Camélias" from the collection of P. Lemay. The bill-head carries the inscription and face of the medal of award by the Royal Institute of France of the grand prize for the discovery of quinine sulphate by Pelletier and Caventou. There is further interest attached because only two of the novels of Dumas, the younger, survived, one of these "La Dame aux Camélias," from which book came the immortal drama by the same title.

In the Sunday *Times Herald* (Dallas, Tex.), April 21st, William D. Hornaday writes of an unfinished O. Henry story in a counter blotter of the drug store of J. J. Tobin, Austin, Texas, recently discovered. The story bears no title and is written in long hand by the author and reproduced in the *Times Herald*, but not reproduced in the JOURNAL at this time, because no reference is made of drugs. In Austin there abounds a wealth of O. Henryana, one of our fellow-members, the late H. L. Carleton, was manager of the Tobin drug store for a time, he informed the writer that years passed and O. Henry had left Texas before he knew William

Sydney Porter and O Henry was the same person It may be of interest to note that this master of the American short story selected as his *nom de plume* a name from the U S Dispensatory under Diluted Hydrocyanic Acid, that of O Henry, referred to in connection with a proposed test, perhaps Porter was looking up data on poisons to be used in his writings

Through a grant from the Carnegie Corporation and with the cooperation of the School Art League, the Folk Arts Museum at Riverdale is open to the public, Mrs Eli Nadelman is the director Walter Rendell Storey contributed an illustrated article to the *New York Times Magazine* for April 28th on the museum, in which are ensembles of furnishings, including an early American Pharmacy, with shelves, counters, bottles, jars, some still full of old herbs and drugs Other types of displays are described

These comments are made to enlist the interest of possible contributors to the museum of the American Institute of Pharmacy, where the history of American pharmacy should be arranged and displayed

FEDERAL DRUG LEGISLATION MUST NOT BE PERMITTED TO DIE

BY ROBERT P FISCHELIS *

AS usually happens about this time of the year in matters of controversial Federal legislation, the situation with reference to Food and Drug legislation has reached a point where proponents, opponents and those who favor revision in part, must either effect compromises on disputed points or demonstrate that one or another group has marshaled sufficient support to be able to win when the matter comes to a vote in the Senate and House of Representatives The only other alternative is to allow this proposed legislation to die and perhaps revive it at a later session of the Congress

It appears to impartial observers that neither the proponents of the present Copeland bill nor its opponents nor those favoring partial revision can get all they want Certain amendments introduced by Senator Bailey of North Carolina and others proposed by Senator Clark of Missouri have met opposition by Senator Copeland It is somewhat difficult to decide on what basis and in whose behalf some of the proposed amendments have been offered because there has been much "under cover" activity in connection with this legislation

All of this must seem rather confusing to consumers of foods and drugs and to those producers and distributors who have no particular axe to grind and who can meet practically any standard which the Government might set with respect to quality, labeling, advertising or distribution of their product

It is difficult to understand why minority groups, whose chief interest in food and drug legislation is to block efforts to compel truthful labeling and advertising of foods and drugs and to ease the path of fakers in the food and drug industries, should be in a position to thwart the efforts of earnest legislators and respectable citizens in providing proper control of the manufacture and distribution of drug products

* President AMERICAN PHARMACEUTICAL ASSOCIATION

The answer is to be found in the peculiar partnerships which spring up between respectable members of industries and their predatory competitors when they either believe or are stampeded into believing that they are menaced by a common enemy. For example, one can hardly conceive of certain manufacturers of prescription products lining up with patent medicine manufacturers against the Government in matters of drug legislation when it is remembered how strongly the first-named group endeavors to emphasize to the medical and pharmacal professions and to the public its highly ethical conception of the function of drug manufacturers in the field of medical care. Again, it is difficult to understand why patent medicine manufacturers, after proclaiming the establishment of a self-imposed censorship of their advertising and engaging supposedly competent medical and technical advisers to keep themselves out of trouble, should oppose legislative confirmation of this admittedly necessary activity which would extend its benefits to all members of the industry and to all consumers of drugs and medicines.

What is there in the record of Food and Drug law enforcement by the Federal Government for the past thirty years that justifies any lack of confidence or the withholding of sufficient power to protect the public against the vicious and unethical practices which the proposed food and drug law prohibits?

American pharmacy and the drug industry simply cannot afford to allow the proposed legislation to die. The onus of failure to pass adequate legislation at this session must not be laid at our doorstep. It is not only fair play for the public and fair play for honest manufacturers and distributors of drugs and medicines but also extremely expedient for the drug industry to advocate "action and action now" on the bill without interposing further impossible conditions of compromise. Let it not be said that American consumers of foods and drugs have been deprived of proper protection against charlatans and betrayers of the confidence of the readers of our popular magazines and listeners to radio-broadcasts because the drug industry of the United States gave aid and comfort to its moral outlaws by objecting to regulations which are in the public interest.

THIRD NOTICE FROM THE COMMITTEE ON TRANSPORTATION

T. J. BRADLEY, CHAIRMAN

Several tours to Alaska will be available at the close of the Portland meeting of the ASSOCIATION. These include 9-day tours from Seattle to Skagway at eighty five dollars for fare, meals and berth, and there will be no additional railroad fare to Seattle for those who are returning by way of that city, and several more extensive tours are available at proportional rates. Inquiries about these tours should be addressed to Local Secretary A. O. Mickelsen, N. E. 6th Ave., at Oregon, Portland, Oregon.

Several suggested routes, to and from Portland, were given in the April number of the JOURNAL, and the rates for the round trip, going by way of these or other routes and returning by another route are very low. It is not likely that we shall ever have a more favorable opportunity to visit the far west, and it should not be missed. Certificates will not be needed this year, to secure the low excursion rates, and any tourist agents will be able to give the members exact rates from their home cities, with other particulars.

SCIENTIFIC SECTION

BOARD OF REVIEW OF PAPERS—*Chairman*, F E Bibbins, George D Beal, L W Rising, H M Burlage, L W Rowe, John C Krantz, Jr Heber W Youngken

ALKALOIDAL REAGENTS VII THE DETECTION OF THALLIUM *

BY JAMES C MUNCH¹ AND JUSTUS C WARD

In connection with our studies on thallium the need arose for rapid, sensitive, specific methods of qualitative detection and of quantitative determination, in tissues, plants, soils and various types of products

Thallium forms two series of compounds, being monovalent and trivalent In general the trivalent or thallic compounds are unstable, being reduced to the thalious products Commercial material used for cosmetics, medicinal and rodenticidal purposes is almost entirely thalious thallium

In the flame, thallium compounds dissociate, liberating Tl which produces a characteristic green color and spectrum If this flame is allowed to strike on a cold surface, a brown mirror of Tl forms (73) In the Marsh apparatus the stain produced is similar to that produced by arsenic, but it gives a characteristic yellow color with iodine and is insoluble in ammonium sulphide (11) Spectroscopic studies of the emission spectra (67) show a number of characteristic lines, between 2552.9 Å and 7117.0 Å In the visible spectrum the line usually considered to be characteristic is at 5350.47 Å Using the spectroscope, a number of qualitative investigations have been conducted (16, 25, 41, 43, 45, 51, 57, 72, 79, 82, 84, 99) The limit of sensitivity is reported to be 1 gamma, although Lamy claimed that he was able to detect 0.002 gamma of thallium by following the 5350 line We have used the spectroscope in our investigations, but have also made a detailed search of the literature and a specific study of the more promising reactions with the view of developing quick methods to use when a spectroscope is not available Our detailed results are given in Tables I and II

TABLE I—QUALITATIVE DETECTION OF THALLOUS THALLIUM

No	Name of Reagent	Color in Solution	Color of Precipitate	Threshold Mg Tl/Cc	Literature References
1	H ₂ SO ₄	None	None		
2	HNO ₃	None	None		
3	Froehde	None	White	20	
4	Marquis	None	None		
5	Mayer	None	Curdy light yellow	0.2	
6	Dragendorff	None	Brown black	2	
7	Wagner	None	Brown-black	2	
8	Picric acid	None	Yellow needles, prisms	20	(91)
9	FeCl ₃	None	White needles	0.2	
10	K ₂ Cr ₂ O ₇ , NH ₃	None	Orange yellow cryst	0.2	(91)
11	K ₄ Fe(CN) ₆	None	Yellow	20	
12	" , Ca(CH ₃ COO) ₂	None	White	20	(1)
13	KMnO ₄ , HCl	Pink		0.2	(7, 17, 18, 42, 46,
		none	Red brown white		58, 71, 104)

* Scientific Section A Ph A, Washington meeting, 1934

¹ Bureau of Biological Survey Glen Olden, Pennsylvania, and Denver, Colorado

14	PtCl ₄	None	Yellow octahedra	0 02	(3, 59, 80)
15	Schiebler	None	Yellow-white	2	
16	U Acetate	None, yellow	Yellow prisms	0 2	(19)
17	Mecke	None	None		
18	Millon	None	Yellow white curd	0 2	
19	Na alizarin sulphonate, 0 5%	Dark blue	Blue-yellow	20	(40)
20	Alkanna, NH ₃	Blue	None		(32)
21	Al	None	None		(59)
22	Al ₂ O ₃	None	White prisms	0 2	(42)
23	SbCl ₃ , KI, dilute	None	Orange yellow	0 2	(27)
24	K Antimonyl tartrate	None	White prisms	20	
25	Na ₂ AsS ₃	None	None		(20)
26	As ₂ S ₃ , H ₂ S	None	Gray black	0 2	
27	Benzidine	Blue	Blue	20	(29 41)
28	Na benzoate	None	None		
29	BiCl ₃	None	White	0 2	
30	Br, NH ₃	None	White	0 2	(12 89)
31	HBr	None	Pale yellow	2	(26, 59)
32	NaBrO ₃ or Mg(BrO ₃) ₂	None	White	20	(58, 80, 89 103 106)
33	CdCl ₂	None	White	0 2	
34	Ce(SO ₄) ₂ , N/10 HCl	Pale yellow	None		(6, 86 103)
35	HCl	None	White	0 2	(3, 26, 59 69)
36	KClO ₃	None	None		
37	Citric acid	None	None		
38	Na ₂ Co(NO ₃) ₆ , fresh 6%	None	Brick red	0 2	(90, 95)
39	Cr(NO ₃) ₃ test paper	None	Green yellow	20	(61)
40	K CrO ₄	None	Yellow	0 2	(12, 14, 21, 41, 42 55, 62 63, 65 66, 75 81)
41	HCHO	None	Gray-white	20	
42	K ₃ Fe(CN) ₆	Yellow	None		(4, 13 33, 55, 80, 96, 97)
43	AuBr ₃ , fresh, hot	None	Yellow	20	
44	Hydroquinone	None	None		
45	HI	None	Yellow	0 2	(2, 3 4, 11, 14, 22 23, 26, 27, 31, 34-37, 41, 44, 47, 52-54, 58, 59, 67-71, 76, 85, 87, 88, 90, 97, 98, 102, 105)
46	NaIO	None	Dark brown	100	(101)
47	KIO ₃ , HCl	None	White plates	200	(5, 10, 24)
48	Ir(NO ₃) ₃	None	Yellow white		(28)
49	NaF or NH ₄ F	None	Yellow-white	20	(106)
50	Mg	None	Black deposit	0 2	(90)
51	NH ₄ Molybdate	None	White leaves	0 2	(38 39 91)
52	Sat <i>a</i> naphthol, di- methyl - <i>p</i> - phenyl- enediamine	None	None		(56)
53	Ozone	None	Brown		(83)
54	PdCl ₂	None	Cinnamon-brown	0 2	

55	AuPdCl ₃ HCl	None	Cinnamon brown	0 2	(94)
56	Na ₂ HPO ₄ , alkaline soln	None	White	20	(80)
57	KH ₂ PO ₄ alkaline soln	None	White	20	
58	Phosphomolybdic acid HNO ₃	None	Yellow	2	(38, 39, 74 80)
59	Phosphotungstic acid	None	Milky white	0 2	
60	ReO ₄ I ₂	None	Dark plates		(49)
61	K ₂ ReBr ₆	None	Violet		(48)
62	K ₃ ReCl ₆	None	Dark brown		(48)
63	K ₄ ReCl ₆	None	Brown-yellow		(48)
64	Saccharin	None	White rods, needles	20	(77)
65	Silicotungstic acid	None	Milky white	0 2	
66	AgNO ₃ , alkaline soln	None	Dark brown	0 2	(100)
67	H ₂ S	None	Black	0 2	(15, 59, 64, 80 82, 92)
68	S impurities in benzine, TI ethylate	None	Orange		(50, 60)
69	S impurities in benzine, dimethyl-TI-ethylate	None	Orange		(50, 60)
70	S impurities or CS ₂ , TI acetyl-acetone	None	Orange		(30 50)
71	S impurities or CS ₂ , TI- yellow, CH ₃ Bz	None	Carmine		(30)
72	S impurities or CS ₂ , TI- yellow, AcCH ₂ Bz	None	Cinnabar		(30)
73	CS ₂ , TI yellow, AcCH- MeBz	None	None		(30)
74	CS ₂ , TI yellow, AcCH ₂ - COCOOEt	None	None		(30)
75	CS ₂ , TI yellow, BzCH ₂ - COCOOEt	None	None		(30)
76	CS ₂ , TI yellow, EtO- OCCOCH ₂ COOEt	None	None		(30)
77	CS ₂ , TI yellow, AcCH ₂ - COOEt	None	Yellow		(30)
78	CS ₂ , TI yellow, BzCH ₂ - COOEt	None	Orange red		(30)
79	CS ₂ , H ₂ S NH ₃	None	Vermillion	0 2	(75)
80	KSCN	None	White prisms needles	20	(91 93)
81	Na ₂ S O ₃	None	White prisms, rods	20	(9 91)
82	Tartaric acid	None	White prisms	20	(91)
83	Tannic acid NH ₃	Red	Yellow-green	20	
84	TiO ₂	None	None		
85	SnCl ₂ , KI	None	Dark yellow	0 2	(94)
86	SnCl ₂ , H ₂ S	None	Gray-white	0 2	(43)
87	Na Tungstate, 5%	None	White plates	20	(39)
88	Urea	None	None		
89	NH ₄ metavanadate	None	None		
90	Zn	None	Black deposit	0 2	(59, 79, 80)

TABLE II—QUALITATIVE DETECTION OF THALLIC THALLIUM

No	Name of Reagent	Color in Solution	Color of Precipitate	Threshold Mg TI/Cc	Literature References
1	H ₂ SO ₄	None	None		
2	HNO ₃	None	None		
3	Froehde	None	None		
4	Marquis	None	None		

5	Mayer	None	None		
6	Dragendorff	None	None		
7	Wagner	None	None		
8	Picric acid	None	None		
9	FeCl ₃	None	None		
10	K Cr O ₇	None	None		
11	K ₄ Fe(CN) ₆	None	None		
12	KMnO ₄	None	None		
13	PtCl ₄	None	None		
14	Schiebler	None	None		
15	U Acetate	None	None		
16	Mecke	None	None		
17	Millon	None	None		
35	HCl	None	None		(3, 26, 59 69)
45	HI	None	Yellow	20	(See Table I)
52	Sat <i>a</i> naphthol dimethyl <i>p</i> -phenylenediamine	Blue	None	20	(56)
64	Saccharin	None	None		
79	CS H S, NH ₃	None	Black	20	(75)
80	KSCN	None	Pale yellow	20	(91 93)

It must be remembered that working conditions in various laboratories may influence the delicacy of response of these qualitative tests. We have suggested the approximate sensitivity of some of these reactions, solely as suggestion of their routine application, rather than as absolute limits for threshold reactions.

In making these tests, thallic sulphate and various thallous compounds were used (usually thallous sulphate). Since the atomic weight of thallium is 204.1 a normal solution would contain about twenty per cent of Tl. Our stock solutions were prepared as *N*/10 and *N*/1000 solutions with respect to Tl. When these solutions have given positive results, further dilutions have been prepared to determine the approximate threshold of sensitivity.

CONCLUSION

Qualitative tests for thallium have been studied, using ninety reagents

REFERENCES

- (1) Arnal, T. G. A sensitive reagent for the thallous ion, 'Anal. soc. españ. fís. quim.' 24, 153-155 (1926), *C. A.*, 20 2297 (1926)
- (2) Barbaglio, V. Sulla ricerca microchimica dell tallio nei tessuti, "Studi Sassaresi", 8, No. 3 (1930)
- (3) Behrens through Reference No. 59
- (4) Berry, A. J. Studies on thallium compounds. I. Analytical, "J. chem. soc." 121 394-399 (1922)
- (5) Berry, A. J., 'The direct titration of thallous salts by potassium iodate' "Analyst", 51, 137-139 (1926)
- (6) Berry, A. J., "Experiments on quantitative oxidation with ceric sulphate" "Analyst", 54, 461-464 (1929)
- (7) Bodner, J., and Terenyi, A., "Einsache und schnelle analytische Methoden zur Bestimmung des Wirkungssubstanzgehaltes von Pflanzenschutzmitteln. I. Mitt. Titrimetrische Bestimmung des Thalliums in Zeliopreparaten," *Z. anal. chem.* 69, 29-36 (1926)
- (8) Bogorodskii, A. Ya., and Troitzkii, M. V. The determination of thallium volumetrically, "J. gen. chem. (U. S. S. R.)", 1 895-899 (1931)
- (9) Ballard, A., 'Reactions microchimiques de l'acide thiosulfurique' "Compt. rend. acad. sci.", 169 651-654 (1919)

- (10) Bolland, A, Mikrochemische reaktionen der jodsaure, *Compt rend* 171, 955 (1920), through *Jahr Pharm*, 56, 101 (1921)
- (11) Braly, A, "New simple and rapid method for collection and identification of coatings produced by metalloids and metals capable of volatilization before the blow pipe," *Compt rend acad sci*, 170, 661-663 (1920), *C A*, 14, 1946 (1920)
- (12) Browning, P E, 'Estimation of thallium after oxidation with bromine,' *Ind Eng Chem, Anal Ed*, 4, 417 (1932)
- (13) Browning, P E, and Palmer, H E, Volumetric and gravimetric estimation of thallium in alkaline solution by means of potassium ferricyanide ' *Am J Sci*, 27, 379-380 (1909)
- (14) Browning P E, Simpson, G S, and Porter, L E, "The qualitative separation and detection of (I) Tellurium and Arsenic, and (II) of Iron, Thallium Zirconium and Titanium " *Am J Sci* 42, 106-108 (1916)
- (15) Bruner, L, and Zawadzki, J, "The precipitation of thallium sulphide with other sulphides " *Arz Akad Wiss Krakau*, 312-321 (1909)
- (16) Buschke, A, and L Berman, Über chemische und biologische Beziehungen zwischen Thallium und Blei," *Klin woch*, Nr 51 (1927)
- (17) Buschke, A, and Langer, 'Die forensische und gewerblich-hygienische Bedeutung des Thalliums " *Münch med woch*, 74, 1494-1497 (1927)
- (18) Buschke, A, and Peiser, B, 'Die biologischen Wirkungen und die praktische Bedeutung des Thallium," *Erg allg path u path anat*, 25 1-57 (1931)
- (19) Chamot, E M, and Bedient, H A, "Uranyl acetate as a reagent in microscopic qualitative analysis," *Mikrochemie*, 6, 13-21 (1928), *C A* 22 3602 (1928)
- (20) Cuta, F, 'Oxidation of thallous salts to thallic and reduction of the thallic salts with sodium arsenite " *Collection Czechoslov Chem Communications*, 5, 287-301 (1933), *C A*, 28, 62 (1934)
- (21) Cuttica, V and Canneri G 'Thallous ferricyanide," *Gazz chim ital*, 51, 169-174 (1921)
- (22) Clavera, J M, and Guardiola, J E, "Chemische und pharmakologische des in der Dermatologie benutzten Thalliumsalzes," *Anal soc españ fis quim*, 28, 728-741 (1930)
- (23) Crookes, W Rudisule VI (1923), Ref 80
- (24) Demges G, "Micro reactions of the iodate ion," *Bull soc pharm Bordeaux*, 58 211-214 (1920)
- (25) Deutsch J 'Ein Fall von akuter Thalliumvergiftung mit Zehlo Rattengiftkornern," *Klin woch*, 8, 2052-2055 (1929)
- (26) Enck E G, Thallium and its uses," *Foot-Prints* 2, 11-17 (1929)
- (27) Ephraim, F, 'New reaction of thallium salts " *Z anorg chem*, 58, 353-355 (1909)
- (28) Ferrari, A, and Colla, C, "Iridionitrites of ammonium potassium, rubidium caesium and thallium, *Gaz chim ital*, 63, 507-513 (1933), *C A*, 28 427 (1934)
- (29) Feigl, F, "The application of diphenyl derivatives to qualitative reactions," *Chem - Ztg*, 44, 689-690 (1920)
- (30) Feigl F and Bäcker, E, VIII Several addition compounds of thallium dienolic salts with CS₂ " *Univ Wien Monatsh*, 49, 385-400 (1928), *C A* 22 3659 (1928)
- (31) Fert, W, 'Volumetric determination of thallium " *Zeit anal chem*, 28 314 (1889) *Proc A Ph A* 38 570 (1890)
- (32) Formanek, through reference No 80
- (33) Fresno, C del and Valdes, L, "Potentiometric titrations with potassium ferricyanide in alkaline solution II Arsenic, antimony, tin and thallium " *Z anorg allgem chem*, 183, 258-262 (1929) *C A*, 24 38 (1930)
- (34) Fridli, R Fatal thallium poisoning and determination of thallium in cadavers as thallous iodide " *Ber ungar pharm Ges*, 4 43-49 (1928), *C A*, 23, 1840 (1929)
- (35) Fridli R 'Über die jodometrische Bestimmung des Thalliums Die Bestimmung desselben in Leichenteilen," *Ber ung pharm Ges*, 5, 531-532 (1929)
- (36) Fridli, R, 'Über die jodometrische Bestimmung des Thalliums, Auch in Gegenwart von Ferriessen " *Deut zeit ger med*, 15 478-488 (1930)
- (37) Fridli, R, "Iodometric determination of thallium in the presence of ferric iron The determination in the cadaver," *Deut zeit ger med* 15 478-488 (1930) *C A* 25 262 (1931)

(38) Gaspar, T A , 'A study of molybdates nitrophosphomolybdates, tungstates and phosphotungstates and their reactions,' *Anal soc españ fis quim* , 26, 435-445 (1928), *C A* , 23, 2119 (1929)

(39) Gaspar, T A , Notes on molybdates, nitrophosphomolybdates, tungstates and phosphotungstates," *Ann chim anal chim appl* , 2, 97-103 (1929), *C A* , 23, 3186 (1929)

(40) Germuth, I G , and Mitchell C , ' Detection and identification of specific cations with sodium alizarin sulphonate reagent," *Am J pharm* , 101, 46-52 (1929)

(41) Goroncy and Berg, "Über Thalliumvergiftung," *Deut zeit ger med* , 20, 215-236 (1933)

(42) Hawley, L F , ' Contribution to the chemistry of thallium I," *J am chem soc* , 29, 300-304 (1907)

(43) Hawley, L F , ' Contributions to the chemistry of thallium II," *J am chem soc* , 29, 1011-1018 (1907)

(44) Hebbeling, *Ann* 134, 13 (1865), through Reference No 80

(45) Heinen, W , Thallium Vergiftung (Selbstinordversuch mit Zeliopaste)," *Samm lung von Vergiftungsfallen* , 2 27 (1931)

(46) Jilek, A , and Lukas, J Studien über die massanalytische Bestimmung von Thallium I Salzen mit Kaliumpermanganat in salzsaurer Lösung," *Chemische Listy* , 23, 124-129, 155-162 (1929), through *Jahr Pharm* , 64 118 (1929)

(47) Kolthoff, I M The use of iodine electrode in potentiometric titrations," *Rec trav chim* , 41, 172-191 (1922), *C A* , 16, 2277 (1922)

(48) Krauss F and Steinfeld H , Zur Kenntnis der Verbindungen des 3- und 4-wertigen Rheniums (Beiträge zur Chemie des Rheniums, III Mittel) " *Ber* , 64, 2552-2556 (1931)

(49) Kronman E S and Berkman, N , 'New microchemical test for Rhenium," *Z anorg allgem chem* 21 277-280 (1933), *C A* , 27 681 (1933)

(50) Kurowski, E Thallo Acetylacetonat " *Ber* , 43, 1078-1079 (1910)

(51) Lamy A Sur les effets toxiques du thallium " *Compt rend acad sci* , 57, 442-445 (1863)

(52) Lepper W Gravimetric determination of thallium in Zelio' products " *Z anal chem* , 79, 321-324 (1930), *C A* 24, 1599 (1930)

(53) Long, through Reference No 80

(54) Lyden, R , Thallium iodides, ' *Finska Kemistsamfundets Medd* 41 34-53 (1932), *C A* , 26, 5509 (1932)

(55) Mach, F, and Lepper, W , Über die Bestimmung des Thalliums in Mausegift preparaten " *Z anal chem* , 68, 36-45 (1926)

(56) Marino *Ges chim ital* , 38, 55 (1907)

(57) Marne, W Researches on thallium," *Brit med chir rev* , 41, 254-256 (1868)

(58) Marshall through Reference No 80

(59) Mellor, J W , Comprehensive treatise on inorganic and theoretical chemistry " 5, 406-479 (1924)

(60) Menzies, R Ch Die Anwendung von Thalliumverbindungen in der organischen Chemie " *J chem soc* 129, 1571-1573 (1930), through *Jahr Pharm* , 65, 105 (1930)

(61) Migliacci D, and Crapetta C Contribution to qualitative chemical analysis in the dry way, ' *Ann chim appl* , 17 66-74 (1927), *C A* 21 2233 (1927)

(62) Moser, L and Brukl A , Determination of thallium as chromate " *Monatsh* , 47, 667-683 (1926), through *Analyst* , 52, 459 (1928)

(63) Moser, L, and Brukl, A Determination and separation of rare metals from other metals VIII Determination of thallium as thallous (1) chromate and its separation from other metals," *Monatsh* , 47, 709-725 (1927), *C A* , 21, 3850 (1927)

(64) Moser L , and Neusser, E , ' Determination of metal sulphide by heating in H₂S," *Chem-Ztg* , 541-543, 581-582 (1923), *C A* , 17, 3004 (1923)

(65) Moser, L, and Reis, W , Determination and separation of rare metals from other metals " *Monatsh* , 52, 343-350 (1929), *C A* , 24, 567 (1930)

(66) Moser, L , and Reis, W , Die Mikroanalytische Bestimmung des Thalliums und des Bleies," *Mikrochem Festschr Friedr Ensch* , 215-218 (1920)

- (67) Munch, James C, "Recent developments in the preparation and uses of thallium," *Foote Prints*, 6, 1-21 (June 1933)
- (68) Munch James C, Ginsburg, H M, and Nixon, C E, "The 1932 thallototoxicosis outbreak in California," *J A M A*, 100, 1315-1319 (1933)
- (69) Munch, James C, and Silver, James, The pharmacology of thallium and its use in rodent control," *Tech Bulletin No 238*, U S Dept of Agriculture (April 1931)
- (70) Nietzsche, R, "Precipitation of thallium," *Arch pharm* 385 (Nov 1875), through *Proc A Ph A*, 24, 265 (1876)
- (71) Noyes, A A, Bray, W C, and Spear E B, 'A system of qualitative analysis for the common elements Part III Analysis of the aluminum and iron groups, including beryllium, uranium, vanadium, titanium, zirconium and thallium' *J am chem soc*, 30, 481-563 (1908)
- (72) Olmer, D, and Tian, A, Intoxication par l'acetate du thallium Presence de thallium dans le liquide cephalo rachidien," *Compt rend soc biol*, 65 742-743 (1908)
- (73) Papish J, 'Flame reactions of thallium,' *Proc Indiana acad sci* 166-169 (1918)
- (74) Pavelka F, and Morth, H, Eine Schnellmethode zur Bestimmung kleiner Mengen von Thallium neben Blei und Wismut," *Mikrochemie*, 2, 30-33 (1932)
- (75) Picon, C R 'Obtention et proprietes du thiocarbonate thalleux Reaction specifique du thallium," *Compt rend acad sci* 195, 1274-1276 (1932)
- (76) Proszk, J, "Über die massanalytische Bestimmung geringer Mengen von Thallium," *Z anal chem*, 73, 401-404 (1928)
- (76a) Rienacker G, and Schiff, W 'Qualitative analysis with small quantities of minerals IV," *Centr mineral geol*, 56-60 (1934), *C A*, 28, 2294 (1934)
- (77) Rosenthaler, L, Kristallfällung des Saccharins mit Thalliumazetat " *Pharm zentr*, 74, 290 (1933)
- (78) Rother, E and Zander, G, Volumetric determination of certain rare metals by means of visual conductivity titration," *Z angew chem*, 43 930-933 (1930), *C A*, 25 52 (1931)
- (79) Roussanov, A, 'Recherche spectroscopique du thallium, du cadmium et de l'indium," *Chim et Ind*, 28, 295 (1932)
- (80) Rudisüle, Nachweis, Bestimmung und Trennung der Chemischen Elemente " 6, 903-936 (1923)
- (81) Rupp E, 'Iodometric estimation of thallium," *Zeit anorg chem* 33 156 (1904), through *Proc A Ph A*, 52, 815 (1904)
- (82) Schee, J, 'The detection of thallium in the organs of small animals which have been poisoned with Zehowizen," *Beitr ger med*, 7, 14-31 (1928) *C A* 23, 1840 (1929)
- (83) Schöenbein, through Reference No 59
- (84) Schwarzacher, W, 'Ueber Thalliumvergiftung," *Münch med wochschr*, 33 1430 (1930)
- (85) Shaw, P A, "Colorimetric determination of thallium," *Ind Eng Chem* 5, 93-95 (1933)
- (86) Smith, G F, Ceric sulphate The use of standard ceric sulphate as modern analytical chemistry's most recently developed widely applicable oxidizing agent," 1 (July 1933)
- (87) Soule, S, 'Gravimetric determination of the thallium radical as thallous iodide," *Chemist Analyst*, 17, 4 (July 1928)
- (88) Spencer, J F, and LePla, M, Quantitative separation of thallium from silver " *Proc chem soc*, 24, 75 (1908)
- (89) Sponholz, *Z anal chem*, 31, 519 (1892), through Reference No 103
- (90) Streckler, W, and de la Pena, P, "Determination of thallium " *Z anal chem*, 67, 256-269 (1925), *C A*, 20, 1041 (1926)
- (91) Steenhauer, A J, "Detection of thallium," *Mikrochem Pregl Festschr* 315-318 (1929)
- (92) Stich, C, Colorimetric estimation of thallium," *Pharm Ztg* 14, 27-29 (1929) *C A* 23 1590 (1929)

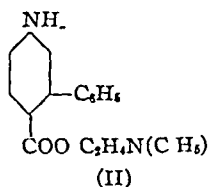
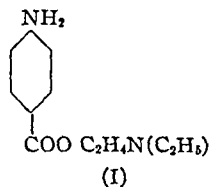
- (93) Tamm I K, "The reaction between thallic chloride and potassium thiocyanate," *J chem soc*, 130, 2433-2435 (1931)
- (94) Tananaev, N A, "Detection of cesium, rubidium and thallium by spot tests" *Z anal chem*, 88, 343-347 (1932), *C A*, 26, 4271 (1932)
- (95) Tanatar S, and Petrov, S, "A new reagent for thallium," *J Russ Phys Chem Soc*, 42 94-95 (1910), *C A*, 4, 1036 (1910)
- (96) Thomas V "Researches on thallium," *Ann chim phys*, 11, 204-262 (1908)
- (97) Thomas V, "Chimie Minerale Dosage du Thallium" *Compt rend acad sci*, 130 1316-1319 (1900)
- (98) Thomas V, "Dosage volumetrique du thallium," *Compt rend acad sci*, 134, 655-660 (1902)
- (99) Timm, *Deut ger med* 18, 73 (1932), through Reference No 41
- (100) Troitzkii M V "Argentometric determination of thallium," *J Gen Chem (U S S R)*, 1, 1083-1085 (1931), *C A* 26 4008 (1932)
- (101) Troitzkii M V "Determination of thallium with hypoiodite" *J Gen Chem (U S S R)* 1 1086-1088 (1931) *C A* 26 4008 (1932)
- (102) Werther "Thallium—quantitative analysis" *Zett anal chem*, 3 2 (1864), 4, 113 (1865) *Proc A Phil A*, 13 121 (1865)
- (103) Willard H H and Young P "Ceric sulphate as a volumetric oxidizing agent X The determination of thallium" *J am chem soc*, 52 36-42 (1930)
- (104) Willm, *Bull soc chim (Paris)* 5, 352 (1863)
- (105) Willm *Ann chim phys* 5 63 (1865)
- (106) Zintl, E and Rieckel G, "Titrimetric determination of thallium," *Z anorg allgem chem*, 153 276-280 (1926), *C A*, 20, 2631 (1926)

LOCAL ANESTHETICS—PHENYL PROCAINE *

BY W BRAKER AND W G CHRISTIANSEN ¹

This investigation concerns the study of phenyl derivatives of procaine (I) and its analogues. The study was initiated by the comparatively greater activity and lesser toxicity of *o*-phenyl phenol over phenol. The substitution of a phenyl group on the benzene nucleus of procaine would yield, it was expected, a substance of greater potency and lesser toxicity than the parent substance. A summary of the biological activity of the various substances prepared is contained below.

The initial substance synthesized was phenyl procaine (II). The details of the preparation of (II) are stated in the experimental section. Essentially, the



synthesis employed was the preparation of 2-carboxy 5-amino diphenyl and the subsequent reaction of its sodium salt with β -diethylamino ethyl chloride. Phenyl procaine is an active anesthetic but due to such factors as precipitation upon the addi-

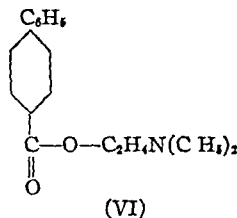
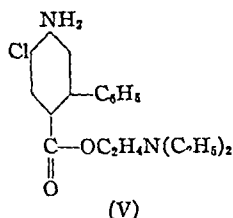
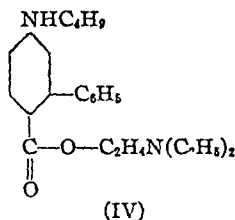
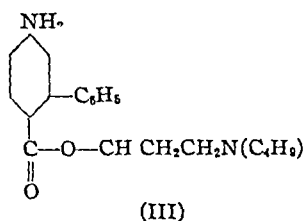
* Section on Practical Pharmacy and Dispensing, Madison meeting 1933

¹ Research Department of the Chemical and Pharmaceutical Laboratories, E R Squibb and Sons Brooklyn N Y

tion of buffers and irritation in corneal and intradermal tests, the compound does not appear to be of value

Analogues of phenyl procaine were synthesized for the purpose of

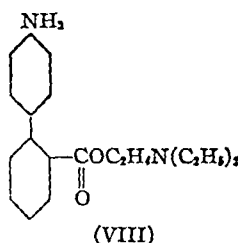
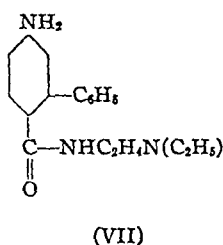
- (1) Determining the effect of increasing the size of the dialkylamino alkyl group (III)
- (2) Ascertaining the effect of alkylating the amino group (IV)
- (3) Investigating the effect of halogenation, as depicted by (V)
- (4) Observing the effect of the elimination of the amino group (VI)



The hydrochlorides of the above compounds were either too acid for testing (IV and VI) or too inactive (III and V) to warrant any further investigation

A compound containing a β -diethylamino ethyl carbamido group (VII) which is present in percaine was also prepared but was comparatively inactive

The effect of shifting the amino group from the 5- to the 4'-position was also studied. However, an aqueous solution of the hydrochloride of this substance (VIII) was comparatively inactive



EXPERIMENTAL

2-p Toluenesulphonamidodiphenyl (1)—Prepared from 2 amino diphenyl and *p* toluene sulphon chloride M p, 96° C

5 Nitro 2 p Toluenesulphonamidodiphenyl (2)—Prepared by nitration of 2 *p* toluenesulphonamido diphenyl M p 168–169° C

2 Amino 5-Nitro Diphenyl (3)—Prepared by hydrolysis of 2 *p* toluenesulphonamido 5-nitro diphenyl with concentrated sulphuric acid M p 123–125° C

2-Cyano 5 Nitro Diphenyl—The best procedure for the preparation of the substance requires diazotization of 2 amino 5 nitro diphenyl in concentrated hydrochloric acid. Diazotization in dilute hydrochloric acid and subsequent substitution of the diazonium group leads to a reduced yield

Fifty Gm of 2-amino-5-nitro diphenyl was suspended in 130 cc of concentrated hydrochloric acid and was diazotized with 21.5 Gm of sodium nitrite contained in 70 cc of water. The diazonium solution is then added at -10° to 0° C to a solution of potassium copper cyanide which had been prepared by adding 120 Gm of potassium cyanide in 250 cc of water to 100 Gm of crystalline copper sulphate contained in 250 cc of water. The addition of the diazonium solution was made over a period of 30 minutes using stirring. The suspension thus obtained was stirred at 0° C for one hour when the temperature was slowly raised to 20° C and held at the latter temperature for $\frac{1}{2}$ hour. The suspension was then slowly heated to 90° C and kept at this temperature for 3 hours. The reaction mixture was carefully alkalinized with 150 cc of 40% sodium hydroxide. A brown precipitate was obtained which was filtered off, washed with water and dried *in vacuo*. The substance was twice recrystallized from alcohol.

Yield, 43 Gm of small needle like brown crystals —80%

Melting point, $131-133^{\circ}$ C

Assay—Nitrogen found, 11.90%

Calculated for $C_{13}H_9O_2N$, 12.50%

2-Carboxy 5 Nitro Diphenyl—This substance was obtained by hydrolysis of 2-cyano-5-nitro diphenyl.

Five and two tenths Gm of the cyano compound was suspended in a mixture of 75 cc of glacial acetic acid, 60 cc of sulphuric acid and 50 cc of water and refluxed for 8 hours. The mixture was then cooled and diluted with an equal volume of water. The white crystals obtained were filtered, washed with water and dried *in vacuo*.

Yield, 3.5 Gm, 62%

Assay—Nitrogen found, 5.78%

Calculated for $C_{13}H_7O_4N$, 5.76%

2-Carboxy 5-Amino Diphenyl Hydrochloride—Three Gm of 2-carboxy-5-nitro diphenyl was reduced with 10 Gm of tin and 50 cc of hydrochloric acid. The reduction was carried on for 3 hours, the solution was then diluted with water and the tin precipitated with hydrogen sulphide. The sulphide was filtered off and the filtrate was concentrated. When cooled the solution deposited 2-carboxy-5-amino diphenyl hydrochloride as silvery plates.

Yield, 1.3 Gm

Melting point, 230° C

Analysis—Nitrogen found, 5.42%

Calculated for $C_{13}H_{12}O_2NCl$, 5.61%

2- β Diethylamino Carbethoxy 5-Amino Diphenyl—One and two tenths Gm of 2-carboxy-5-amino diphenyl hydrochloride was dissolved in 20 cc of absolute alcohol and a solution of 0.22 Gm of sodium in 20 cc of alcohol was added. The sodium chloride which precipitated was removed by filtration and 1.0 Gm of β diethylamino ethyl chloride in 10 cc of alcohol was added to the filtrate, this alcoholic solution was refluxed for 7 hours. The solvent was then removed by distillation *in vacuo*. The residue was a light yellow oil which was converted to its dihydrochloride by passing dry hydrochloric acid gas into its ethereal solution. A yellow oil separated which, after pouring off the ether, was heated in an oven at 100° C for 2 hours. It was then placed in a vacuum desiccator over calcium chloride and sodium hydroxide. The dihydrochloride thus obtained was a yellowish white substance which was hygroscopic.

Analysis—Nitrogen found 7.29%

Calculated for $C_{19}H_{20}N_2O_2Cl$, 7.27%

Chlorine found 18.34%

Calculated for $C_{19}H_{20}N_2O_2Cl$, 18.44%

The borate of the base was obtained by evaporating to dryness an aqueous solution of 1.6 Gm boric acid and 1.1 Gm of base. A yellowish white powder was obtained.

Analysis—Nitrogen found, 4.87%

Calculated for $C_{19}H_{20}O_{17}B_4N_2$, 4.51%

2 Di *n*-Butylamino Carbopropoxy 5 Amino Diphenyl—One and one tenth Gm of 2-carboxy 5 amino diphenyl hydrochloride was dissolved in 20 cc of absolute alcohol and a solution of 0.2 Gm of sodium in 20 cc of alcohol was added. The sodium chloride formed was filtered off. The filtrate was added to a solution of 0.92 Gm of di *n* butylamino propyl chloride in 30 cc of alcohol. The solution was refluxed for 7 hours after which the sodium chloride formed was filtered off and the filtrate was distilled *in vacuo* to remove the solvent. The residue was a dark brown oil which was 2 di *n* butylamino carbopropoxy 5 amino diphenyl.

Analysis—Nitrogen found, 6.97%
Calculated for $C_{21}H_{24}O_2N_2$, 7.33%

The dihydrochloride was obtained by evaporating an alcoholic hydrochloric acid solution of the base *in vacuo*. It was a dark brown, brittle substance.

Analysis—Chlorine found, 15.94%
Calculated for $C_{21}H_{26}O_2N_2Cl_2$, 15.71%

2-Phenyl 4 Amino Benzoyl Chloride—Two and seven tenths Gm of 2-carboxy 5 amino diphenyl was dissolved in 30 cc of benzene and 5.0 Gm of thionyl chloride was added. The solution was refluxed for 3 hours after which the benzene and excess thionyl chloride were removed by distillation *in vacuo*, leaving an oily residue. The latter was distilled at 2–3 mm at which pressure 2 phenyl 4 amino benzoyl chloride distilled at 175–183° C. It was a yellow oil.

Yield, 2.5 Gm
Analysis—Chlorine found 15.49%
Calculated for $C_{13}H_{10}ONCl$, 15.33%

2 β Diethylamino Ethyl Carbamido 5-Amino Diphenyl Hydrochloride—Three and four-tenths Gm of 2 phenyl 4-amino benzoyl chloride was dissolved in 30 cc of dry benzene and reacted with 2.0 Gm (20% excess) of unsymmetrical diethylethylene diamine contained in 25 cc of benzene. The reaction mixture warmed up rapidly, it was refluxed for 3 hours. A solid separated out during refluxing. The isolation was made by pouring off the benzene from this solid and dissolving the latter in dilute hydrochloric acid. The acid solution was decolorized with charcoal and was evaporated to dryness *in vacuo*. The product was an extremely hygroscopic dark brown solid.

Analysis—Nitrogen found, 12.45%
Calculated for $C_{19}H_{16}N_2OCl$, 12.09%
Chlorine found, 10.84%
Calculated for $C_{19}H_{16}N_2OCl$, 10.23%

A borate was also prepared, it also was hygroscopic and was not further investigated.

2-Carboxy 5 Butylamino Diphenyl—Two and two-tenths Gm of 2 carboxy 5-amino diphenyl was dissolved in 10 cc of toluene and refluxed with 1.5 Gm of *n* butyl bromide. After 6 hours the toluene and excess butyl bromide were removed by distillation *in vacuo*. An alcoholic solution of the residual semi solid substance was decolorized with charcoal and evaporated to dryness. The residue was a brown semi solid.

Analysis—Nitrogen found 4.96%
Calculated for $C_{17}H_{19}O_2N$, 5.20%

2- β -Diethylamino Carbethoxy 5-Butylamino Diphenyl—2.35 Gm of 2 carboxy 5 butylamino diphenyl was dissolved in 25 cc of absolute alcohol and a solution of 0.22 Gm of sodium in 12 cc of alcohol was added followed by 2 Gm of β diethylamino ethyl chloride in 10 cc of alcohol. The solution was refluxed for 7 hours and then filtered from sodium chloride. The filtrate was decolorized with charcoal and 1 mol of hydrochloric acid was added. By evaporating the solution to dryness *in vacuo* the mono hydrochloride was obtained as a dark brown brittle substance.

Analysis—Nitrogen found, 6.56%
 Calculated for $C_{22}H_{23}N O_2Cl$, 6.92%
 Chlorine found, 8.90%
 Calculated for $C_{22}H_{23}N_2O_2Cl$, 8.78%

2-Carboxy 4 Chlor 5 Amino Diphenyl Hydrochloride—Two and two tenths Gm of 2 carboxy 5 amino diphenyl hydrochloride was dissolved in 25 cc of glacial acetic acid and then 1.8 Gm of sulphuryl chloride was added. The solution was allowed to remain at 25° C for 2 hours after which the acetic acid was removed by distilling *in vacuo*. The last traces of acetic acid were removed by heating with alcohol and subsequently distilling. The residue was a light brown solid.

Analysis—Chlorine found 25.39%
 Calculated for $C_{17}H_{10}O Cl N$, 25.08%

A portion of this substance was oxidized with alkaline permanganate solution. A small quantity of benzoic acid was isolated and identified by melting point. This indicated that the position of the chlorine atom was in the substituted benzene nucleus.

2 β Diethylamino Carbethoxy 1 Chlor 5 Amino Diphenyl Dihydrochloride—One and three tenths Gm of the sodium salt of 2 carboxy 4 chlor 5 amino diphenyl was refluxed with 1.2 Gm of β diethylamino ethyl chloride in alcohol for 5 hours. The isolation was made as in the preparation of 2 β diethylamino carbethoxy 5 amino diphenyl. A light yellow oil was obtained which was converted to its dihydrochloride by evaporating its alcoholic-hydrochloric acid solution to dryness *in vacuo*. A brown hygroscopic substance was obtained.

Analysis—Nitrogen found 7.08%
 Calculated for $C_{19}H_{21}N O Cl_2$, 6.67%
 Chlorine found, 16.22%
 Hydrochloride chlorine calculated for $C_{19}H_{21}N O Cl_2$, 16.92%

2 Cyano 4' Nitro Diphenyl—The substance was prepared by the same procedure used for 2 cyano 5 nitro diphenyl. A dark brown substance was obtained in a 30% yield.

Analysis—Nitrogen found 11.93%
 Calculated for $C_{13}H_9N O$, 12.50%

2 Carboxy 4'-Nitro Diphenyl—This substance was prepared by the hydrolysis of 2-cyano 4'-nitro diphenyl by the same procedure used for hydrolyzing 2 cyano 5 nitro diphenyl. A dark brown substance was isolated in a 54% yield.

Analysis—Nitrogen found 5.93%
 Calculated for $C_{13}H_9O_2N$, 5.76%

2-Carboxy 4'-Amino Diphenyl Hydrochloride—This was prepared by reduction of 2 carboxy 4' nitro diphenyl by tin and hydrochloric acid. A dark brown, feathery substance was obtained.

Analysis—Nitrogen found 5.38%
 Calculated for $C_{13}H_9 O NCl$, 5.61%

2 β Diethylamino Carbethoxy 4'-Amino Diphenyl Dihydrochloride—The method employed was identical with that used in the preparation of 2 β diethylamino carbethoxy 5 amino diphenyl dihydrochloride. A dark brown semi solid substance was obtained.

Analysis—Nitrogen found, 7.70%
 Calculated for $C_{19}H_{21}O N_2Cl_2$, 7.27%
 Chlorine found, 18.48%
 Calculated for $C_{19}H_{21}O_2N_2Cl$, 18.44%

4 Cyano Diphenyl (4)—The substance was prepared according to Kaiser's method (5) M p 79° C

4 Carboxy Diphenyl (6) —The hydrolysis of 4 cyano diphenyl yielded the substance
M p 220° C

4 β Diethylamino Carbethoxy Diphenyl Hydrochloride —This substance was obtained by refluxing sodium *p* phenyl benzoate with diethylamino ethyl chloride and subsequently covering the base to its hydrochloride by methods mentioned above

Analysis—Chlorine found, 10.29%

Calculated for $C_{19}H_{21}O_2NCl$, 10.64%

Anesthetics Tests —The biological results have indicated that phenyl procaine is considerably more active than cocaine hydrochloride and novocaine. This fact is borne out by the following table denoting the concentrations required for equivalent duration of anesthesia by intradermal injection into guinea pigs

TABLE I

Duration of Anesthesia	Required Concentration of the Phenyl Procaine	Concentration of the Cocaine Dihydrochloride	Procaine
50 Minutes	0.73%	1.01%	2.1%
35 Minutes	0.40%	0.52%	1.0%

Phenyl procaine hydrochloride was also more active on the rabbit's cornea although it was slightly irritating

The biological tests on compounds reported herein were made in the Biological Research Laboratories of E. R. Squibb and Sons and we gratefully acknowledge their assistance

SUMMARY

In a series of phenyl derivatives of procaine the most active is the hydrochloride of β -diethylamino ethyl 2-phenyl 4-amino benzoate

REFERENCES

- (1) Bell *J Chem Soc* 2774 (1928)
- (2) Bell, *Ibid*
- (3) Bell, *Ibid*
- (4) Kaiser *Annalen*, 257 100 (1890)
- (5) Kaiser, *Ibid*
- (6) Kaiser, *Ibid*

ACYL DERIVATIVES OF ORTHO-AMINOPHENOL *

BY C. B. POLLARD AND W. T. FORSEE, JR

When diacyl derivatives of *o*-aminophenol were prepared by the usual methods, it was found in many cases that the order of introduction of the two different acyl groups has no influence upon the formation of the diacyl, identical products being isolated from the two acylations. The formation of identical rather than isomeric products on reversing the order of acylation indicated that during acylation a rearrangement must have occurred in one of the two cases. The positions of the acyl groups of the molecule were determined by removing the group attached to the oxygen by saponification with dilute alkali, and determining from the physical constants of the remaining monoacylated product the group attached to the nitrogen. The formation of isomeric diacyls and the production of the same

* Contribution from the Chemical Laboratories, College of Pharmacy, University of Florida

saponification product indicates that a rearrangement must have occurred during saponification

Considerable experimental evidence has indicated that certain acyl groups have more influence than others in bringing about this migration, weight and the acidity of the groups being considered to have the predominating influence in their obtaining a position in the more basic amino group

Previous work on this subject by Ransom (1), Ransom and Nelson (2), Nelson and others (3, 4, 5, 6, 7), Raiford and others (8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18) and Bell (19, 20) is discussed in the literature

The work of Pollard and others (21, 22) using one particular acyl chloride as one of the acylating agents in each diacyl throughout each series of experiments, indicated that relative acidity and weight of the acyl groups are not the controlling factors in this type of rearrangement

This investigation was carried out in order to study further the effect of these factors on rearrangement The acylating agent, *o*-*n*-heptanoyl chloride, was kept constant throughout the series This selection afforded a heavy group and one which was less acidic than any group against which it was introduced Diacyls were prepared by introducing the heptanoyl group against the *n*-butyryl, *n*-valeryl, *n*-caproyl, phenylacetyl and hydrocinnamyl groups

Regardless of the order of introduction, the *n*-heptanoyl and *n*-valeryl groups produced diacyls whose melting points and mixed melting points indicated that one or both of the compounds was a mixture of the two possible isomers Saponification of each of these diacyls yielded only *o*-*n*-heptanoylaminophenol, indicating in one case the migration of the *n*-heptanoyl group from the oxygen to the nitrogen Similar results were obtained with diacyls in which the acylating groups were *n*-heptanoyl and *n*-caproyl The acylation and saponification of these isomers involved rearrangements in which the *n*-heptanoyl group replaced the lighter and more acidic *n*-valeryl and *n*-caproyl groups

o-*n*-Heptanoylaminophenol acylated with *n*-butyryl chloride gave a compound which was distinctly different from that obtained by the acylation of *o*-*n*-butyrylaminophenol with *n*-heptanoyl chloride However, both isomeric diacyls yielded the same saponification product, *o*-*n*-heptanoylaminophenol Similar results were obtained with diacyls in which the acylating groups were *n*-heptanoyl and phenylacetyl The saponification of these isomers involved rearrangements in which the *n*-heptanoyl group replaced the lighter and more acidic *n*-butyryl group and the heavier and more acidic phenylacetyl group

Introduction of the *n*-heptanoyl and hydrocinnamyl groups resulted in the production of the equilibrium mixtures of the two possible diacyls regardless of the order of introduction Saponification in each case, also gave mixtures composed of approximately 50% of each of the possible monoacyls, showing that a partial rearrangement had occurred in each case

EXPERIMENTAL

o *n* Heptanoylaminophenol and *o* *n* caproylaminophenol were prepared by the method of Groenvik (23) using *o* aminophenol and the acid chloride in an anhydrous ether solution Their properties are summarized in Table I The other monoacyls used which have been previously described, were made by the same method

TABLE I—PROPERTIES OF MONOACYLS

	1	2
Name	<i>o n</i> -Heptanoylaminophenol	<i>o n</i> -Caproylaminophenol
Formula	$C_6H_{13}CONHC_6H_4OH$	$C_6H_{11}CONHC_6H_4OH$
M p, °C	85 5-86 5	80 0-80 5
Yield, %	96 00	95 00
N, % calculated	6 33	6 76
N, % found	6 18	6 76
C, % calculated	70 56	69 51
C, % found	70 64	69 46

o n-Heptanoylaminophenyl *n*-valerate ($C_6H_{13}CONHC_6H_4OCOC_4H_9$)—To 5 Gm of *o n*-heptanoylaminophenol was added 27 Gm of *n*-valeryl chloride. After the addition of 2 drops of concentrated sulphuric acid the mixture was heated on a water-bath for 5 hours. A yellow oil was formed. The product was washed thoroughly with hot water and, after repeated recrystallization from hot 80% alcohol and cooling in an ice salt bath, it solidified in white crystals melting at 37.5-38.5°.

About 0.5 Gm of this compound was saponified with a small quantity of a 10% potassium hydroxide solution. After complete solution had taken place, the mixture was filtered, cooled and acidified with dilute hydrochloric acid. White crystals separated. This product was filtered, washed with water and recrystallized from dilute alcohol. A mixed melting point of this product with *o n*-heptanoylaminophenol showed the two compounds to be identical.

Compounds listed in Table II as 2, 3, 4, 7 and 8 were prepared by this method which is a modification of that of Jacobs, Heideberger and Rolf (24).

o n-Heptanoylaminophenyl *n*-butyrate ($C_6H_{13}CONHC_6H_4OCOC_4H_7$)—A mixture of 5 Gm of *o n*-heptanoylaminophenol, 2.5 Gm of *n*-butyryl chloride and 2 drops of concentrated sulphuric acid was placed in an anhydrous ether solution and refluxed on a water bath for 2 hours. After evaporation of the ether, a pale yellow oil remained. This was thoroughly washed with hot water and, after cooling in an ice bath, the product solidified. It was recrystallized four times from hot 80% alcohol, being deposited in white crystals, m p 41.5-42.5°.

The compound listed in Table II as 6 was also prepared by this method. All diacyls were saponified in approximately the same manner as previously described.

o n-Heptanoylaminophenyl hydrocinnamate ($C_6H_{13}CONHC_6H_4OCOCH_2CH_2C_6H_5$)—An excess (6 Gm) of hydrocinnamyl chloride was added to a pyridine solution of 6.6 Gm of *o n*-heptanoylaminophenol. The mixture was refluxed on a water bath for 4 hours. After allowing to stand over night, the mixture was diluted with several volumes of water. A red oil separated. This was filtered and washed thoroughly with a very dilute hydrochloric acid solution. The remaining oil was then washed with a 5% solution of ammonium carbonate. After thoroughly washing with hot water, the only product was dissolved in a minimum quantity of hot 80% alcohol and allowed to crystallize in an ice salt bath. Red-brown crystals separated. After several such recrystallizations, a cream-colored product was deposited which melted at 47-50° C.

The compound listed in Table II as 10 was also prepared by this method which is that of Einhorn and Hollandt (25).

TABLE II—DIACYL DERIVATIVES OF *o*-AMINOPHENOL

Name	Formula
1 <i>o n</i> -Heptanoylaminophenyl <i>n</i> -valerate	$C_6H_{13}CONHC_6H_4OCOC_4H_9$
2 <i>o n</i> -Valerylaminophenyl <i>n</i> -heptanoate	$C_6H_9CONHC_6H_4OCOC_6H_{13}$
3 <i>o n</i> -Heptanoylaminophenyl <i>n</i> -caproate	$C_6H_{13}CONHC_6H_4OCOC_6H_{11}$
4 <i>o n</i> -Caproylaminophenyl <i>n</i> -heptanoate	$C_6H_{11}CONHC_6H_4OCOC_6H_{13}$
5 <i>o n</i> -Heptanoylaminophenyl <i>n</i> -butyrate	$C_6H_{13}CONHC_6H_4OCOC_4H_7$
6 <i>o n</i> -Butyrylaminophenyl <i>n</i> -heptanoate	$C_6H_7CONHC_6H_4OCOC_6H_{13}$
7 <i>o n</i> -Heptanoylaminophenyl phenylacetate	$C_6H_{13}CONHC_6H_4OCOCH_2C_6H_5$
8 <i>o</i> -Phenylacetylaminophenyl <i>n</i> -heptanoate	$C_6H_5CH_2CONHC_6H_4OCOC_6H_{13}$
9 <i>o n</i> -Heptanoylaminophenyl hydrocinnamate	$C_6H_{13}CONHC_6H_4OCOCH_2CH_2C_6H_5$
10 <i>o</i> -Hydrocinnamylaminophenyl <i>n</i> -heptanoate	$C_6H_5CH_2CH_2CONHC_6H_4OCOC_6H_{13}$

	M P ° C	Yield %	Analysis N		Analysis C	
			Calcd	% Found	Calcd	% Found
1	38-39	15	4 58	4 38	70 76	70 28
2	43 5-45	25	4 58	4 41	70 76	70 33
3	37-38	20	4 38	4 30	71 42	71 61
4	41-42 5	20	4 38	4 25	71 42	71 75
5	41 5-42 5	61	4 80	4 56	70 05	70 01
6	32 5-33 5	27	4 80	4 54	70 05	69 82
7	69-69 5	44	4 12	3 87	74 29	74 08
8	83-85	31	4 12	4 16	74 29	74 35
9	47-50	62	3 96	3 73	74 74	74 85
10	54-56 5	55	3 96	3 69	74 74	74 55

Saponification Product

1	$C_6H_{11}CONHC_6H_4OH$	7	$C_6H_{11}CONHC_6H_4OH$
2	$C_6H_{11}CONHC_6H_4OH$	8	$C_6H_{11}CONHC_6H_4OH$
3	$C_6H_{11}CONHC_6H_4OH$	9	50% $C_6H_{11}CONHC_6H_4OH$
4	$C_6H_{11}CONHC_6H_4OH$		50% $C_6H_7CH_2CH CONHC_6H_4OH$
5	$C_6H_{11}CONHC_6H_4OH$	10	50% $C_6H_{11}CONHC_6H_4OH$
6	$C_6H_{11}CONHC_6H_4OH$		50% $C_6H_7CH_2CH CONHC_6H_4OH$

The melting points in the cases of three pairs of isomers listed in Table II as 1, 2, 3, 4, 9 and 10 might indicate that in each case they were identical substances in an impure state, but analysis and mixed melting points seem to indicate that each might be an equilibrium mixture of the two possible isomeric diacyls

Mixed melting point of 1 and 2	38-40°
Mixed melting point of 3 and 4	37-39°
Mixed melting point of 9 and 10	50-54°

All the diacyls prepared are insoluble in water, soluble in alcohol and very soluble in ether

SUMMARY

A study of the diacyl derivatives of *o* aminophenol, when one of the acyl groups was always the *n*-heptanoyl radical, has been made. The *n*-heptanoyl group was checked against the *n*-butyryl, *n*-valeryl, *n*-caproyl, phenylacetyl and hydrocinnamyl groups

Apparently relative weight and acidity are not the controlling factors in this type of rearrangement. When complete rearrangement did occur, the nitrogen atom was shown after saponification to be attached to the heavier and less acidic group in three cases and to the lighter and less acidic group in one case. One case showed only partial rearrangement. In this case saponification products showed part of the nitrogen to be attached to the heavier and more acidic group while the remainder of the nitrogen was attached to the lighter and less acidic group.

Two monoacyls and ten diacyl derivatives of *o*-aminophenol have been prepared, isolated and studied.

Some of these compounds are being studied for antiseptic and physiological effects. The results of this investigation will be published at a later date.

REFERENCES

- | | |
|---|---|
| (1) <i>Am Chem J</i> , 23 1 (1900) | (14) <i>Ibid</i> , 46, 2246 (1924) |
| (2) <i>J Am Chem Soc</i> , 36, 390 (1914) | (15) <i>Ibid</i> , 46, 2305 (1924) |
| (3) <i>Ibid</i> , 48, 1677 (1926) | (16) <i>Ibid</i> , 47 1111 (1925) |
| (4) <i>Ibid</i> , 48 1680 (1926) | (17) <i>Ibid</i> , 47, 1454 (1925) |
| (5) <i>Ibid</i> , 49, 3129 (1927) | (18) <i>Ibid</i> , 48 483 (1926) |
| (6) <i>Ibid</i> , 50 919 (1928) | (19) <i>J Chem Soc</i> 1981 (1930) |
| (7) <i>Ibid</i> , 51, 2761 (1929) | (20) <i>Ibid</i> , 2962 (1931) |
| (8) <i>Ibid</i> , 41, 2168 (1919) | (21) <i>J Am Chem Soc</i> , 53, 996 (1931) |
| (9) <i>Ibid</i> , 44, 1792 (1922) | (22) <i>Ibid</i> , 54, 3283 (1932) |
| (10) <i>Ibid</i> , 45 469 (1923) | (23) <i>Bull soc chim</i> [2], 25, 177 (1876) |
| (11) <i>Ibid</i> , 45, 1738 (1923) | (24) <i>J Am Chem Soc</i> , 41, 458 (1919) |
| (12) <i>Ibid</i> , 46, 430 (1924) | (25) <i>Ann</i> , 301, 101 (1898) |
| (13) <i>Ibid</i> 46, 2051 (1924) | |

THE POTENCY OF OREGON DIGITALIS *¹

(A PRELIMINARY INVESTIGATION)

BY DONALD KUO-CHIH LEE AND ERNST T. STUHR²

INTRODUCTION

The literature reveals considerable conflicting evidence relative to physiological activity of cultivated and wild growing foxglove (1, 2, 3, 4, 5, 6, 7, 8, 9) and age of the foliage (10, 11). These contradictions prompted the investigation of the native growing Oregon plants.

Foxglove grows wild throughout the Pacific slope region from Vancouver Island to California. In Oregon it is abundant along the western part of the state, but more especially in Lincoln and Coos counties.

The results here presented are from a seasonal study of wild growing Oregon digitalis, *Digitalis purpurea* L.

Procedure—Monthly collections were made of both first- and second-year leaves during the spring and summer of 1932–1933. Tinctures were prepared in accordance with U. S. P. specifications. The fat-free preparations were placed in glass-stoppered amber-colored bottles and stored in a cool place in order to retard deterioration (12, 13, 14).

The resulting preparations were biologically assayed by the official "one-hour" frog method (15). Throughout the experiments only healthy frogs of the species *Rana pipiens* (common "grass" or "leopard" frogs) weighing 20–35 Gm. were used. Temperature was kept constant (20° C). The degree of sensitiveness of the frogs was ascertained, using ouabain solution as a standard. Series of standardized frogs were used in assaying the respective tinctures for each particular age and month's collection of digitalis leaves.

An attempt was made to correlate physiological activity with seasonal glucosidal content by the proposed colorimetric method of Knudsen and Dresbach (16).

* An abstract based upon a thesis by Donald Kuo Chih Lee submitted to the Graduate Faculty of the Oregon State College in partial fulfillment of the requirements for the degree of Master of Science.

¹ Scientific Section, A. P. H. A. Madison meeting 1933.

² Department of Pharmacology and Pharmacognosy, Oregon State College, Corvallis.

Results—The seasonal study of wild growing digitalis revealed that the first-year leaves of the December collection were equivalent in potency to the April collection of first-year leaves

FIRST YEAR PLANTS

Collections	*Relative Potency of Preparations (Tr Dilution 1 : 5)
November	38.46
April	38.46
June	85.71

SECOND YEAR PLANTS

November	30.00
June	85.71
July	100.00

* Determined by comparison with ouabain as standard (Dilution—1:10,000). Apparently there is very little difference in the physiological activity of the first- and second year plants during June.

CHEMICAL ASSAY

A chemical determination of the active principles was attempted on the monthly samples. The method used was the colorimetric method proposed by Knudsen and Dresbach (16).

Tinctures Tested	Readings in Mm	Number of Mg. in a Cat Unit (17)
November		
First year plants	38	190
Second year plants	42	210
December		
First year plants	31	155
April		
First year plants	33.2	166
June		
First year plants	24.0	120
Second year plants	26.3	131.5
July		
First year plants	20.6	103
Second year plants	22.8	110.4

Considerable difficulty was experienced due to the inability of comparing the intensity of the tinctures with the standard solution. Several attempts were made but we were not able to get any close results. The standard ouabain solution had a dark yellowish color but the tincture remains a light greenish in color, even after the addition of the neutral lead acetate solution and the alkaline picrate solution. The greenish tint of the tincture is no doubt due to the pigment (chlorophyll) of the digitalis leaves. The volume of neutral lead acetate solution called for in the method was either insufficient or the Oregon digitalis has a greater content of chlorophyll than that which Knudsen and Dresbach experimented with. As it was impossible to compare the intensity of the color of the two solutions, readings were made by attempting to measure the color tints of the two solutions.

CONCLUSIONS

- 1 The physiological activity of the first-year leaves compared favorably with the second-year leaves
- 2 The activity of native digitalis plants under favorable climatic conditions would probably be above U S P standard
- 3 One-hour frog method unsatisfactory chiefly because of the time element which has a tendency toward erratic results
- 4 Observed only a slight difference in the susceptibility of frogs to cardiac stimulants through the various seasons

REFERENCES

- (1) Wilbert, M, "The Source and Supply of Medicines," Public Health Reports 29, 2715 (1914)
- (2) Roth, "The Activity of Wild American Digitalis," *Ibid*, 32, 377 (1917)
- (3) Miller, F A, "Influence of Soil Composition on Medicinal Plants" *JOUR A PH A* 3, 318 (1914)
- (4) Sparks M J, "The Potency of Various Samples of Digitalis Grown in British Columbia" *Ibid*, 16, 203 (1927)
- (5) Daulphine, *Am J Pharm*, 96, 716 (1924)
- (6) Cippini C, "Activity of Italian Digitalis," *JOUR A PH A YEAR BOOK*, 208 (1922)
- (7) Pater, B, *Ibid*, 97 (1922)
- (8) Hammer, J W, "Relative Values of Cultivated and Wild Digitalis," *Chem Abstr* 9, 510 (1915)
- (9) Focke, C, "Digitalis Leaves" *Am J Pharm*, 91, 177 (1919)
- (10) Miller and Baker, "The Potency of First-Year Cultivation of Digitalis Leaves as Indicated by Physiological Assay," *JOUR A PH A*, 2 198 (1913)
- (11) Straub, W *Chem Abstr* 13, 1363 (1919)
- (12) Hamilton, H, "Deterioration of Tincture of Digitalis," *JOUR A PH A*, 7 433 (1918)
- (13) Focke, C, "Necessity of Tincture of Digitalis for Protection from Light," *PROCEEDINGS OF THE A PH A*, 53, 599 (1905)
- (14) Hallaway, R, "Practical Observation on Preservation and Standardization of Tincture of Digitalis," *Ibid*, 58 118 (1910)
- (15) Pittenger, P, "Biologic Assay"
- (16) Knudsen and Dresbach, "A Chemical Method of Assaying the Active Principles of Digitalis" *J Pharm and Exp Therap*, 20, 205 (1923)
- (17) Hatcher and Brody, *Am J Pharm*, 82 360 (1910)

STUDIES ON THE BIOASSAY OF DIGITALIS *¹

III A NEW DIURETIC OLIGURIC CAT METHOD

BY JAMES H DEFANDORF

Digitalis in toxic amounts has a peripheral constrictor effect on the blood vessels of the kidney in animals (2, 8, 13, 17) which, together with its weakening effect on the circulation, results in a decreased output of urine (oliguria). Since digitalis has a cumulative action, oliguria should follow the repeated administration of small doses and the effect observed by measuring the urine output at short

* Scientific Section, A PH A, continued from Madison meeting A PH A 1933

¹ Department of Pharmacology and Therapeutics School of Medicine The George Washington University, Washington, D C

intervals The increase in toxic activity of the drug, as shown by a constantly decreasing output of urine, should thus serve as a guide to the rate and amount of administration in intravenous methods of assay, and, by indicating the approach of death, make possible a more accurate determination of the minimum lethal dose than can be obtained by the continuous intravenous injection method of Hatcher and Brody (10, 11) and its modifications (1, 12, 19)

The cat was selected as the experimental animal because it can readily be made to exhibit diuresis Moreover, it is the animal most used in this country for the assay of digitalis by an unofficial method

Three tinctures of digitalis were tested, and their effects on urine output were observed following repeated intravenous administration of sub-lethal doses The change from diuresis to oliguria was studied in its relation to the approach of death The minimum lethal doses were determined and compared with those of the subcutaneous (15), new leg-vein (5) and new intramuscular (5) minimum lethal dose guinea-pig methods, and with systolic standstill doses of the U S P X (18),

modified four-hour U S P X (4), Smith-McClosky intravenous (16) and Dooley-Higley intramuscular (6) frog heart methods

EXPERIMENTAL PROCEDURE

Male and female cats, ranging in weight from 1.5 to 4.3 Kg were used They were placed on a milk diet for about a week previous to the experiment, and in a few cases raw liver was added to the diet, but was later omitted when found to be unnecessary The animals were weighed immediately before the experiment, and the dosages of both the anesthetic and digitalis were calculated on this basis In some of the first experiments water was given by stomach tube immediately

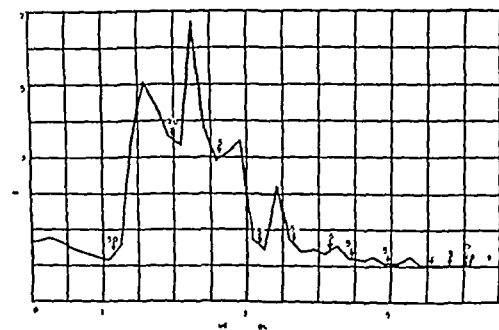


Fig 1—Graphic representation of urine output in the cat following intravenous administration of repeated doses of digitalis (Cat No 13 10/17/33, also see protocol)

before administration of the anesthetic in order to insure an adequate output of urine, but this also was found to be unnecessary and was omitted in the later experiments Sodium barbital, 0.25 to 0.3 of a gram per Kg, was given by stomach tube, and usually excellent anesthesia was obtained by the end of the hour, occasionally a few inhalations of ether were necessary in the induction of anesthesia, and at times during the course of the experiment, which usually lasted several hours

When anesthesia was complete, the femoral vein was exposed for use in intravenous injection A small median incision was made in the lower abdomen, exposing the bladder, and the urine removed by gentle compression or by a hypodermic syringe and needle A small thistle tube cannula was then inserted in the bladder through a small incision, and carefully tied in so as to avoid obstructing the ureters By means of rubber tubing this was connected with a long glass tube, and the system filled with warm saline As fluid began to drop from the distal end of the tube it was collected in tared flasks at stated intervals usually of ten minutes, throughout the course of the experiment, and weighed, the amount of urine excretion being plotted on graph paper

The digitalis solution was prepared for injection by evaporating all alcohol from the tincture and diluting the residue with physiological saline to a 5 per cent solution, so that 1 cc represented 50 mg of the leaf When the urine secretion reached a normal level, which on the average was about thirty minutes after cannulation of the bladder the first injection of digitalis was made with

The minimum lethal doses for tincture "B" are exceptionally uniform, but this is not true for tinctures "C" and "D". The greatest variations from the average minimum lethal doses for "C" and "D" occurred with animals below (3, 15, 24) 2 Kg or above 3 Kg (4, 30)

TABLE I—COMPARISON OF MINIMUM LETHAL DOSES OF TINCTURE 'B,' "C" AND "D" BY THE DIURETIC OLIGURIC CAT METHOD

Tincture	Cat Number	Sex	Weight in Kg	Minimum Lethal Dose Mg per Kg	Average Minimum Lethal Dose Mg per Kg	Average Deviation
B	17	Γ	2 29	80	73 6	± 3 1
B	18	M	2 62	75		
B	19	Γ	1 54	75		
B	20	Γ	2 35	70		
B	21	F	2 55	70		
B	22	M	2 20	75		
B	26	Γ	2 04	70	94 6	±15 3
C	3	Γ	1 87	62 5		
C	4	M	3 13	125		
C	6	M	2 42	85		
C	8	Γ	2 27	100		
C	13	Γ	2 86	115		
C	14	M	3 27	100		
C	15	F	1 44	80		
C	16	Γ	1 64	90	87 1	±15 3
D	24	Γ	1 84	105		
D	25	M	2 80	80		
D	27	Γ	2 61	80		
D	28	Γ	2 22	70		
D	29	F	2 76	65		
D	30	M	4 30	120		
D	31	F	2 60	90		

TABLE II—A COMPARISON OF TINCTURES 'B,' 'C' AND 'D' BY CAT, FROG AND GUINEA PIG METHODS

Animal	Method Used	Tincture B Minimum Systolic* or Lethal ¹ Dose in Mg per Gm	Tincture C Minimum Systolic* or Lethal ¹ Dose in Mg per Gm	Tincture D Minimum Systolic* or Lethal ¹ Dose in Mg per Gm
Frog	U S P X one hour lymph sac	0 8		0 7
	Modified U S P X four hour lymph sac	0 8		0 8
	Intramuscular (Dooley-Higley)	0 8		0 8
	Intravenous (Smith McClosky)	0 4		0 4
Guinea Pig	Subcutaneous (Reed and Vanderkleed)	0 25	0 3	0 3
	New Intramuscular			0 225
Cat	New leg vein	0 175	0 2	0 2
	New diuretic oliguric	0 074	0 095	0 087

* Frog methods

¹ Guinea pig and cat methods

Table II summarizes the results of assays of tinctures 'A' "B" and "C" on frogs, guinea pigs and cats. Tincture 'C' was exhausted before frog assays could be made. Analysis of this table permits the following deductions:

Tinctures "B" and "D" are practically identical in activity as tested by four frog heart methods.

Tincture 'B' is slightly stronger than 'C' and 'D' by the guinea-pig methods, 'C' and 'D' being of equal strength by these tests

Tincture "B" is strongest by the diuretic oliguric cat method, whereas "C" is weaker than "D"

The results of the frog and guinea pig methods are in closer agreement with each other than they are with those of the cat method

When measured by the results of the intravenous frog, new intravenous guinea-pig and new diuretic oliguric cat methods, digitalis is about twice as toxic to the cat as to the guinea pig and about twice as toxic to the guinea pig as to the frog

Cat = 1 Guinea pig = 2 Frog = 4

DISCUSSION

The assays reported above corroborate many observations made in the literature concerning the variations in susceptibility of cats to digitalis (7, 9, 14). The assays on tincture "B" are remarkably uniform, in contrast to the large positive and negative variations in the results obtained with tinctures "C" and "D". Large variations in susceptibility in frogs and guinea pigs are of less importance because large numbers of these animals can be used in contrast to cats, where the experimental procedure is much more prolonged, and the animals more difficult to obtain in large numbers. When small numbers of animals are used for an assay it seems logical to agree with Burn (3) that it is indefensible to set aside the results obtained from one or two cats which show a great difference from the others, such as Cats No 3 and No 4 in tincture "C" (Table I). Burn points out that owing to the large range in sensitivity of cats, "the average of three cats, for example, can never be assumed to be nearer the true value than that of four," and states that the average of results on a small number of cats is more nearly the true value as the number of cats is increased, the true results being obtained from the average of a very large number, such as one hundred.

In the new diuretic oliguric cat method just described the drug is not injected continuously, and this would appear to be an advantage not possessed by the intravenous methods usually employed. As digitalis is a drug which acts slowly, it would appear impossible to get an accurate determination of its true activity when employing a comparatively rapid continuous injection method.

Following the early diuretic effect, the repeated administration of small doses produces a constantly decreasing output of urine (oliguria), a condition due to toxic action, and an excellent indicator of the approach of death, more easily discernible than the heart changes ordinarily observed by auscultation in the usual cat method. Anuria occurs sometimes, before death.

It should also be observed that the best results were obtained with cats ranging in weight from 2 to 3 Kg, in the relatively small number of animals used. Cats above or below these weight limits showed a wider variation in susceptibility. These weight extremes may be identical with extremes in age which might account for the variations in resistance.

SUMMARY AND CONCLUSIONS

A new intravenous cat method for the bioassay of digitalis is described, which utilizes the changes produced in urinary output to determine the amount and frequency of administration of the drug.

The progress from diuresis to oliguria following intravenous injection of successive doses of digitalis is a useful index of the development of toxic activity of the drug, and thus serves as a guide to the frequency and amount of its administration

Cats showed wide individual variations in their susceptibility to digitalis, and their value in the assay of this drug appears questionable since in practice only a few animals are used

Results of frog and guinea-pig assays agreed more closely with each other than with those of the cat method

REFERENCES

- (1) British Pharmacopœia (1932)
- (2) Brunton, L T and Power, H, *Proc Roy Soc London*, 22, 420 (1873-1874)
- (3) Burn, J H *Methods of Biological Assay* London (1928)
- (4) Defendorf J H, *Jour A Ph A*, 22 599 (1933)
- (5) Defendorf J H *Ibid* 1935 March Issue
- (6) Dooley, M S and Higley C D *Proc Soc Exptl Biol and Med*, 19, 250-252 (1922)
- (7) Eckler C R, *Jour A Ph A* 1 715-724 (1912)
- (8) Gottlieb R and Magnus, R *Arch exptl Path Pharmacol*, 47 135 (1901)
- (9) Haskell, C C and Courtney R H *Am J Med Sci*, 167, 816-821 (1924)
- (10) Hatcher R A *Am J Physiol* 23 203-323 (1908)
- (11) Hatcher R A, and Brody J G *Am J Pharm*, 82 360-372 (1910)
- (12) Heart Comm N Y Tuberc and Health Assoc, *J A M A* 102, 862 (1934)
- (13) Marshall C R, *J Physiol* 22 1 (1897-1898)
- (14) Munch J C, Bioassays A Handbook of Quantitative Pharmacology," Baltimore (1931)
- (15) Reed E D, and Vanderkleed, C E, *Am J Pharm*, 80, 110-120 (1908)
- (16) Smith M I, and McClosky, W T, *Pub Health Rep Supp* No 52 (1925)
- (17) Sollmann T A, 'A Manual of Pharmacology,' 4th ed, Philadelphia, 520 (1932)
- (18) U S Pharmacopœia X (1926)
- (19) van Wijngaarden C deL *Arch exptl Path Pharmacol*, 112, 252 (1926)

THE RECTAL ABSORPTION OF DIGITALIS IN CATS *

BY W ARTHUR PURDUM

INTRODUCTION

Digitalis and its preparations, when administered by mouth, frequently cause nausea and vomiting To overcome this untoward effect, Eichhorst, first (3), and later, other investigators have suggested administration by rectum Therefore, digitalis preparations intended for rectal administration in suppository form and in solution have been offered to the medical profession within the last few years

The available clinical reports on the administration of digitalis by rectum are favorable It, therefore, seemed desirable to determine the preparation best suited for rectal use With this objective in view, two preliminary experiments were conducted to determine whether or not digitalis is absorbed from the cat rectum Large

* From the laboratories of A G DuMez, Professor of Pharmacy, and Marvin R Thompson, Professor of Pharmacology School of Pharmacy of the University of Maryland Compiled from a thesis submitted to the Faculty of the Graduate School of the University of Maryland in partial fulfilment of the requirements for the degree of Master of Science

doses of a dealcoholized fluidextract were administered and positive absorption was noted. A comparative study was then made of the rectal absorption of digitalis from different vehicles.

EXPERIMENTAL

A fluidextract of digitalis accurately standardized as to potency was dealcoholized by evaporation at a low temperature. Two anesthetized cats were then given approximately 20 M L D and 10 M L D of this solution by rectum. Difficulty was encountered in keeping the digitalis solution in the rectum due to the severity of the irritation produced. However, the cats received sufficient digitalis to cause death in from 3 to 3½ hours. These results show that digitalis is absorbed when given rectally.

For the purpose of obtaining comparative data on the rate of absorption of different preparations of digitalis when given by rectum, 5 additional series of experiments were conducted. In the first series, 5 separate experiments were carried out and in each of the remaining series, from 9 to 15 experiments. In all cases, the cats were anesthetized and kept under light anesthesia throughout the experiments by means of intraperitoneal injections of one of the barbiturates and, in some cases, ether was used as a supplement. Expulsion of the digitalis preparations was prevented by the application of anal clamps. About 5 hours after the administration of the rectal preparation, an amount of standardized digitalis solution sufficient to cause death was introduced intravenously.

SERIES NO 1

Suppositories were prepared, each containing the following

Powdered Digitalis	0.3 Gm (3 cat units)
Cacao Butter	1 Gm

The results of the experiments with these suppositories are shown in Table I.

TABLE I—ABSORPTION OF DIGITALIS POWDER IN CACAO BUTTER SUPPOSITORIES ADMINISTERED BY RECTUM

Cat No	Weight of Cat in Kg	No of Cat Units Given	No of M L D Given	Time Allowed for Absorption in Hrs and Min	Cc Administered Intravenously (10 Cc Represents 1 Cat Unit)	No of Cat Units Absorbed	No of M L D Absorbed
1	1.93	3	1.55	6 7	20.0		
2	1.91	3	1.57	4 44	24.1		
3	1.77	3	1.69	5 3	22.5		
4	1.72	3	1.74	5 43	10.0	0.72	0.42
5	1.15	3	2.60	6 38	8.8	0.27	0.23

Since cats Nos. 1, 2 and 3 showed no absorption and cats Nos. 4 and 5 showed very slight absorption, the amount of digitalis given was increased in the next series of experiments.

SERIES NO 2

Each suppository used in this series contained

Extract of Digitalis	0.375 Gm (15 Cat units)
Cacao Butter, sufficient to make	2 Gm

An extract of digitalis, 4 times the strength of the powdered digitalis used in the previous series, was used because the incorporation of an equivalent amount of powdered digitalis would have been impractical due to its bulk.

TABLE II—ABSORPTION OF EXTRACT OF DIGITALIS IN CACAO BUTTER SUPPOSITORIES ADMINISTERED BY RECTUM

Cat No	Weight of Cat in Kg	No of Cat Units Given	No of M L D Given	Time Allowed for Absorption in		Cc Administered Intravenously (10 Cc. Represents 1 Cat Unit)	No of Cat Units Absorbed	No of M L D Absorbed
				Hrs	Min			
6	3 15	15	4 76	6	20	33 7		
7	2 80	15	5 35	See below			2 80	1 00
8	2 80	15	5 35	5	50	26 5	0 15	0 05
9	2 75	15	5 45	5	53	32 5		
10	2 73	15	5 49	5	6	17 2	1 01	0 37
11	2 56	15	5 85	6	10	31 6		
12	2 54	15	5 90	4	12	25 2	0 02	0 01
13	2 47	15	6 07	5	19	11 0	1 37	0 55
14	2 45	15	6 12	5	47	20 6	0 39	0 16
15	2 43	15	6 17	5	24	11 6	1 27	0 52
16	2 35	15	6 38	5	10	20 3	0 32	0 14
17	2 27	15	6 60	3	38	17 2	0 55	0 24
18	2 25	15	6 66	5	56	16 7	0 58	0 26
19	1 89	15	7 93	5	27	17 0	0 19	0 10

Cat No 7 died about 3 hours after insertion of the suppository. An autopsy revealed that the heart was in systole which is an indication of digitalis poisoning. However, the cat may have been abnormal and may have died from other causes. Cats Nos 6, 9 and 11 showed no rectal absorption and actually required more solution intravenously than should have been needed theoretically had no digitalis been given rectally.

TABLE III—ABSORPTION OF EXTRACT OF DIGITALIS IN GLACERINATED GELATIN SUPPOSITORIES ADMINISTERED BY RECTUM

Cat No	Weight of Cat in Kg	No of Cat Units Given	No of M L D Given	Time Allowed for Absorption in		Cc Administered Intravenously (10 Cc. Represents 1 Cat Unit)	No of Cat Units Absorbed	No of M L D Absorbed
				Hrs	Min			
20	3 93	15	3 82	5	26	33 3	0 60	0 15
21	3 12	15	4 81	5	20	27 3	0 39	0 13
22	2 85	15	5 26	4	55	21 0	0 75	0 26
23	2 73	13 65	5 00	5	33	30 0		
24	2 72	16 5	6 07	5	40	17 0	1 02	0 38
25	2 70	15	5 56	5	16	10 5	1 65	0 61
26	2 67	15	5 62	4	18	22 0	0 47	0 18
27	2 65	13 25	5 00	4	54	23 5	0 30	0 11
28	2 60	15	5 77	5	45	35 0		
29	2 57	15	5 84	5	5	10 2	1 55	0 60
30	2 42	16 5	6 82	5	31	18 7	0 55	0 23
31	2 33	12 5	5 36	6	3	9 0	1 43	0 61
32	2 30	15	6 52	5	32	17 7	0 53	0 23
33	2 23	11 2	5 02	5	4	16 0	0 63	0 28
34	1 55	15	9 68	5	59	14 3	0 12	0 08

SERIES NO 3

The base for the suppositories which were given throughout this series of experiments was Glycerinated Gelatin, U S P X. Extract of Digitalis of the same lot as that employed in Series No 2 was again used. The suppositories were prepared on two different occasions by the formulas which follow.

Lot No 1	Extract of Digitalis	0 225 Gm (9 cat units)
	Glycerinated Gelatin, sufficient to make	2 4 Gm
Lot No 2	Extract of Digitalis	0 375 Gm (15 cat units)
	Glycerinated Gelatin, sufficient to make	2 4 Gm

In both cases, the extract was thoroughly incorporated with the fused glycerinated gelatin after the source of heat had been removed from the base. This procedure prevented prolonged heating of the extract which would inactivate the digitalis principles.

In those cases in which the suppositories containing 9 cat units of digitalis were used, it was necessary to administer a fraction more than one suppository to approximate the dosage desired.

SERIES NO 4

The results obtained in the preceding experiments indicate relatively poor absorption when cacao butter or glycerinated gelatin are used as suppository bases. It was, therefore, inferred that, perhaps, the absorption was retarded by these bases. To determine the correctness of this observation, a series of experiments was run in which gelatin alone was used as the base and in which the proportion of the latter was reduced to a minimum. This was accomplished by administering No 1 hard gelatin capsules into which 0 375 Gm (15 cat units) of extract of digitalis was packed. Prior to insertion of the capsules water, in an amount equal to about 10 cc, was injected into the rectum to aid the dissolution of the capsule material.

TABLE IV—ABSORPTION OF EXTRACT OF DIGITALIS IN HARD GELATIN CAPSULES ADMINISTERED BY RECTUM

Cat No	Weight of Cat in Kg	No of Cat Units Given	No of M L D Given	Time Allowed for Absorption in Hrs and Min	Cc Administered Intravenously (10 Cc Represents 1 Cat Unit)	No of Cat Units Absorbed	No of M L D Absorbed
35	3 80	15	3 95	5 4	34 9	0 31	0 08
36	3 15	15	4 76	5 13	30 7	0 08	0 03
37	3 10	15	4 84	5 17	15 0	1 51	0 52
38	3 05	15	4 92	5 21	29 6	0 09	0 03
39	3 00	15	5 00	5 33	14 9	1 51	0 50
40	2 87	15	5 23	5 47	23 0	0 57	0 20
41	2 85	15	5 26	5 38	25 8	0 27	0 09
42	2 85	15	5 26	5 20	25 0	0 35	0 12
43	2 40	15	6 25	5 0	21 6	0 24	0 10
44	2 23	15	6 73	6 21	23 3		
45	2 13	15	7 04	5 39	16 3	0 50	0 23
46	1 80	15	8 33	5 19	10 5	0 75	0 42
47	1 80	15	8 33	5 7	14 5	0 35	0 19
48	1 70	15	8 82	5 46	14 0	0 30	0 18

The heart beat of cat No 37 was weak and irregular throughout the experiment. After death, the heart was examined and found to be in diastole which throws doubt upon the probability of death from digitalis.

SERIES NO 5

In the experiments which follow, the possible influence of any extraneous matter was eliminated completely by injecting a dealcoholized tincture of digitalis. The tincture was prepared by the U S P X method and the alcohol was removed by heating to about 50° C in an open vessel, over which a current of warm air was passed until all of the alcohol had evaporated. The solution was injected by means of a rectal tube attached to a hypodermic syringe.

TABLE V — ABSORPTION OF DIALCOHOLIZED TINCTURE OF DIGITALIS ADMINISTERED BY RECTUM

Cat No	Weight of Cat in Kg	No of Cat Units Given	No of M L D Given	Time Allowed for Absorption in Hrs and Min		Cc Administered Intravenously (10 Cc Represents 1 Cat Unit)	No of Cat Units Absorbed	No of M L D Absorbed
49	3 80	19	5	5	40	14 5	2 35	0 62
50	3 35	16 75	5	5	28	35 5		
51	3 30	16 5	5	5	33	31 0	0 20	0 06
52	3 02	15 1	5	4	53	19 6	1 06	0 35
53	2 85	14 25	5	4	17	19 5	0 90	0 32
54	2 38	11 9	5	5	40	6 5	1 73	0 73
55	2 35	11 75	5	See below			2 35	1 00
56	2 02	4 04	2	4	21	17 0	0 32	0 16
57	1 87	9 35	5	5	46	16 3	0 24	0 13

Cat No 55 died about three hours after receiving the rectal digitalis solution. It is believed that digitalis was the cause of death because the usual symptoms of digitalis poisoning were noted.

CONTROL EXPERIMENTS

During the course of the experiments, the problem arose as to whether or not the prolonged anesthesia and the clamping of the anus materially affected the results obtained. To solve this problem, control experiments were run as follows:

Two cats were anesthetized in the manner employed throughout this work. As soon as anesthesia was induced the ani were clamped to simulate the conditions when digitalis was administered rectally. After about six hours digitalis solution was introduced intravenously in an amount sufficient to kill the cats. This amount was found to be within 10% of the calculated minimum lethal dose in both cases.

DISCUSSION

The available published clinical reports highly recommend rectal digitalis therapy (2, 3, 4, 5, 6, 7, 8 and 9), citing several advantages for it over the oral method, and suggest it as a substitute for intravenous and subcutaneous administration. The results of the investigations upon which the findings reported in this paper are based do not confirm those reported by clinicians. While it is true that in the experiments from which these results were obtained the test animals used were cats and the drug was administered under abnormal conditions, *i. e.*, prolonged anesthesia and clamping of the anus, it has been shown by control experiments that these abnormalities caused no perceptible effect on the susceptibility of the cats to the drug. It is possible, however, that the application of anal clamps may have either hastened or retarded absorption.

The absorption of digitalis from the rectum was found to be very slow and small in amount considering the large doses which were administered. Nausea and emesis occurred in the interval elapsing between the rectal administration and the intravenous administration of the drug in approximately half of the experiments. This may have been caused by the anesthetic since emesis was observed in one of the controls. The digitalis was observed to be quite irritating to the rectum since it was necessary to clamp the anus to prevent expulsion of the drug and since autopsies disclosed considerable inflammation, even in the recta of those cats on which anal clamps were not used. The rate of absorption from the rectum was also found to be irregular and inconsistent as evidenced by the large variations in the amounts which were absorbed by different cats.

Scrutiny of the preceding tables shows that digitalis is more rapidly absorbed from the rectum when administered in the form of the dealcoholized tincture than in the other forms which were employed. Following, in the order of rapidity of absorption, are glycerinated gelatin suppositories, cacao butter suppositories and finally, hard gelatin capsules.

Since available clinical results indicate rapid rectal absorption, it is evident that either the procedure of study which has been followed does not reflect accurately the absorption in the human, or, it is possible that the means by which other workers made their observations are not sufficiently dependable. Whether or not the procedure used in this work reflects the absorption rate in humans, it is believed that a comparative study of rectal, oral and subcutaneous absorption using this technique, will provide reliable information on the relative absorption rate through the above three avenues of administration in humans. However, future work is contemplated to compare relatively these three means of administration.

In view of the foregoing work, it appears that the rectal mode of giving digitalis may be a good one when digitalization is to be maintained over a rather lengthy period and when a prompt action is not essential.

CONCLUSIONS

- 1 Digitalis is absorbed from the rectum
- 2 The rectal absorption in cats is very slow, irregular and erratic
- 3 Considerable irritation and inflammation was found to be produced in the rectum as a result of rectal administration of digitalis
- 4 The most rapid absorption by rectum was observed when a dealcoholized tincture of digitalis was given
- 5 The actual significance of these results will not become evident until the absorption rate following oral administration has been determined in the same manner
- 6 The rectal method for administering digitalis should be subjected to more investigation before it be accepted as conventional

REFERENCES

- (1) Thompson, C J S, 'The Mystery and Art of the Apothecary' 1st Edition, 241-244 (1929)
- (2) Robinson G C "The Therapeutic Use of Digitalis" 1st Edition 121 (1923)
- (3) Nonnenbruch, W, and Gotsch, K, 'Über rektale Digitalistherapie' *Med Klin*, 28 1127-1128 (1932)
- (4) Zondek, S G, "Über Erfahrungen mit der rectalen Digitalistherapie," *Klin Wochschr*, 4, 1353-1354 (1925)
- (5) Zwilichowskaja, E E, "Über die rectale Anwendung von Herzmitteln" *Z klin Med*, 117, 129-136 (1931)
- (6) Zemets, A, and Mikheleva, V, 'Administration of Cardiac Remedies by Rectum,' *Vrachebnaya Gazeta* 19 1417 (1930), through *J A M A*, 96, 230 (1931)
- (7) Brucke, K, 'Über rektale Digitalisbehandlung,' *Deut med Wochschr*, 53, 1590-1591 (1927)
- (8) Semler R, "Zur Therapie der Hämorrhoiden" *Deut med Wochschr* 51, 1953 (1925)
- (9) Rapp, R 'Wissenschaftliche Pharmazie in Rezeptur und Defektur,' 2nd Edition 124-132 (1929)
- (10) Eschenbrenner, H, "Versuche zur Herstellung eines zur rektalen Digitalistherapie verwendbaren Digitalisextraktes," *Standeszeitung Deutscher Apotheker*, 49, 189-192 (1934)

NON-HEPTANE CONSTITUENTS OF DIGGER PINE (PINUS SABINANA)

BY ARTHUR H UHL *

In 1928, Foote (1), in cooperation with the Ethyl Gasolene Corporation of Yonkers, N Y, rectified the principal constituent of Jeffrey Pine oil, heptane. The non-heptane constituents of the oil were further investigated. This investigation revealed the presence of *n*-octylic, *n*-nonylic and *n*-decylic aldehydes.

Approximately 20 gallons of that portion of the oil of digger pine which boils above 110° was received from the California Chemical Corporation. The heptane which constitutes approximately 90-93 per cent (2) of the oil had been previously removed. The 20 gallons, therefore, represented between 1800 and 1900 gallons of the original oil.

Isolation of the Aldehydes—The aldehydes were removed from the oil by shaking with a 30% solution of sodium acid sulphite. The solid addition product was separated on a force filter and washed with ether. The aldehydes were regenerated by treatment with sodium carbonate and separated by steam distillation. There resulted 625 Gm of aldehydes. The aqueous sulphite mother liquor was treated likewise and an additional 51 Gm were obtained.

Identification of the Aldehydes—Because excess heating was likely to destroy or change some of the higher aldehydes, the first fractionation was run as rapidly as possible. The 625 Gm of aldehydes were fractionated, under a pressure of 3 mm, into ten convenient fractions using a short Vigreux column.

	B P	Sp Gr
1	- 45°	0.8182
2	45- 50°	0.8236
3	50- 60°	0.8260
4	60- 70°	0.8281
5	70- 80°	0.8400
6	80- 90°	0.8560
7	90-100°	0.8563
8	100-110°	0.8501
9	110-120°	0.8520
10	120-130°	0.8495
11	Residue	

Inasmuch as decomposition took place in Fractions 9 and 10, distillation was discontinued.

Although the fractions obtained gave some indication as to the possible aldehydes present, the melting points of derivatives were inconsistent and not sharp. The individual fractions were refractionated under a pressure of 10 mm using a 12-inch Widmer column.

The various fractions yielded

Fraction No 1	Fraction No 4
a -56°	a 74-76°
b 56-58°	b 76-78°
c 58-60°	c 78-80°
d Residue	d Residue

* Laboratory of Plant and Pharmaceutical Chemistry, University of Wisconsin, Madison, Wisconsin

Fraction No 2

<i>a</i>	60-62°
<i>b</i>	62-64°
<i>c</i>	64-66°
<i>d</i>	Residue

Fraction No 5

<i>a</i>	84-86°
<i>b</i>	86-88°
<i>c</i>	88-90°
<i>d</i>	Residue

Fraction No 3

<i>a</i>	66-68°
<i>b</i>	68-70°
<i>c</i>	70-74°
<i>d</i>	Residue

Fraction No 6

<i>a</i>	90-92°
<i>b</i>	92-94°
<i>c</i>	94-98°
<i>d</i>	Residue

Fraction No 7

Decomposition began and distillation was discontinued

By way of comparison, the constants of the aldehydes and derivatives of previous workers may be tabulated with those found

FRACTION NO 2

	Found	Recorded for <i>n</i> Octyl Aldehyde
B p	60-62°	60-63° at 10 mm (3)
Sp Gr	0.8236 at 20°	0.8211 at 20° (3)
<i>n</i> _D	1.4206 at 20°	1.4955 (4)
α_D	± 0	± 0 (4)
M p of thiosemicarbazone	94-94.5°	94-95° (5)

This fraction corresponds to *n* octyl aldehyde

FRACTION NO 3

	Found	Recorded for <i>n</i> Nonyl Aldehyde
B p	70-74° at 10 mm	72° at 10 mm (6)
Sp Gr	0.8297 at 20°	0.8277 at 15° (7)
<i>n</i> _D	1.4273 at 20°	1.42452 at 16° (7)
α_D	$\pm 0^\circ$	$\pm 0^\circ$ (7)
M p of thiosemicarbazone	77°	77° (5)

This fraction corresponds to *n* nonyl aldehyde

FRACTION NO 6

	Found	Recorded for <i>n</i> Decyl Aldehyde
B p	90-92° at 10 mm	92° at 10 mm (8)
Sp Gr	0.8502 at 20°	0.8538 at 15° (9)
<i>n</i> _D	1.4287 at 20°	1.4273 (9)
α_D	$\pm 0^\circ$	$\pm 0^\circ$ (9)
M p of thiosemicarbazone	99-100°	99-100° (5)

This fraction corresponds to *n*-decyl aldehyde

On standing in a refrigerator, Fractions 7, 8 and 9 became partly solid. The solid white material was collected on a force filter, recrystallized from alcohol and dried. It had a melting point of 42° to 43°. After further purification by recrystallization from alcohol the melting point remained unchanged.

	Found	Recorded
Laurel Aldehyde		
M p	42-43°	44.5° (10)
M p thiosemicarbazone	100-100.5°	101.5-102.5° (11)

This fraction corresponds closely to laurel aldehyde which is indicated

The mother liquor was placed in a refrigerator and again solid material separated which partly liquefied when an attempt was made to collect it at room temperature. The solidifying point was determined and found to be 22.5°

Myristic Aldehyde	Found	Recorded
M p	22.5°	23° (12)
M p oxime	82.5-83.5°	82.5° (12)
M p semicarbazone	101.5°	100-101° (13) 106° (12)

This fraction corresponds to myristic aldehyde

There are indications of other aldehydes present, especially those with a larger number of carbon atoms, but it was impossible to obtain derivatives pure enough to characterize the compounds

CONCLUSION

N-octylic, *n* nonylic, *n*-decylic and *n*-myristic aldehydes have been isolated and identified and *n*-lauric aldehyde is indicated

REFERENCES

- (1) JOUR A PH A, 18, 350 (1929)
- (2) *Bericht S & Co* Oct 1906, p 64
- (3) Gildemeister und Hoffmann, *Die ätherischen Öle*, 3 Aufl Bd 1 (1928), p 507
- (4) Semmler, *Ber* 42 p 1161 (1909)
- (5) *Bericht S & Co*, Apr 1915, p 48
- (6) Wagner, "Die Aldehyde," p 145 (1931)
- (7) Walbaum and Stephan *Ber*, 33, p 2303 (1900), *Bericht S & Co* Oct 1900, p 56
- (8) *Bericht S & Co*, Oct 1907, p 154
- (9) *Ibid*, 1927, p 178
- (10) *Chem and Drugg Diary*, p 261 (1925)
- (11) *Bericht S & Co* 1904 p 49
- (12) Stephen *J Chem Soc*, 127, p 1874 (1925)
- (13) *Bericht S & Co* Apr 1906, p 71

RUSSIAN ERGOT

BY H H RUSBY

No specific account of Russian ergot, cured as our Pharmacopœia directs, and preserved in its natural state, has come to my attention. All published information that I have seen has related to commercial supplies, which have been accurately described by Henning as "usually arriving in a damp and moldy condition."

More than a year ago, I entered into communication with the Russian department of agriculture for the procural of samples officially prepared and sent direct, so as to arrive in an unaltered state. I made it clear that my criticisms of Russian ergot had no relation to Russia or its products as such, but had been made wholly in the interest of improvement of the materia medica. Several years ago, I had urged our food and drug authorities to secure, through our State Department, co-operation with Russia in the investigation of this subject and in the improvement of the latter's product, but without result. The Committee of Revision has taken no steps, as a part of their research work, to ascertain the facts regarding this drug. Thus I, perforce, took it up myself.

In the spring of 1934 I received official assurance that during the coming harvest the desired samples would be prepared and sent to me, and in the Fall the following collections were received

- No 1 Collected at Verhovski, Central Russia District, Select Experiment Station, August 1934
- No 2 Collected at Gorkey Province, formerly Nijny, Novgorod, Plant Protection Institute, August 14, 1934
- No 3 Collected at West Russia Minsk Agricultural Experiment Station, August 19, 1934
- No 4 Collected at West Russia (Belorussia), Minsk Agricultural Station, August 20, 1934
- No 5 Collected at Central Russia, Voronej Agricultural Experiment Station, August 1934
- No 6a Collected at Ukraine Kalirkov Province, from a barn in the survey District August 1934
- No 6b Obtained from a grain elevator in the same place
- No 0 Collected in Central Russia, Black Earth Province, Semilovski District, Moronej Station for Plants August 1934

Later, a second shipment was received, containing the following samples

From East Siberia Select Center, Voronej District, September 8, 1934

From southeast Russia, Saratov Region

Two others, locality not specified

The differences observed among these samples were of minor importance and insignificant, the important questions relating to their agreement with or disagreement from Spanish ergot, and the Russian ergot that has been known in the American market. The most important of these questions related to the color of the fractured surface. That of Spanish ergot is characteristically white. That required by our Pharmacopœia is "white, tinged with pink or gray" (see ergot monograph, published by the Revision Committee, September 1, 1934). The most careful examination of the official and authentic samples here considered fails to show any grains having a "pink" or any other than a white fracture! Since these samples represent all the important collecting districts of Russia, the conclusion is inevitable that normal Russian ergot exhibits only a white fracture.

This naturally raises a question as to why the Committee of Revision should have specified the pink fracture, irrespective of its source. This must be because the Committee has depended for its description on the color ordinarily presented by the Russian ergot that has been admitted to use in this country, and which has been pink or purplish. As a matter of fact, it is known to every one that practically all the Russian ergot that has been in use in the United States until recently has shown this purplish fracture and has therefore been at disagreement with the normal product, as now shown by the samples under consideration. This in turn must be due to the fact that these supplies have undergone a color change as a result of the "damp and moldy" conditions to which they have been subjected.

In order to verify this conclusion, I made a mixture of portions of all the samples, soaked them thoroughly in water and permitted them to lie in a warm place until badly decomposed, whereupon they were found to have the "pink" or purplish color on fracture.

We have, however, a somewhat more practical evidence of this fact. It is a fact that our food and drug officials, as a result of the famous ergot controversy of the past few years, have discontinued the admission of the damaged ergot with pink fracture referred to, so that, at the present time, we find the Russian ergot of our market of good quality and presenting the same white fracture and characteristic odor as that of the official samples here considered.

A very remarkable situation is thus presented. The Committee of Revision, basing its action on a knowledge of the adulterated article formerly common in our market, specifies the pink fracture of that product, but the food and drug officials correct their former practice, excluding the adulterated article, and by doing so, directly violate the present Pharmacopœia requirement! What can be done to harmonize the existing contradiction? Two alternatives are presented. The Pharmacopœia Committee may correct its description, or the food and drug officials may resume their former custom, in order to conform with the Pharmacopœia. The only other possible course would be to subject all sound Russian ergot to a process of soaking and fermentation, in order to develop the required pink color.

An interesting question is how the Russian ergot of commerce came to be changed from its natural state so as to acquire the purplish color. At present, this can only be conjectured, but it is my personal opinion that somewhere on its way from production to importation, it has been moistened in order to increase its weight, the resulting decomposition having then occurred.

Aside from the matter of fracture-color and odor, this official ergot shows little difference from the well-known sound product of Spain and Portugal. Indeed, there is no good reason why this difference in fracture-color should exist between individuals of the same plant species as grown in two countries. The grains have the same clear, bright outer surface and characteristic odor as the Spanish article. Externally, the color is not such a dark chocolate as that of the Spanish. It might, perhaps, be better described as of a dull black, ranging toward gray-black, and with a slightly reddish tinge when viewed in a strong light. Number 6 is almost black, Nos. 1 and 4 almost equally so, Nos. 2 and 3 almost as dark, and both show a little more of the reddish tinge mentioned. Numbers 5 and 0 show the grayish tinge mentioned.

In form, the grains do not differ greatly from the Spanish, although in general a little more slender and smaller. The following table shows the sizes.

No	Average Length	Thickness
1	1.6 cm	3 to 5 mm
2	1.3 cm	2 to 4 mm
3	1.6 cm	2.5 to 6 mm
4	1.6 cm	3 to 5 mm
5	1.3 cm	2 to 3 mm
6	1.4 cm	2.5 to 4 mm
0	1.1 cm	1.5 to 3 mm

NOTE. Harry Taub, Assistant Professor in my Department, in collaboration with Abraham Taub, Assistant Professor in the Department of Chemistry, performed a series of chemical assays on the fluidextracts of Russian ergot and Spanish ergot referred to in this article and found that there is practically no difference between the two ergots when the fluidextracts are made from a good quality crude drug. Their assays showed an average of 0.64 mg. of ergotoxine ethanesulphonate per 100 cc. of fluidextract of Russian ergot and 0.65 mg. per 100 cc. of fluidextract of Spanish ergot.—H. H. R.

A very striking difference is found between the Spanish and normal Russian ergots after being powdered, the Russian powder being blackish, the Spanish light brown and with a strong pinkish tinge

The following conclusions are clearly established by the evidence here given

- 1 The normal fracture color of all ergot is white
- 2 The purple fracture color that has been commonly seen in Russian ergot is the result of decomposition caused by exposure to dampness and resulting putridity
- 3 The specification by the U S P Revision Committee of pink color in the fracture of ergot is the result of the former prevalence in our drug market of such decomposed ergot
- 4 At the present time, the Russian ergot in the American market is in general of sound quality and exhibits a white fracture color
- 5 All reference to pink fracture should be eliminated from the U S P description of ergot
- 6 Whatever method of bio assay may be adopted should be based on tests made with ergot of white fracture Tests that have been made with the deteriorated ergot of pink fracture should be scrapped

All the specimens of Russian ergot herein referred to are preserved in the museum of the New York College of Pharmacy, where they may be seen

That portion of the same samples that has been caused to develop the purple fracture color by decomposition is also preserved at the same place

A sample of Russian ergot, such as is now being sold in the New York market, of sound quality and exhibiting a white fracture, will also be found there

Portions of all the above samples have been submitted and deposited with this paper

To anyone who still retains enough interest in the cockscomb test to apply the same, samples of the fluidextract made from these sound Russian ergots and from similar sound Spanish ergot, will be supplied upon request



Pharmacie de **J.B. CAVENTOU**

*Ap. pour le Tour de la Côte à Ph. rue de la République 100
18 Boulevard de la République de la Côte à Ph. rue de la République 100
P. n. 100 n. 100 n. 100 n. 100*



Note de Medicaments fournis à M^{re} Duplessis

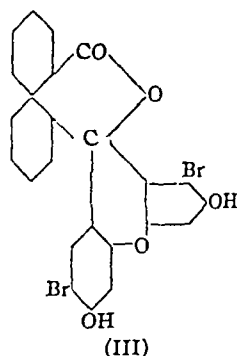
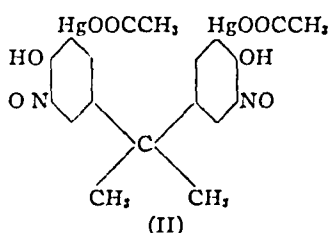
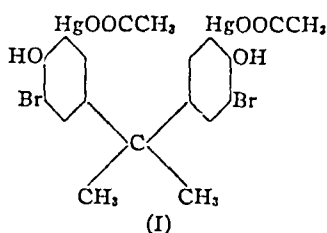
1862 Nov	17	1 B ^{te} Eau de Sedlitz	1	20
	20	Semence aux cornues	"	60
	22	Syrup de Gomme & R	1	20
		Mixt de Marshmallow	"	70
	24	Sedlitz de Potassium Iodide	1	20
juillet	17	une B ^{te} Eau de Sedlitz p. l'eau	1	20
Oct	26	Eau de Sedlitz	"	20
	29	une B ^{te} Eau de Sedlitz	1	20
	"	Gomme Arabique	1	20
juin	16	Bidon de Bismuth	2	20

A bill rendered by the Pharmacy of J B Caventou for "La Dame aux Camelias" Without giving the titles, we are assuming the items to be A bottle of "Sedlitz water," Cucumber Pomade, Syrup of Acacia Narbonne Mixture, Potassium Sulphate solution, a bottle of Sulphur Water (Boréges) Sulphur Cerate, a bottle of Sedlitz Water, Acacia, Spermaceti

STUDY OF GERMICIDAL AND ANTISEPTIC ACTIVITY OF SOME MERCURY COMPOUNDS *¹

BY E. MONESS, S. E. HARRIS AND W. G. CHRISTIANSEN

Three compounds were selected for this study, 3,3'-dibromo-4,4'-dihydroxy-5,5'-diacetoxymercuri diphenyl dimethyl methane (I), 3,3'-dinitro-4,4'-dihydroxy-5,5'-diacetoxymercuri-diphenyl-dimethyl-methane (II), and a mono acetoxy-mercuri-derivative of 5',5''-dibromo-resorcinol diphenem (III). The position



of the mercury in the product (which will be designated as (IV)) obtained from (III) was not determined. Mercurated dibromo fluorescein is believed to be mercurated in one of the resorcinol nuclei. However, recent studies in this laboratory on mercurated dibromo diphenyl-phenol-phthaleins (1) and mercurated derivatives of substituted diphenol-isatin (2) strongly suggest that this type of compound may mercurate in the phthalic acid, diphenic acid or corresponding portions of the molecule.

The three compounds all showed useful germicidal activity.

TABLE I —TESTED IN DISTILLED WATER

Compound	Dilution Killing Typhoid		Dilution Killing Staphylococcus Aureus	
	5 Min	10 Min	5 Min	10 Min
(I)	1-1500	1-1500	1-1500	1-2500
(II)	1-1000	1-1500*	1-5000	1-5000
(IV) a 1st batch	1-250	1-2000	1-500	1-1000
b 2nd batch	1-1000	1-4000	1-500	1-1000

* Inhibits growth only—does not kill

TABLE II —TESTED IN BLOOD SERUM

Compound	Dilution Killing Typhoid		Dilution Killing Staphylococcus Aureus	
	5 Min	10 Min	5 Min	10 Min
(I)	1-500	1-500	1-1000	1-1500
(II)	Not Tested			

* Section on Practical Pharmacy and Dispensing, Madison meeting, 1933

¹ Research Department of the Chemical and Pharmaceutical Laboratories, E. R. Squibb and Sons, Brooklyn, N. Y.

(IV)	a	1st batch	1-100	1-1000	1-250	1-500
	b	2nd batch	1-250	1-1000	1-100	1-500

Compound (IV) was further tested for bacteriostatic activity

Batch	Dilution at Which Compound Is Bacteriostatic Typhoid		Staphylococcus	
	24 Hrs	48 Hrs	24 Hrs	48 Hrs
1	1-20 000	1-10 000	1-30 000	1-20,000
2	1-100,000	1-50,000	1-500,000	1-250,000

The examination also included tests of the action of compounds (I) and (IV) on tissue, with the following results

Compound I—1 Non irritating to shaved unabraded skin and to shaved abraded skin
2 Produces slight to moderate swelling in subcutaneous tissue on repeated injection persisting for 21-24 days
3 Autopsies following injection showed no degenerative changes due to the toxicity of the compound in liver or kidney The autopsies were performed at the end of the test, so that no information was furnished as to possible temporary toxic action

Compound IV—1 Non irritating to shaved and unabraded skin
2 Only slightly irritating to shaved abraded skin
3 Produces very slight swelling on subcutaneous injection and a scab at the site of intradermal injection

Solutions Used in Tests—The compound (IV) was prepared for test by dissolving in water containing 2 molecular equivalents of sodium hydroxide and diluting to a final concentration of 2% This solution was diluted with distilled water immediately prior to the germicidal and bacteriostatic tests The same solution was used in the animal experiments

Solution of Compound (I) was effected in an exactly similar manner, except that the original concentration was 1-500 Compound (II), however, required a large excess (about 15 mols) NaOH to produce a clear 1-250 or 1-500 solution The latter concentration was used for testing

The animal experiments were conducted on albino rats

EXPERIMENTAL

The preparation of these compounds was carried out along familiar lines, mercuration of the suitable intermediates being effected in boiling alcohol solution

Resorcinol Diphenem—The diphenem required for compound (IV) was prepared by the procedure of Dutt (3) The starting material was technical 70% phenanthrene which was oxidized to phenanthraquinone by the method of Oyster and Adkins (4) and subsequently to diphenic acid according to German Patent 516,282, using sodium peroxide as the oxidizing agent Diphenic anhydride was then prepared by the method of Oyster and Adkins (5) and condensed with resorcinol (3) The product, however, did not melt at 172° C as stated by Dutt but softened at 70° C and is completely melted at 100° C The bromine derivative, however, was prepared without difficulty

Dibromo Resorcinol Diphenem—Thirty-five cc of a 20% solution of bromine in glacial acetic acid was added to a well stirred solution of 8.6 Gm of resorcinol diphenem in 170 cc glacial acetic acid The mixture was heated on the steam-bath for fifteen minutes and poured into 2000 cc of cold water The yellow flocculent precipitate was filtered off, washed with water and dried giving a yellow powder

0.2277 Gm of substance required 7.92 cc of *N*/10 AgNO₃ solution

Br found, 27.83%

Calculated for C₂₆H₁₄O₃Br₂, 28.26%

Mercuration of Dibromo Resorcinol-Diphenem—Fifteen Gm of dibromo resorcinol diphenem was dissolved in 250 cc of alcohol and the solution refluxed with good stirring A solution of 8.41 Gm of mercuric acetate in 42 cc of water slightly acidified with acetic acid was then added dropwise during 45 minutes to the well stirred, boiling diphenem solution After boiling and stirring for a further period of 15 minutes a brown precipitate had formed and the clear superna-

tant liquid gave a negative test for inorganic mercury with ammonium sulphide and sodium hydroxide. The precipitate was filtered off, washed with alcohol and dried *in vacuo*. Yield—16 Gm. The substance was a brownish purple powder insoluble in the common organic solvents but readily soluble in alkali hydroxide solutions. Such solutions were dark red by transmitted light, opaque with a greenish fluorescence by reflected light, and did not stain the skin.

0.2523 Gm. of sample gave 0.0728 Gm. of mercury

Hg found, 28.80%

Calculated for $C_{24}H_{16}O_6BrHg$, 24.22%

The high mercury content indicates contamination with the diacetoxy mercury compound or hydrolysis to the hydroxymercuri derivative. This point was not investigated since the use of the compound in aqueous alkaline solutions inevitably transforms any acetoxy derivative to the hydroxy form.

4,4'-Dihydroxy Diphenyl Dimethyl Methane—One hundred and eighty-eight Gm. phenol, 30 Gm. acetone and 15 Gm. phosphorus oxychloride were mixed at 20° C. The temperature was then raised to 40–45° C. and a further 15 Gm. phosphorus oxychloride added. The mixture was allowed to stand for 72 hours during which time it set to a solid mass. This was broken up, treated with water and steam distilled to remove excess phenol. The residue was cooled with vigorous stirring. The granular product was filtered off, washed with water, dried and purified by distillation *in vacuo*.

B. p., 225–230° C / 4 mm. M. p., 144° C.

Yield—119 Gm.

0.2297 Gm. gave CO_2 0.6627 Gm., H_2O 0.1458 Gm.

	Carbon	Hydrogen
Found	78.7%	7.11%
Calculated for $C_{16}H_{16}O$	78.9%	7.06%

3,3'-Dinitro-4,4'-Dihydroxy Diphenyl Dimethyl Methane—Thirty-one Gm. of 4,4'-dihydroxy-diphenyl dimethyl methane was dissolved in 300 cc. glacial acetic acid and to the well stirred solution 14 Gm. concentrated nitric acid was added dropwise. After standing twenty minutes the reaction mixture was poured into 1500 cc. of cold water. The gummy precipitate was washed with cold water and recrystallized from 250-cc. absolute alcohol. It formed a yellow microcrystalline powder.

M. p., 132° C.

0.3115 Gm. gave 23.5 cc. moist N_2 at 24° C. and 767 mm.

N found 8.5%

Calculated for $C_{16}H_{10}N_2O_6$, 8.9%

3,3'-Dinitro-4,4'-Dihydroxy 5,5'-Diacetoxy Mercuri Diphenyl Dimethyl Methane—10.5 Gm. of 3,3'-dinitro-4,4'-dihydroxy diphenyl dimethyl methane was dissolved in 250 cc. of alcohol and the solution stirred under a reflux condenser. A solution of 19 Gm. of mercuric acetate in 100 cc. water and 5 cc. glacial acetic acid was then added and the mixture refluxed and stirred for 18 hours until a side test showed absence of ionic mercury. The precipitate was then filtered off, washed with alcohol and ether and dried. The product formed a bright yellow powder insoluble in alcohol and the common organic solvents but soluble in alkali hydroxide solutions to yield fluorescent brown solutions.

Yield, 17.0 Gm.

0.1995 Gm. gave 0.0948 Gm. Hg.

Hg found, 47.5%

Calculated for $C_{19}H_{18}N_2O_{10}Hg$, 48.1%

3,3'-Dibromo-4,4'-Dihydroxy 5,5'-Diacetoxy Mercuri Diphenyl Dimethyl Methane—28 Gm. 4,4'-dihydroxy diphenyl methane was dissolved in 250 cc. glacial acetic acid and 40 Gm. bromine added dropwise with good stirring. The solution was then allowed to stand fifteen minutes and

poured into 1500 cc of water. The sticky precipitate was washed free of acid with water and mercurated without further purification, because attempts to crystallize this substance led to decomposition with the formation of red coloring matters.

The hot solution of 23 Gm mercuric acetate in 100 cc of water and 5 cc glacial acetic acid was added to a refluxing solution of 11 Gm crude 3,3'-dibromo-4,4'-dihydroxydiphenyl dimethylmethane with continuous stirring. About fifteen minutes were required for the addition of the mercuric acetate solution. A white precipitate commenced to form during the addition of the mercuric acetate and continued for about 45 minutes. At the end of this time inorganic mercury could no longer be detected in the solution. The latter was cooled and the heavy white precipitate collected by filtration, washed with ether and dried.

Yield, 18 Gm

M p—decomposes 250° C

0.1704 Gm gave 0.0775 Gm Hg

Hg found, 44.5%

Calculated for $C_{16}H_{18}O_6Br_2Hg_2$, 44.5%

The product formed a white amorphous powder, insoluble in the common organic solvents but soluble in a considerable excess of alkali hydroxide solution.

The mercury analyses reported here were carried out by the Whitmore gold crucible method.

The biological tests on compounds reported herein were made in the Biological Research Laboratories of E. R. Squibb and Sons and we gratefully acknowledge their assistance.

REFERENCES

- (1) Harris and Christiansen *Jour. A. Ph. A.* 22, 723 (1933)
- (2) Harris and Christiansen *Ibid.* 23, 109 (1934)
- (3) Dutt *J. Chem. Soc.* 123, 225 (1922)
- (4) Oyster and Adkins *J. A. C. S.* 43, 208 (1921)
- (5) Oyster and Adkins *Ibid.* 43, 205 (1921)

VEGETABLE EXTRACTS AND BLOOD-SUGAR *

BY PAUL S. JORGENSEN AND E. V. LYNN

Just after the discovery of insulin Collip (1) prepared² from various vegetables, as well as from animal tissue, extracts which were capable of producing hypoglycemia in animals. The effects differed from those by insulin in requiring a comparatively long period before their appearance. A further very interesting observation he made was that the serum or defibrinated blood of an animal, made hypoglycemic by insulin, by the plant extracts, by chemicals, by starvation or by pancreatectomy, had similar marked lowering effect on the sugar in another animal and could even cause death. The decrease in sugar and toxicity could thus be transmitted from one individual to another, apparently without limit.

Thalkimer and Perry (2), in a very limited study, reported an insulin-like action by injection of raw potato juice. Winter and Smith (3) noted similar results from extracts of yeast. Others (4) have partly confirmed or directly contradicted this testimony.

In 1927 Allen (5) described the action of myrtomel (earlier called myrtillin), an extract made from leaves of the genus *Vaccinium* by a process similar to that for

* Seattle, Washington June 20 1934

isolating insulin It had no effect on the sugar in normal, fasting animals but reduced or completely suppressed the hyperglycemia following the administration of large quantities of dextrose to dogs and men and diminished the glycemia and glycosuria from epinephrine The most striking characteristic was an apparent storage, since the effects lasted several weeks after a single dose of 1 Gm Larger amounts did not increase this effect and were entirely non-toxic, as was also continual administration over long periods Furthermore, the blood-sugar of totally depancreatized dogs was stabilized by ingestion of myrtomel and the span of life was increased four to five weeks

Clinical experience, which was at that time much less striking, has not been particularly encouraging Of 81 diabetic patients, Allen found that 36 were benefited and in 6 it was possible to stop the use of insulin entirely (18 to 54 units daily) More recently he came to the conclusion that there is no definite insulin-replacing effect Myrtomel was afterward placed on the market for experimental purposes, but its subsequent withdrawal and abandonment would seem to indicate that others could not get satisfactory results in diabetes

Others have attributed similar properties to extracts of various plants grapefruit by Taylor and Atter (6), later refuted (7), fragrant sumac and bugleweed (8), alfalfa, clover, corn silk, etc (9), species of *Vinca* (10) Poole, in an unpublished work here, found similar results from extracts of *Gaultheria shallon* (salal), of *Vaccinium ovalatum* and of *V parvifolium*

We started the present investigation to determine the nature of the substance responsible for this power to reduce the amount of sugar in the blood

EXPERIMENTAL

Rabbits, which were used as test animals, were kept on a standard diet which was satisfactorily adequate and under conditions as nearly ideal as possible The withdrawal of blood for analysis was made at fixed times of day and under equal conditions otherwise

After a large number of trials, it was found that the normal amount of sugar in the blood could be placed approximately at 0.109 ± 0.009 per cent using the Shaffer Hartmann method of determination (11) In a similar series of experiments it was found that 0.5 mg of epinephrine gave about 0.176 per cent sugar in 90 minutes and 0.196 in 120 minutes, while 1 mg of epinephrine gave 0.278 and 0.294 per cent respectively, in the same times

An extract was made from the leaves of salal by Allen's method and fed to rabbits in a dose of 1 Gm daily (equivalent to 50 Gm of leaves) for several days No effect could be observed on the level of blood sugar nor on epinephrine hyperglycemia which was produced every day during the experiment Subcutaneous injections of the extract, equivalent to 60 Gm of the leaves were likewise without effect, as were also injections of fractions made by dialysis and of aqueous and alcoholic extracts of the leaves In no case could active material be found

Similar negative results were found with *Vaccinium ovalatum* In no instance could any extract or fraction be found to alter the normal level of blood sugar or that after action of epinephrine We are convinced after hundreds of experiments that the solutions made in various ways have no power to reduce the amount of sugar

In view of the circumstances it seemed advisable to repeat some of the work on myrtomel Allen (5) described preparations from two species of *Vaccinium* but the myrtomel later used by experimenters came from an unknown source and according to the manufacturers the species used is immaterial Consequently, a sample of leaves from *V dumosum* was obtained from near Sudbury, Massachusetts extracted and tested on rabbits Again results were entirely negative since orally or by injections no effect on blood sugar either normal or after epinephrine, could be obtained by amounts equal to 50 Gm of leaves

At this stage the problem began to take on a different light and we were forced to consider

it from the negative viewpoint. Possibly such preparations from plants do not have an effect on sugar metabolism, in spite of reports to the contrary. With this in mind, it was decided to repeat the earlier work of Collip (1).

An alcoholic extract was made from green onion tops and concentrated according to his method. This was injected daily as before in amount equal to 20 Gm. of original material. There was made also an aqueous extract from the onion tops and injected in the same amount. Although many such tests were performed, we could never note any change in the normal amount of sugar nor in the level after injection of epinephrine.

Exactly similar results were obtained with fresh lettuce leaves (25 Gm. daily) and with fresh cabbage leaves (20 Gm. daily). In all cases the methods of preparing the extracts were according to Collip.

In order to make the matter still more convincing, we tested some of these preparations on a depancreatized dog. The animal lived for more than five days, during which time there were injected at various periods extracts equivalent to 100 Gm. of huckleberry leaves, to 100 Gm. of salal leaves and to 60 Gm. of fresh lettuce leaves. In no case was the curve of blood sugar altered. Insulin was capable of lowering the amount of sugar but could not prevent death in coma on the sixth day.

The interesting observation by Collip that hypoglycemia could be transmitted from one animal to another next engaged our attention. He found that, if a rabbit was rendered low in blood sugar by insulin, by plant extracts, by guanidine derivatives or by starvation, injection of its serum or defibrinated blood would confer a similar condition on a second animal.

An attempt was made to confirm this for insulin. A rabbit, given 20 units of the latter by injection, was in a state of violent convulsions three hours later. While in this condition it was bled and the blood was defibrinated by whipping. A second rabbit was injected with 10 cc. of this product and then observed for more than a week. The amount of sugar in the blood was normal at all times and it exhibited no unusual symptoms. Several repetitions of this experiment gave the same result.

DISCUSSION

From a study of the results herein contained and those of previous experimenters, we are forced to conclude that the reputed therapeutic value of plant extracts in the control of sugar is erroneous.

Collip's work may be criticized from the standpoint of the quantity of liquid injected and of the five days of starvation. He reports the injection of 50 to 90 cc., which would probably dilute the blood considerably and also cause a shock to derange the general metabolism. Furthermore, he observed a reduction in sugar in the case of some extracts but was often unable to get a similar result with the same materials in other animals. It appears that the effects obtained were due to the condition of the subject rather than to a specific constituent of the extract. If there was such a constituent, consistent results should be obtained. In the earlier work on insulin an active extract invariably exerted its effect on all animals within six hours. Some of Collip's extracts did not develop a subnormal blood-sugar until five days after injection and, since food was withheld entirely during the course of the experiment, it is obvious that the reduction in sugar was due to starvation.

Thakimer and Perry (2) noted from 5 cc. of raw potato juice intravenously a reduction of sugar from 0.17 down to 0.13 per cent. They did not state the method of determination but it is evidently one capable of considerable error, or the amount found for normal would not be so high. One experiment only was reported and it would seem inadvisable to draw any exact conclusion therefrom.

Winter and Smith (3) used extracts of yeast from various sources. Of 17 experiments reported, only 3 showed lower than normal amount of blood-sugar and an attempt to repeat one of these resulted in failure.

In view of these facts, our own experiments and a careful survey of other literature, it seems to us entirely reasonable to question the existence of any evidence that plants contain a substance which will alter amounts of sugar in the blood

SUMMARY

No evidence could be found for the reputed activity of plant extracts in reducing normal or high blood-sugar. Also no evidence could be found for any transference of hypoglycemia from one animal to another

REFERENCES

- (1) Collip, *J Biol Chem*, 55, 39, 56, 512, 57, 65, 58, 163 (1923-1924)
- (2) Thalkimer and Perry, *Science*, 58, 120 (1923)
- (3) Winter and Smith, *Science*, 57, Suppl 12 (1923), *Biochem J*, 17, 683 (1923)
- (4) Best and Scott, *Jour Metabolic Research*, 3, 177 (1923), Chopra and Bose, *THIS JOURNAL*, 15, 558 (1926), Colin, *Ibid*, 15, 556 and 16, 199 (1926-1927)
- (5) Allen, *J Am Med*, 89, 1577, *Am Jour Physiol*, 81, 462 (1927)
- (6) Taylor and Atter, *Pharm J*, 120, 35 (1928)
- (7) *Ibid*, 120, 320 (1928)
- (8) Editorial, *J A M A*, 91, 586 (1928)
- (9) Mills, *Quart Jour and Yearbook of Pharm*, 1, 657 (1928)
- (10) Nye and Fitzgerald, *J A M A*, 92, 184 (1929), Corbhill and Douth, *Ibid*, 94, 1447 (1930)
- (11) Shaffer and Hartmann, *J Biol Chem*, 45, 365 (1921)

SUGGESTIONS FOR THE IMPROVEMENT OF PROFESSIONAL RELATIONS BETWEEN DENTISTS AND PHARMACISTS *

BY C L WHITMAN, D D S

The professions of Dentistry and Pharmacy have been very closely related since their beginning. It is my purpose to point out some of the reasons for and method by which the pharmacists and dentists may cooperate to their mutual advantage.

In the United States there are about 67,000 dentists, all of whom prescribe drugs to a certain extent. But as a rule, while drugs are used often they are not prescribed as effectively or skilfully as they might be. I do not mean to condemn the dental profession as a whole, but this condition exists more frequently than it should. Dentistry has been practised for centuries but not as we know it to day, modern dentistry, as a distinct and separate profession, was born in 1839 when the Baltimore College of Dental Surgery, the first dental school in the world, was established in Baltimore. Dentistry and medicine were from that year practically divorced and while dentistry, in its early days, depended largely on medicine for its development, its fundamental studies are at present based on biology, exactly as is medicine or any other branch of the healing art. Before this first dental college was established few specific books on dental therapeutics existed, the little knowledge concerning the action of drugs was scattered through the few dental works which existed at that time, or was closely guarded by its possessors. Since then dentistry has rapidly forged ahead—great strides have been made and dentistry is continuing to progress.

* Section on Education and Legislation, A P H A, Washington meeting, 1934

As the profession of dentistry has advanced and become more of a factor in the healing art, it has been increasingly exploited by many unscrupulous manufacturers, preparations, concerning which little or nothing is stated as to their formulas, are being constantly brought to the dentist's attention. This condition, I believe, is in a great measure unconsciously encouraged by the dentist because much of his prescribing is done by word of mouth. This is due in part to inadequate training in this particular subject in the dental schools and by the constant pressure upon the dentist through detail men and the advertising of preparations concerning which little or nothing concerning their make-up is stated. The American Dental Association is not unaware of this condition and accordingly it has established a Council on Dental Therapeutics. The purpose of this Council is to acquaint the profession with preparations and drugs which are of use to dentistry and also to expose those preparations which are useless or unacceptable. The results of their findings are reported each month in the *Journal of the American Dental Association*. These findings will be compiled in a book similar to the N N R of the American Medical Association and represent a great forward stride in dental therapeutics.

One of the ways in which pharmacy and dentistry can work together is through personal contact of individuals of both professions. The pharmacists who are conducting the pharmacies may suggest to dentists with whom they are acquainted ways in which they may prescribe drugs to better advantage. Dentists, on the whole, are eager for information, to cite a concrete example of just what I mean—let us take sodium perborate, which is one of the drugs a dentist might wish to prescribe. Five years ago he prescribed it and expected a patient to buy and use it. Nowadays a patient knows what sodium perborate is and he will substitute some flavored and colored perborate put up under a trade name, because he knows what the official perborate is, and that it tastes bad. Manufacturers, quick to see this, retail the drug under various names and flavors. Pharmacists might suggest to the dentist that he add color and an essential oil to flavor the preparation. The psychological action of the prescription would then be retained and, after all, this is one of the most important actions of a drug.

This may sound very simple to pharmacists but that is your profession. You know how to handle coloring materials, flavors and vehicles and know how to prepare drugs in some more palatable and pleasing form. You are experienced in the use of these things but the average dentist, at best, has probably only read of them.

In most dental schools a practical working knowledge of these drugs is not given, the students read of them in books. They may see the drugs, but they do not have the opportunity to prepare and combine drugs as in the preparation of a prescription. Because of this, the dentist lacks confidence in writing prescriptions and encouragement or suggestions from the pharmacist to the dentist would be of mutual benefit.

Another phase in the relationship between pharmacists and dentists would be in the field of laboratory diagnosis, there is an increasing demand for pharmacists who are trained and equipped to do this work. As dentistry is becoming more of a "preventive" science there is greater necessity for dentists to have a better knowledge of the patient's general physical condition, hence, the need for laboratory tests will become greater in the coming years. In advocating this, I do not mean in any way to infringe upon the practice of medicine, but I do feel that there is much that

can be done, which will not necessitate the physician's viewpoint. To cite an example of this. In the case of gingival necrosis, commonly known as pyorrhea, with a knowledge of the blood sugar it would be possible for a dentist, before undertaking any treatment, to know whether he would obtain a favorable result. By having a white count and a granulocyte count it would be a very simple matter to differentiate between a Vincent's infection and granulocytosis, without the blood count it means a great loss of time, which could be prevented and much error in diagnosis eliminated.

This brings up another means by which the professions may cooperate. As dentistry is conscious of its weakness in this phase of its work it has taken steps to correct it by the establishment of the Council on Dental Therapeutics. Because of the work of this Council and the interest aroused the dental colleges are giving and will, in the future, give this subject more prominence in their curricula. In the meantime there are many graduate dentists who would like to know more about the subject and postgraduate classes should be encouraged. These classes would, in my opinion, be of great value and could be sponsored by pharmacy and dental schools. I refer at this time to a course for dentists that was promoted by Prof. George C. Schucks of the New Jersey College of Pharmacy of Rutgers University. This was probably the first time such an effort has been made. This course consisted of six lectures and was attended by about thirty-five dentists. The course was devoted to dental drugs and a part of the course to the enlightenment of dentists as to what is being used in proprietary drugs. Needless to say the course was enthusiastically received. I do not mean to imply that schools of pharmacy should gratuitously establish such courses for dentists. However, there are men in the profession of pharmacy who are better fitted to teach the subject—it is their vocation and because of their general knowledge of pharmacology they may be able to suggest more efficient and effective drugs than those being used. If such men could be made available to dental societies and study groups much good could be accomplished.

Finally, I would earnestly urge that the study of your vocation never cease and that you continuously strive for improvement. A few days ago my attention was directed to a survey in the state of Michigan as a foundation to formulate a plan for socialized medicine, *i. e.*, all the divisions of public health service. In this survey it was determined that that time out of school had its influence on the individual's knowledge. This was discovered as a result of examinations consisting of questions that the average practitioner should be able to answer, it was found that the longer the average man had been out of school, the less he knew. While much is being done in the way of postgraduate work, journalism, study groups and conventions, the unfortunate part is that the man who needs this help most is the one who does not take advantage of the opportunities offered.

The author of the paper interspersed the discussion by references to the value of individual and group contact, establishment of laboratories and improvement of general knowledge.

The 30th annual meeting of the American Association of Museums will be held in Washington, D. C., headquarters at the Smithsonian Institution, May 23-25, 1935.

The AMERICAN PHARMACEUTICAL ASSOCIATION is listed among the Museums in Washington.

THE SUCCESSFUL APPLICATION OF U S P AND N F PUBLICITY IN A
RETAIL PHARMACY *BY LAWRENCE S WILLIAMS ¹

In opening his presentation the author expressed his regret that he did not promote professional pharmacy earlier. He spoke of a number of clippings from various publications, among them one by Samuel C. Davis, read before Tennessee Pharmaceutical Association, on the value and importance of manufacturing U S P and N F preparations by retail pharmacists in the saving of costs and establishing professional relations with the doctors. Another paper, by C. O. Bigelow, was referred to, the latter had presented fifty copies of the Pharmacopœia to physicians and of these forty-nine thanked the donor, one inquired relative to the purpose of the Pharmacopœia. Another paper was by H. A. B. Dunning on the glycerophosphate preparations, all of these were referred to by the author as they awakened in him the desire to practice pharmacy more extensively and establish a prescription practice. It was this effort which enabled him to carry on.

Mr. Williams referred to the publicity of Maryland pharmacists among physicians and stated that this was producing results. He presented for consideration and thought that pharmacists should attend hospital conferences, get acquainted with the interns and medical staff, attend meetings of medical societies, pharmaceutical meetings, displays should be made at meetings and cooperative efforts should be promoted.

The author discussed the publicity developed by him, letters addressed to physicians were addressed by pen, not by rubber stamp. Among the preparations with which physicians were detailed included, "Infusion of Digitalis," "Basham's Mixture," "Stokes Expectorant," etc. Prior to the opening of the schools, he prepared a special letter on "Vaccine Virus" and while many obtained this from the Health Department, he sold well over two hundred packages each year.

The substance of a letter addressed to doctors by Mr. Williams on "Service" is included.

' DEAR DOCTOR

"In solicitation of your patronage I submit a service, planned to meet the requirements of modern pharmacy in its relations with the medical profession

' A service which does not usurp the prerogatives of the physician,

"A service which combines adequate equipment and efficient management designed to carry out your directions,

"A service which furnishes the highest quality of prescription chemicals,

"A service which regards your patient as a sacred trust,

A service which insures prompt delivery of your orders,

"A service at reasonable prices, which upon your recommendation will be adjusted to meet special circumstances of your patient,

' A service which invites your inspection "

A card, with address and phone number, addressed to prospective patrons of the section of Baltimore in which the pharmacy is located follows

* Section on Practical Pharmacy and Dispensing. A. P. H. A. Washington meeting 1935.
Abstracted

¹ Deceased

"THE PHARMACIST'S CREED"

'I have given years of my life to study and training
 I fill your needs day and night at times without profit—at times without
 pay
 'I offer many courtesies and helps not known of except in pharmacies
 'I am accurate conscientious and capable in compounding your prescriptions
 'I aid your physician in every way possible
 I endeavor to earn the trust that you and your physician place in me
 I am
 (Signed) Your Pharmacist,
 L S WILLIAMS "

The author explained other means of publicity adopted and used by him and, in closing, stressed the importance of cooperation

Some of the show globes jars balances and mortars donated by our late fellow member are shown on page 947 in the September JOURNAL, A PH A 1934 The Williams Pharmacy is shown elsewhere in this issue of the JOURNAL



Mortars and Pestles, and Drug Jars Purchased by J Leon Lascoff from the Wanamaker Collection

Mortars and Pestles —1, bronze 18th century, north of England, 2-4, bronze, French, 18th-19th century, 5, Spanish, 16th century, 6 bronze, 4 rigid projections 17th-18th century, 7, bronze, bossed with female mascarons, 17th-18th century, 8, plain bronze, 17th-18th century, 9, bronze Spanish, 16th century

Jars —1, 2 Paris, decorated porcelain, about 1800, 3 4, Italian Majolica, spouted, 17th-18th century, 5 6, 7, 8, Urbino, 18th century, 9, Pesaro Pharmacy bottle globular, Tankard George I, silver, with inscription, Petley Ley, London, 1719 —Descriptions given above are in complete, but sufficient with the illustrations to show the importance of this valuable purchase now in the Pharmacy of our fellow-member

A PHARMACEUTICAL STUDY OF p_H *BY FREDERICK F. JOHNSON ¹FORMULATION OF p_H

Applying the law of mass action to an acid, HA, which ionizes according to the equation $HA \rightleftharpoons [H^+] + [A^-]$, we find that an equilibrium exists according to the equation

$$\frac{[H^+][A^-]}{[HA]} = K_a,$$

in which K_a = the dissociation constant of the acid. The dissociation constant of a base is given by the corresponding equation

Water dissociates to an extremely small extent according to the equation $H_2O \rightleftharpoons [H^+] + [OH^-]$. Applying the law of mass action to this dissociation, we obtain

$$\frac{[H^+][OH^-]}{[H_2O]} = K_w$$

The concentrations of H^+ and OH^- in pure water or in dilute aqueous solutions are so small compared with the concentration of undissociated water molecules, that the concentration of the latter, $[H_2O]$, may be considered as constant during the dissociation. The equation then becomes $[H^+] \times [OH^-] = K_w$. The value of K_w at 25° C has been found to be 1.0×10^{-14} (5), (6) (7), (8), (21), (31). In pure water, the concentrations of the H ions and the OH -ions must remain equal. Therefore,

$$[H^+] \times [OH^-] = [H^+]^2 = [OH^-]^2 = 1 \times 10^{-14}$$

Then, $[H^+] = [OH^-] = \sqrt{1 \times 10^{-14}} = 1 \times 10^{-7}$. This equation means that pure water or a neutral aqueous solution at 25° C contains 1×10^{-7} moles of H -ions and 1×10^{-7} moles of OH^- ions per liter and is a 1/10,000,000 normal solution of both H - and OH -ions.

For practical reasons, hydrogen ion concentrations are expressed as the logarithms of their reciprocals. A common logarithm is an exponent to the base 10. Thus the symbol p_H signifies "hydrogen exponent." The definition of p_H may be given mathematically

$$p_H = -\log [H^+] = \log \frac{1}{[H^+]}$$

Since the hydrogen ion concentration varies in a definite reciprocal manner with hydroxyl-ion concentration, the p_H scale may be used to express degrees of alkalinity as well as degrees of acidity, as in the following synopsis.

From this data it is seen that, while the p_H values vary according to arithmetic progression, the corresponding hydrogen ion concentrations vary according to geometric progression.

Acidity	Concentration of H or OH Ions	Alkalinity
p_H 7 (neutral)	$N/10,000,000$	p_H 7 (neutral)
p_H 6	$N/1,000,000$	p_H 8
p_H 5	$N/100,000$	p_H 9
p_H 4	$N/10,000$	p_H 10
p_H 3	$N/1,000$	p_H 11
p_H 2	$N/100$	p_H 12
p_H 1	$N/10$	p_H 13
p_H 0	$N/1$	p_H 14

* From the University of Washington College of Pharmacy. A thesis submitted as part requirement for the degree of Master of Science in Pharmacy under the direction of H. A. Langenhahn.

¹ Fairchild fellow for 1934-1935.

FORMULATION OF BUFFER CAPACITY

It would be of little value to discuss in this paper the action of buffers, however, since there are many references in the pharmaceutical literature to a very valuable formulation of buffer effect, this one expression will be explained here. Van Slyke (53) has adopted a unit for the buffer capacity of solutions. This unit is the differential ratio $\frac{dB}{d(pH)}$ expressing the relationship between the increment (in gram equivalents per liter) of a strong base B added to a buffered solution and the resultant increment in pH. An increment of strong acid is equivalent to a negative increment of base, or $-dB$. In these terms, a solution has a buffer capacity of 1 when a liter will take up 1-Gm equivalent of strong acid or alkali per unit change in pH. If a base is added the pH is increased, so that both dB and d(pH) are positive. If acid is added, both dB and d(pH) are negative. The ratio $\frac{dB}{d(pH)}$ is therefore, always a positive numerical value. This is called Van Slyke's ratio and is often designated by B. When this ratio is applied, for instance, to tinctures and fluids, extracts, and when the buffer capacity is plotted with the quantities of acid as ordinates and the corresponding increments in pH as abscissa, the curve is usually a straight line within reasonable limits. From such a graph we obtain the ratio $\frac{\Delta B}{\Delta(pH)}$ where each of these values is a measurable increment. Within the limits of the straight line curve, the buffer capacity obtained using the measurable increments is identical with that of the differential ratio $\frac{dB}{d(pH)}$. Van Slyke's ratio is much used in adjusting pharmaceutical preparations to specified pH values.

FORMULATION OF ELECTRODE POTENTIALS

The most direct formulation of an electrode potential is as follows. If a metal is put in pure water, some of the metal dissolves forming positively charged ions, and consequently, the remaining metal assumes a negative charge. Three principal forces are present—the solution pressure of the metal, the electrostatic force of the charged ions, and the osmotic pressure of the solution. An equilibrium of the forces is soon reached. Assume an electrode, such that 1 Gm mole of ions of charge n , carrying nF faradays of electricity (a faraday is the number of coulombs carried by a gram equivalent of an ion) pass from the electrode to the solution, increasing the partial osmotic pressure by dp . Thus n is equivalent to the valence of the metallic ions. The change in potential difference between the electrode and the solution will be dE . The electrical work expended will be $nFdE$ and the work taken up by the system will be Vdp . Therefore, $nFdE = Vdp$.

According to the laws of an ideal gas $V = \frac{RT}{p}$ in which p = pressure in atmospheres, V = volume in liters, R = the gas constant and T = the absolute temperature. Thus by eliminating V , $dE = \frac{RT}{nF} \frac{dp}{p}$. Integrating gives $E = \frac{RT}{nF} \log_e p + c$, where \log_e is the natural logarithm to the base e and c is some integration constant. In dilute solutions, p is equivalent to the activity of the ions. By introducing known values for R and F ($R = 8315$ international joules and $F = 96500$ coulombs) and, by transposing the natural logarithm into the common logarithm by multiplying by 2.3026, $E = 0.0001984 \frac{T}{n} \log_{10} c_{ion} + C$. Thus at 25°C $E = \frac{0.0591}{n} \log_{10} c_{ion} + C$. C may be eliminated by equating E against e_0 (normal potential of the metal that is the difference in potential between it and the normal hydrogen electrode in a solution whose ion activity is equal to 1). The normal hydrogen electrode is defined by international agreement according to the following specifications:

"The potential at a hydrogen electrode under one atmosphere pressure of hydrogen in a solution of unit hydrogen activity shall be considered zero at all temperatures."

By eliminating the integration constant C , we arrive at the fundamental equation for converting electrode potentials to hydrogen ion concentrations $E = e_0 + \frac{0.0591}{n} \log_{10} c_{\text{ion}} (25^\circ \text{C})$

HISTORY OF METHODS

The electrolytic dissociation theory of Arrhenius (2) and the application of the law of mass action to ionic equilibria marked the beginning of hydrogen-ion control. The dissociation constant of water was determined in various ways by Ostwald (5) Wjys (6) Nernst (7) Kohlrausch and Heydweiller (8), Sorensen (21) and Lewis, Brighton and Sebastian (31). These steps furnished the basis for the mathematical conception of hydrogen ion concentration. Sorensen (21) suggested that the numerical values of the negative exponents of hydrogen ion concentration values be adopted as the basis of an acidity scale and recommended the symbol P_{H^+} . Clark (110) introduced the simpler symbol p_H , which is now used more extensively.

Pertaining to the potentiometric method of determining p_H Nernst (3) Peters (10) and Crotochino (12), using the ideal gas laws (59) and Faraday's laws of electrolysis have shown the logical derivation of a common expression for all electrode potentials. The hydrogen electrode was first used by Bugarszky and Liebermann (9) who applied it to a biochemical problem. Later, a thorough treatise on the hydrogen electrode was published by Huldebrand (25). The calomel electrode was developed through the early efforts of G. N. Lewis and his colleagues (20), (31), (59). Our fundamental information regarding the quinhydrone electrode is largely due to Bulmann (39), (40), (56). The development of the glass electrode dates back to Helmholtz (1), who, in 1881 first constructed a glass electrode. The further development of this electrode was carried on by Haber and Klemensiewicz (19) and Kerridge (76).

The first survey of indicators suitable for hydrogen ion determinations was performed in Nernst's laboratory in 1904 by Salessky (15). The results of this and many other surveys were summarized in Salm's famous table (16). Then came the classic work of Sorensen (21) in which he eliminated a vast number of faulty indicators and organized a series of indicators suitable for biological work. Clark and Lubs (29) also selected a series of indicators which was composed mostly of sulphonphthaleins.

HYDROGEN ION CATALYSIS

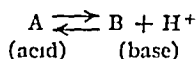
Most drugs can be classified into two groups on the basis of optimum p_H stability: those having maximum stability at $p_H 7$ and those having maximum stability very near $p_H 5$. This suggests two distinct factors affecting the relation between hydrogen ion concentration and stability of drugs. Stability in the absence of acidity or alkalinity is easily understood, but stability at $p_H 5$ must be explained on the basis of hydrogen ion catalysis.

The majority of reactions in solution appear to be catalyzed by hydrogen ions and hydroxyl ions. The experiments of Arrhenius (4) on the inversion of sucrose by weak acids in the presence of the corresponding salt gave results which showed that the catalytic activity of acids in aqueous solution is approximately proportional to the degree of dissociation as determined by electrolytic measurements. Later Arrhenius (11) found that the rate of inversion of sucrose by weak acids was greatly augmented by the addition of the neutral salts of strong acids, for example KCl increased the catalytic activity of CH_3COOH . Arrhenius, therefore postulated that dissolved salts increase the dissociation constants of weak acids in solution. (Takeuchi and Horikoshi (295) have recently shown that while KCl and $NaCl$ increase the rate of sucrose inversion by acids, K_2SO_4 and Na_2SO_4 decrease the rate of inversion.) In 1900 Euler (13) proposed a theory describing the catalytic effect of hydrogen ions and hydroxyl ions as an instantaneous salt formation. This conformed to the view commonly held (but certainly not justified) that ionic reactions are more rapid than reactions between electrically neutral molecules. In 1913, Stieglitz (26) proposed a theory agreeing with that of Euler.

The view that the catalytic effect represents the result of two simultaneous changes involving a hydration of the hydrogen ion and a change in the non-ionized acid was developed by a number of workers (17) (18) (22) (24), (27). This became known as the dual theory of acid catalysis and served as the first conception of the addition products formed between hydrogen ions and other substances. Kendall (43) developed this theory and postulated that the number of catalytically active particles is much greater than is ordinarily supposed. He recognized several

types of hydrogen ions, such as H^+ , $[H_2O]^+$, $[HCH_2COOCH_3]^+$, $[HClHO]$, $[HCHCOOH]^+$, etc., existing in a complex series of equilibria and each possessing a different catalytic activity. Rice (61), in 1923, recognized such equilibria and ascribed the catalytic effect of hydrogen ions to the free ions and correspondingly to the free or unhydrated hydroxyl ions. This leads to the conclusion that stoichiometrically neutral water is distinctly alkaline catalytically, and it is not until the hydrogen ion concentration has a value of about $p_H 5$ that the concentrations of the unhydrated ions become equal and the catalytic activity is at a minimum.

The views which are most in vogue today were put forward by Bronsted (109), in 1928. Bronsted first contended that the law of mass action cannot be applied in its classical form to ionic reactions. He developed a new mathematical conception of hydrogen ion catalysis and a new definition of acids and bases. The new definition is represented by



The mechanism of hydrogen ion catalysis can then be visualized as being a transfer of a proton from catalyst to substrate (acid catalysis) or from substrate to catalyst (basic catalysis). The success of Bronsted's hypothesis consists in its ability to predict the changes in reaction velocity due to the addition of other molecules and ions by calculating the change in concentration of the complex between the reacting substances. Bronsted's work has been verified by later investigators.

The existence of various hydrogen ion complexes is associated with the so-called "activities" of hydrogen ions. The term hydrogen-ion activity, will be returned in this thesis.

Olivier and his co-workers (321), (322), (323) have recently published data concerning the relation of the nature of the substrate to its sensitiveness to hydrogen ion and hydroxyl ion catalysis.

EFFECT OF ELECTROLYTES ON p_H

Electrolytes have considerable influence upon both the p_H and the stability of solutions. The fundamental effect of electrolytes is by no means understood. Some of the most valuable data concerning the effects of electrolytes will be cited.

Thomas and Baldwin (34) claimed that electrolytes increase the acidity of acid solutions in the following order: $MgCl > LiCl > NaCl > KCl = NH_4Cl > BaCl_2 > MgSO_4 > Na_2SO_4 > (NH_4)_2SO_4$. The sulphates decrease the acidity. Lepper and Martin (87) stated that the influence upon p_H of the cations of univalent alkali metals varies inversely as their atomic weights. They found that NaCl reduces p_H and reduces the activity of anions which results in an increased dissociation of any acids which are present. To account for their results they assumed that NaCl increases the dielectric constant of water. Loeb (33) advanced a theory which assumes that neutral salts with univalent or bivalent cations assume a charge which is negative with reference to that of water particles and that neutral or acid salts with trivalent or tetravalent cations assume a charge which is positive with reference to that of water particles. Taft and Malm (228) found that in alkaline gum arabic solutions the presence of neutral salts increases the p_H values. Northrop (45) found that neutral salts decrease the p_H of acid gelatin and increase the rate of its hydrolysis. Britton and Dodd (257) found that NaCl in a concentration as high as tenth normal does not affect the p_H of alkaline sodium hypochlorite solution. Taketomi and Horikoshi (295) stated that the rate of inversion of sugar by acids is increased by NaCl and KCl, but is decreased by Na_2SO_4 and K_2SO_4 . Schmidt (176) claimed with regard to the flocculation of diphtheria toxin and antitoxin, that there is a range of electrolyte concentration in which no flocculation occurs. Above or below this range flocculation does occur.

PHYSIOLOGICAL p_H

Reaction of Distilled Water—It is well known that distilled water of $p_H 7.0$ is seldom obtained. Water is considerably acid after one distillation and soon becomes alkaline "during storage in ordinary glass." Acree and Fawcett (142) found that the solids and carbon dioxide in once distilled waters gave them p_H values of about 5.0–5.5. Only by repeated distillations in tin apparatus and in filtered and carbon dioxide free air can water be obtained of p_H about 6.9. By this method the authors obtained their so-called "super pure water" having a specific conductivity

of 0.04×10^{-3} at 18°C Acree and Fawcett included tables which showed the errors in p_{H} caused by the dilution of buffers with ordinary p_{H} 5.0 distilled water and with p_{H} 5.7 air carbon dioxide equilibrium water. Williams and Swett (55) obtained fresh, distilled water of p_{H} 6.8 after 48 hours in contact with air the p_{H} became 5.23. Stock glucose solutions had a p_{H} of less than 5.0. Bruck (193) has observed the change in p_{H} during storage of water not in contact with air. Freshly distilled samples had a p_{H} of 5.65, when stored in ordinary corked glass the p_{H} reached 9.00 in 20 days. After standing 12 days more exposed to the air, the p_{H} was 7.80. Freshly distilled water was sterilized in Hageda ampuls and, in 5 weeks the p_{H} changed from 5.55 to 7.5–8.0. Distilled water was placed in corked flasks of Jena glass and, within 4 weeks, the p_{H} remained between 5.4 and 5.5. Matthews (217) reported that water which was sterilized and stored in washed Jena ampuls for 2 years increased in p_{H} from 6.2 to 6.4–7.0, and increased in total solids by 0.0048 Gm per liter. Klobusitzky (273) has devised a method for testing glass ampuls to determine if their reactions are suitable.

Adjustment to Blood p_{H} —Human blood has a p_{H} range from 7.3 to 7.5, being fairly constant at p_{H} 7.4. p_{H} values for blood or tissues above or below these figures are not compatible with life. A patient becomes comatose if a p_{H} of 7.1 is reached or convulsive with a blood p_{H} above 7.5. Jacobs and Parpart (210) reported that hemolysis by hypotonic solutions was measurably increased by p_{H} changes of as little as 0.01 unit. It is important, therefore, that the p_{H} of solutions for injection be as close as possible to 7.4 and that the p_{H} values of these solutions remain stable during sterilization.

Physiological salt solution, when prepared with ordinary distilled water, has been found by Williams and Swett (54) to be dangerously acid. Fleisch (49) has criticized Ringer's and Tyrode's solutions, claiming the first to be too acid and the other too alkaline. He reported the following method for preparing a stable sterilizable nutritive solution of physiological p_{H} . To 10.5 Gm NaCl, 0.5 Gm KCl, 0.3 Gm CaCl_2 , 0.1 Gm MgCl_2 and 5 cc $\text{N H}_2\text{PO}_4$, add H_2O q. s. to 58.7 cc. Filter, add 50 cc of this to 1 liter of water and sterilize. Then saturate with oxygen and add 5 cc of sterile N Na CO_3 . Hansen, Schou and Tonnesen (268) found that invert sugar solutions have a p_{H} of about 3.0 when the inversion occurs during sterilization in sealed ampuls. Williams and Swett (54) reported that 10% glucose solutions of p_{H} 8.58 became as acid as p_{H} 4.9 when boiled or autoclaved. In a later publication (55), they stated that when these solutions were buffered to a p_{H} of 7.4 with KH_2PO_4 and K HPO_4 , there were no unpleasant reactions following their free use.

In the same article they reported the p_{H} values of various sterilized commercial solutions. They found that a sodium citrate solution used in a transfusion where a violent reaction followed had a p_{H} of 10.25. Solutions of dyes for intravenous and intramuscular injection had a p_{H} of 5.0. When properly buffered 10–40% more of these dyes were excreted. Solutions of arsenphenamine, tetanus antitoxin and antipneumococcus serum were all too alkaline.

The sterilization of cocaine hydrochloride is always accompanied by increased acidity. Roy (78) reported p_{H} values of cocaine hydrochloride solutions, as follows: 1% solution, 5.20; 2% solution, 4.50; 3% solution, 3.75. The p_{H} of the 1% solution, sterilized for 30 minutes at 100°C became 4.60. Regnier and David (285), (286) observed the p_{H} change of cocaine hydrochloride solutions during and after sterilization. The p_{H} values dropped from 5.9–6.0 to as low as 3.4 after 80 days' storage following sterilization. The authors pointed out the dangers of the pharmacological use of such acid solutions. In a later publication (287) the authors found that when the cocaine hydrochloride is buffered to a weakly acid reaction by Na_2CO_3 and NaH_2PO_4 or NaH_2PO_4 and Na_2HPO_4 the p_{H} remains stable during sterilization.

Dietzel and Huss (111) have found that alkaline or soluble glass causes considerable p_{H} change during the sterilization of morphine hydrochloride solutions. The instability caused by the hydroxyl ions was found to be catalytical. They recommended the use of Jena or quartz glass. Roy (78) found that novocaine solutions become dangerously acid (p_{H} 4.2–4.3) during sterilization. Later Rae (223) suggested that the only safe way of sterilizing novocaine solutions is by filtering through a Chamberland filter fitted with Jena glass. Goldberg (266) stated that the p_{H} of procaine hydrochloride mixed with epinephrine can be stabilized between p_{H} 5.7 and neutrality by a water solution of Na_2HPO_4 and NaH_2PO_4 .

Roy (78) claimed that the hydrogen ion concentrations of all hydrochlorides of amine alcohols increase considerably during sterilization, producing small quantities of benzoic acid

Besides cocaine and novocaine, he considered in his article stovaine and atropine sulphate. During sterilization the pH of stovaine dropped from 5.40 to 4.0 and that of atropine sulphate changed from 6.45 to 5.70. Macht and Shohl (37) have noted that benzyl alcohol solutions when sterilized or stored in soft glass containers, become dangerously alkaline and deteriorate rapidly. They recommended that the solutions be highly buffered to pH 7.0-6.8 and sealed in hard glass containers.

Levy and Cullen (36) found that strophanthin solutions when autoclaved in commercial glass ampuls, changed in reaction from pH 6.0 to pH 9.0. They reported that solutions of strophanthin in 0.02 molar phosphate solution adjusted to pH 7 and autoclaved in hard glass ampuls retained a stable pH after 5 months.

Mulford and Greenbaum (132) have reported the change in pH by sterilization of many pharmaceutical products as follows: dextrose, more acid; glycerophosphate compound, more acid; iron cacodylate, less acid; magnesium sulphate, more acid; mercurochrome, more alkaline; physiological salt solution, more acid; procaine, more acid; procaine and epinephrine, more acid; sodium cacodylate, no change; sodium iodide and salicylates with colchicine, no change; sodium salicylate, more alkaline.

A general method for maintaining stable pH during sterilization was suggested by Robertson, Woo and Sia (62). Water was twice distilled and rendered CO_2 free by passing CO_2 free air through it for 24 hours. Solutions of 7.5 molar H_3PO_4 and 7.5 molar $NaOH$ were boiled and kept in bottles stoppered with soda lime traps. The solute (various drugs were used) was added to the water, the H_3PO_4 was added, 1 cc per 100 cc, and the solution brought to the desired pH by the addition of the $NaOH$ solution. When autoclaved, the solutions were only 0.1-0.2 pH lower and the pH values remained constant for 2-3 weeks. Benda (143) stated that by adding acid binding substances, such as caustic alkalies or soluble alkaline carbonates, phosphates or acetates, to solutions of salts of p -dialkylaminoarylyphosphinous acids, sterilizable solutions of stable pH are obtained.

Adjustment to Ophthalmic pH —The adjusting of pH is of considerable importance in ophthalmic therapy. Gifford and Denton (265) have recently conducted a detailed investigation of this problem and their results are summarized below. The reaction of the lacrimal secretions is about pH 8.0. An acid buffer solution suitable for ophthalmic drugs soluble only in acid media, such as zinc salts, phenacaine, cocaine and epinephrine, is made from the following formula: 6.2 Gm boric acid, 7.4 Gm potassium chloride and distilled water to 1000 cc. The pH of this solution is 5.5. An alkaline buffer solution is less irritating and is a suitable medium for atropine, homatropine, physostigmine and pilocarpine. It is prepared by adding 1 cc of a 0.20 molar sodium carbonate solution to 50 cc of the acid buffer solution. The pH of this solution is 7.6. The alkaline solution is, of course, a less irritating collyrium than the acid solution.

The authors stated that phenacaine is soluble in the acid solution only if the pH is as low as 4.8. Atropine, homatropine, physostigmine and pilocarpine are soluble in both solutions but are more effective in the alkaline solution. Zinc salts precipitate in the tears unless the medium is as acid as pH 5.5. Sodium fluorescein dissolves only at pH 9.0 or above. Metaphen is soluble only at pH 8.0 or above. This is the reaction of the 1:500 solution and the pH remains unchanged when it is diluted to 1:2500. Butyn is insoluble in either buffer solution but is soluble in distilled water.

Gifford and Smith determined the following pH values for ophthalmic preparations:

	pH		pH
1.0% atropine sulphate	5.8	4.0% procaine hydrochloride	4.6
2.0% homatropine hydrobromide	5.5	1:1000 epinephrine	4.6
2.0% cocaine hydrochloride	4.6	2.0% butyn sulphate	5.4
1.0% pilocarpine nitrate	4.8	0.9% sodium chloride	7.0
0.2% physostigmine sulphate	6.6	0.2% zinc chloride	5.0
1:1000 nupercain	4.4	Saturated boric acid	4.2

When these are dissolved in saturated boric acid their reactions vary from pH 4.2 to 5.0.

pH AND TOXICITY

Alkaloids—In 1921, Crane (41) pointed out that the toxicity of alkaloidal salts is dependent upon the degree of hydrolysis. He stated that it is not the salt or ion which is toxic and that

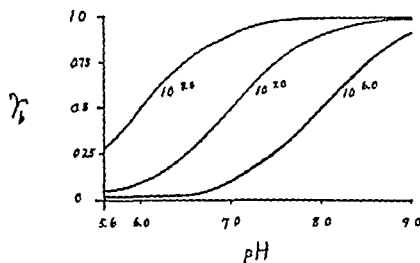
variations in the hydrogen ion concentration affect the toxicity of alkaloids by changing the proportion of free undissociated base in the solution, rather than by direct action upon the cell. He found that with most alkaloidal salts there was 100 times as much undissociated base at pH 8.0 as at pH 6.0. Mayeda (116) later derived a mathematical expression for the degree of dissociation of alkaloidal salts as a function of pH . Designating with T_b the degree of hydrolysis of a salt composed of a strong acid and a weak base (alkaloidal salt) with a dissociation constant K_b , and with K_w equal to the dissociation constant of water, it was shown that

$$T_b = \frac{K_w}{K_w + K_b [H^+]} \text{ or } T_b = \frac{K_w}{K_w + K_b 10^{-pH}}$$

This equation shows that T_b is independent of the concentration of the alkaloidal salt but is dependent upon the magnitude of the dissociation constant K_b , the base or free alkaloid playing the role of a parameter. Mayeda plotted these functions (cf. Fig. 1) with the degrees of hydrolysis as ordinates and the pH values as abscissas. Referring to the graph, it is noted that each curve has a turning point at which the degree of hydrolysis has the value 0.5. If $pK_b = 7.0$, the hydrolysis varies as follows:

pH	5.5	6.0	7.0	8.0	8.5
% of hydrolysis	3.2	9.1	50.0	90.9	96.9

Assuming that the free alkaloid alone is biologically active, the activity is almost twice as great at pH 8.0 than at pH 7.0. Using cinchona alkaloids, Mayeda experimentally verified his mathematical results. He concluded the following: 1. The biological action of cinchona alkaloids is dependent entirely upon the amount of alkaloidal base freed by hydrolytic dissociation which in turn is a function of the pH . 2. Only the free quinine base is the bearer of biological action.



Hydrolysis Curves of Alkaloidal Salts with
Dissociation Constant K_b 10^{-6} 10^{-7} 10^{-8}

Fig. 1

Gerlough (204) obtained the following results pertaining to the effect of pH on the actions of local anesthetics as measured by the rabbit cornea method. The duration of anesthesia produced by procaine hydrochloride, procaine borate and butyn increased with increasing pH . Duration of anesthesia by butesin picrate was unaffected by changes in pH . Butyn and procaine hydrochloride in buffered solutions had greater action than in unbuffered solutions of the same pH . Fosdick, Hansen and Dragstedt (151) also reported that an increase in alkalinity augmented the anesthetic properties of procaine and cocaine hydrochloride solutions. Their investigations showed that the efficiency of procaine borate and hydrochloride is practically the same at pH 8.4, but that the borate is more efficient at higher pH values and the hydrochloride is more efficient at pH values below 8.4. In general, these results with local anesthetic also point to increased biological activity when a greater amount of alkaloidal base is freed by dissociation.

Cosmetics—Eggerth (80) has published the results of a detailed investigation concerning the effect of pH on the germicidal action of soaps. Eggerth found for all soaps an acid and an alkaline range in which the soaps were most germicidal. Potassium butyrate was non-germicidal in a concentration of tenth normal at all pH values within the limits of 3.8 to 10.5. He stated that solutions of soaps having 12 or more carbon atoms in the molecule were alkaline in reaction, and that increasing the number of carbon atoms in the chain increased the alkalinity of the solution due to increased hydrolysis. With increasing molecular weight of the soap, the germicidal titer increased to a maximum and then diminished, the point of inflection varying with the pH and the organisms. Thus, with *B. typhosus* at pH 5.5 the titer rose with increasing molecular weights up to capric acid and then diminished. With most organisms the maximum titer for the acid range was reached with lauric and tridecyl acids. In the alkaline range the germicidal action increased

with molecular weight to the palmitate and then diminished. The lower members of the saturated series of soaps were found to be most germicidal in an acid reaction. For instance, the titer for potassium caprate was 1000 times as great at pH 4.4 to 4.7 as it was at pH 9.0 to 10.0.

Eggerth proposed the following explanations concerning the relation between pH and the germicidal action of soaps: 1. Hydrogen ions and hydroxyl ions may affect the bacterium rather than the soap. 2. An acid reaction may decrease the surface tension of the soap and thus increase its concentration at the surface of the bacterium. 3. The pH effect may be due to alterations of the solubility of soap in the aqueous phase or in the bacterial protoplasm. 4. The fatty acid may have a greater germicidal action because the acid is less dissociated than the soap and there is evidence that undissociated molecules penetrate more readily into protoplasm than do ions.

Janistyn (211) called attention to the value of certain acids (anisic, formic, benzoic, butyric, citric, acetic, gallic, tannic, glycerophosphoric, camphoric, etc.) in concentrations giving a therapeutic skin pH of 3.0 to 5.0 in soaps, skin, mouth and hair preparations and other cosmetics. Janistyn stated that the disinfecting action of buffered acids is greater than that of unbuffered acids because of the higher acid ion concentration. An anonymous article in the *Drug and Cosmetic Industry* (302) stated that the normal pH of skin is between 4.5-5.0 and that any cosmetic which has a strong alkaline reaction is detrimental to the skin. This article stated that the pH range of blood is from 7.0 to 7.4 and that face creams whose pH values deviate from this range cause irritation to the epidermis. The author also pointed out the existence of acid and alkaline ranges wherein an optimum effect can be obtained from antiseptic lotions. Mayer (320) has shown the value of pH control in the manufacture of shampoos and has stated that a properly designed soapless shampoo base should have a pH of about 7.0 to 7.5.

Preservatives and Antiseptics—The preservative action of acids and bases is in a large measure, a function of hydrogen and hydroxyl ion activity, and also, specific effects which were previously suspected of certain acids and bases have now been clearly demonstrated by the use of hydrogen-ion methods. The effects of these ions are greatly complicated by various conditions associated with the colloidal phases and degrees of permeability of cell membranes. The alteration of the colloidal phase conditions often depends upon the inorganic ions which are present. Thus, calcium favors the permeation of oil soluble substances and sodium of water soluble substances. An interesting feature of permeability is that weak acids or bases penetrate cells readily whereas strong ones fail to do so. The direct action of hydrogen ion concentration upon cells must be kept distinguished from its control of the effective state of a toxic compound. The relationship between pH and toxicity to microorganisms is discussed below in three phases: The preservation of foods, the preservation of drugs and the effect of antiseptics in therapy.

In 1929, Cruess and Richert (124) found that the concentrations of sodium benzoate required to prevent the growth of yeasts, molds and bacteria were greatly affected by the pH values of the medium. In a later publication (195) Cruess, Richert and Irish stated that the concentration of sodium benzoate necessary to give the same preservative action at the neutral point as at pH 3.0 was 200 times as great. Still later, Cruess (236) observed that for the destruction of fermentation organisms, 4% of sodium benzoate was required at pH 7.0, 0.06-0.1% was required at pH 3.5-4.0 and 0.02-0.03% was required at pH 2.3-2.4. He stated that some molds grew profusely in a 10% sodium benzoate solution of pH near neutrality. In asparagus juice *Clostridium botulinum* grew and formed toxin at pH 7.4 with 0.8 Gm. of sodium benzoate per 100 cc. The organism did not grow at pH 4.7 with 0.1 Gm. of the preservative per 100 cc. In regard to other salts of weak acids, it was stated that in the pH range 5.0 to 9.0 the necessary concentrations of sodium salicylate, sodium sulphite and potassium acetate were considerably higher than in the pH range 2.0 to 4.5. From these observations Cruess concluded that the undissociated weak acids, rather than their ions, are the preservative agents. This conclusion is in direct accordance with that of Eggerth (80) who stated that undissociated molecules penetrate more readily into protoplasm than do ions. Cruess' observation that lowering the pH did only slightly enhance the preservative actions of sodium chloride and formaldehyde also supports the conclusion of Eggerth.

In 1932, Back (233) reviewed the use of preservatives in pharmaceutical preparations. He stated that concentrations of vinegar, equivalent to 2.5-3.5% of acetic acid, are sufficient to prevent fermentation in sauces and similar preparations. Lactic acid is satisfactory as a preservative but there is evidence that citric acid in equivalent strength is less effective. He stated that in

addition to the p_H value, the nature of the anion affects the preservative properties. If sugar is used the concentration must be 66% or above. He also stated that, in general, a concentration of 8-15% of salt inhibits bacterial growth but that many yeasts grow in a 25% salt solution, even concentrated brine will not kill spores. Walbum (297) found that the resistance of earth spores to destruction was greatest at p_H 8-9 and quickly decreased on the acid and alkaline sides.

The effect of insulin solutions (20, 32 and 40 units per cc), without preservatives, and of a solution of 40 units per cc with 0.3% tricresol on the viability of *Staphylococcus albus*, was studied by Hartley (208). Solutions of p_H 3-4 had a germicidal action with no preservatives present. When the normal acidity of a solution containing no preservative was even slightly reduced, staphylococci were not killed and considerable growth occurred at p_H 6.0. When p_H 8.5 was reached, the solutions, in most cases, again did not allow growth of staphylococci. It seems that the insulin itself has a toxic effect on microorganisms because, on ordinary culture media, staphylococci develop most favorably in a slightly alkaline reaction and growth is not inhibited by p_H changes from 5-9.

With regard to the British Liquor Arsenicalis, Milne and Rattray (280) found that when organic matter was completely excluded during preparation, very little growth of molds occurred at temperatures suitable for their rapid development and that the growth was most at p_H 7.0.

Joachimoglu (57) has investigated the influence of p_H upon the antiseptic effect of mercuric chloride solutions buffered with glycolic acid, NaOH and HCl. The final dilutions of mercuric chloride were 1:672,000. There was strong antiseptics at p_H 3.3-4.0, no effect at p_H 7.8-10.1, a slight effect at p_H 10.5 and strong antiseptics at p_H 11-12 corresponding to that between p_H 3.3-4.0. When buffered with secondary sodium citrate and sodium hydroxide, positive antiseptic action was obtained between p_H 5.0-6.6.

Daniels and Lyons (196) have studied the effect of p_H upon the antiseptic actions of phenyl substituted acids from benzoic to ϵ -phenyl caproic. They could find no definite relation between p_H and antiseptic effect but did note that there was a gradual rise in p_H as the series ascended. They found the antiseptic actions of certain phenols to be strongest in an acid range below p_H 4.5 and in an alkaline range above p_H 10. They also stated that the undissociated acid molecule is the active portion in disinfection by means of acids, whereby the antiseptic action would be inversely proportional to the hydrogen ion concentration. Janistyn (211) claimed that the disinfecting action of acids is greater when they are buffered because of the higher acid-ion concentration. He cited experimental evidence to show that lactic acid and sodium lactate of p_H 3.7 in a concentration of 1:15 is equivalent in disinfecting power to 65% ethyl alcohol.

Kunzmann (275) has stated that hydrogen ion concentrations between p_H 6.5-7.5 had no effect upon the disinfecting properties of potassium iodide and sodium iodide solutions. He found that potassium iodide was more effective than sodium iodide but that the effect of both was decreased when they were mixed.

p_H AND STABILITY OF DISPERSED PHASES

Before entering into the discussion of the relation between p_H and the stability of drugs, it will be of value to consider the work performed by the Swiss pharmacists Tschurch and Fluck (119), (125) on instability caused by the presence of acacia. They have found that acacia contained one or more oxidizing enzymes and that these enzymes attacked most alkaloids and glucosides. The manner of action on morphine indicated that the oxidases attacked especially the free hydroxyl groups. Acacia, which had been inactivated, did not oxidize morphine. It was found that the oxidases of gum arabic were able to act in a pill mass with a moisture content of 2% or above. Tschurch and Fluck found that the acacia could be inactivated, as shown by the guaiac and benzidine test for oxidase, by boiling a mucilage to dryness, or by precipitating the gum with boiling neutral alcohol. The authors pointed out that precipitation of the gum by acid alcohol produced an inactive powder which after completely washing out the acid, would not dissolve in distilled water but which required an alkaline condition for solution.

Emulsions—The preparation of stable emulsions has been for many years a disconcerting problem. When emulsions were conceived as a fine dispersion of one liquid in another, the size of the dispersed particles was considered to be the only important factor controlling the stability. Later investigations have shown that a purely mechanical conception is not sufficient and that emulsion formation is affected by factors similar to those affecting colloid formation.

Different emulsifying agents have been found to cause opposite phase dispersions and to cause different ranges of stability along the p_H scale. Harkins (30) has stated that sodium oleate and similar compounds produce emulsions of the oil-in-water type, whereas calcium and magnesium oleates and other compounds in which 2 hydrocarbon radicals are attached to 1 metallic atom produce water-in-oil emulsions. Harkins found that emulsions produced by magnesium oleate disintegrated when the p_H of the aqueous phase became as low as 2.5. He attributed this disintegration to the decomposition of the emulsifying agent, which must be in contact with the dispersed phase. Krantz and Gordon (113) substantiated Harkins' results and stated that with magnesium oleate emulsions the most stable p_H range of the internal phase was between 11-12.5. The same authors (130) found that in magnesium oleate emulsions, the size of the dispersed particles varied between 17-30 microns. They also stated that with this type of emulsion, p_H did not significantly affect the surface tension, that there was a decided drop in viscosity on the acid and alkaline sides of the p_H range 0.9-13.0, that the emulsions in mineral oil were unaffected by the addition of sodium chloride but that the emulsions in olive oil were made less stable by the addition of sodium chloride. The authors concluded their discussion of magnesium oleate emulsions by stating that the most important factor in the stability of these emulsions is the influence of the hydrogen ion concentration of the dispersed phase upon the magnesium oleate.

Krantz and Carr (242) recommended the use of magnesium oleate in the preparation of Ointment of Rose Water because it produced a neutral, stable and compatible water-in-oil emulsion. They stated that all salts producing an hydroxyl ion concentration represented by p_H 9.17 or above produced satisfactory ointments.

Krantz and Gordon (86) (113) found that oil-in-water emulsions produced by acacia had a wide stability range within p_H 1.6-10.35, with greatest stability between p_H 4.11-4.28. The results were the same whether the oil was vegetable or mineral, or whether the acid used was hydrochloric or sulphuric. Addition of sodium chloride showed that the chlorine ion did not influence stability. The surface tension varied slightly with p_H , being a maximum at p_H 7.3 and decreasing by about 30% at the acid and alkaline extremes. Viscosity was unaffected by p_H . The size of the particles was smallest near p_H 7 and increased considerably with increasing p_H values and increased very little with decreasing p_H .

The same authors found that oil-in-water emulsions produced by tragacanth had a range of greatest stability within the p_H limits of 1.9-2.3 and had another, more narrow, and less stable range, at about p_H 6.3. Tragacanth emulsions differed also from acacia emulsions in that their viscosity decreased with increasing p_H . In considering gels of tragacanth, the authors found that only those between p_H 0.4-2.1 remained free from the separation of water at the surface. The most stable range of p_H for tragacanth emulsions lies within this scale. The authors claimed that this supports the hydrate theory of emulsions¹ which postulates that oil is most thoroughly emulsified in a hydrophile colloid when just a sufficient amount of water is present to form a hydrate. With tragacanth, according to Krantz and Gordon, this amount of water is evidently a function of its hydrogen ion concentration. Therefore, at the p_H value where tragacanth possesses the highest degree of hydratability, this value is the most stable point for emulsions prepared with tragacanth.

Krantz (129) has investigated the buffer actions of both acacia and tragacanth. The buffer capacity $\frac{\Delta B}{\Delta p_H}$ of acacia was found to be 0.034 and to extend over a wide range. Since acacia consists of the K, Ca and Mg salts of a weak acid its buffer capacity is more effective in the neutralization of acids than of alkalis. This was shown by Krantz when he plotted the buffer capacity (cf Fig 2). At p_H 10.5 the curve became very abrupt, but below 2.5 the curve descends as a gradient. This accounts for the extreme instability beginning on the alkaline side of the p_H stability range. Tragacanth exerted considerable buffer capacity between p_H 3.0-10.0. In view of the wide buffer capacities of these two emulsifying agents Krantz (165) attempted to increase their stability ranges by buffering the external phases. With acacia, no increase in stability was observed between p_H 2-10.5, but with tragacanth, the stable range of 1.9-2.3 was increased to p_H 1.9-5.0.

On account of the sharpness of the single break in the titration curve of acacia Taft and Malm (228) have claimed that arabic acid is evidently a strong monobasic acid. They explained

¹ Fischer, 'Fats and Fatty Degeneration,' page 5 (1917)

the viscosities, densities, freezing points and conductances of acacia solutions of widely variable concentrations by assuming that acacia acts as a strong organic electrolyte rather than as a colloidal phase when in contact with water. They attributed the protective action of acacia solutions to their high viscosity and to the probable high adsorption of the acacia molecules.

According to Friedman and Evans (203), the stability of gelatin emulsions is dependent upon the pH , and, to a small degree, the concentration of the gelatin. The stability range, in general, was between pH 3-6, with a few emulsions becoming very unstable near pH 3 when the gelatin concentration was as low as 0.25%. When the pH of the gelatin solution was near the isoelectric point (about pH 4.95), the most stable emulsions were formed. Stability sharply decreased at pH of about 3.0, there was another point of increased stability near pH 2.5, and a sharp drop in stability when the pH was further decreased. Addition of alkali resulted in a marked decrease in stability above pH 6.0, with another range of stability near pH 8-10, and another decrease when the pH rose above 11. A summary of these results shows that there are two pH ranges for stability, one from pH 3-6, and the other in the vicinity of pH 8-10. This is in accordance with the results of Kraemer (85), who reported finding two isoelectric points for gelatin, one at pH 4.95, and the other near pH 8.

Enz and Jordan (239) reported the following results after investigating the ease of emulsification of alkaloid containing preparations. Fluidextract of Belladonna Leaves showed least emulsification at the neutral point, Tincture of Stramonium and Fluidextract of Cinchona showed least in acid solution, and Fluidextract of Hydrastis and Tincture of Nux Vomica showed no uniformity. According to the authors:

"The results indicate that the statement, emulsions are less apt to form in strongly acid or alkaline solutions than in those which are neutral, is true only in specific instances."

According to some experimental work reported by Weeks (185), at pH values less than 7.0, the area of a water spread emulsion for a given pressure increased with time without reaching an equilibrium. At pH values above 7.0, the area finally became constant with time but the values were large and were dependent upon the pH . At pH 7.0, the water spread emulsion showed a constant area with time for a given pressure and quickly reached the equilibrium.

Colloids—Unless conditions are favorable, a colloidal solution may be a very transient system. There are many pharmaceutical colloids representing and acting as transition cases between the two practical classes of colloidal solutions. Thus, gelatin, acacia, albumen and mercury ointments represent the class of reversible or lyophile colloids, and metallic suspensions and the two silver protein preparations represent the irreversible or lyophobic colloids. A consideration of the stability of colloidal solutions reveals two important stabilizing agencies, solvation and electric double layers, the former being typical of lyophiles, the latter of lyophobic.

Considerable work has been done concerning the effect of acid base equilibria on the stability of colloids. Those colloids of the lyophile class representing mostly the effects of macromolecular solvation, are less affected by ionic phenomena than are those of the lyophobic class. Electric double layers are responsible for the stability of most hydrosols of inorganic substances in the absence of protective colloids and these layers are sensitive to the charges of electrolytes. According to theory, as two particles carrying electric double layers approach each other the outer layers are deformed or polarized and an electrical repulsion results. The electrokinetic potential necessary to prevent adhesion is considered to be about 15-25 millivolts. Since the potential of non ionic and sparingly soluble ionic particles in water is not so large, stability usually requires the presence of a definite amount of an electrolyte, one ion of which is adsorbed by the particle.

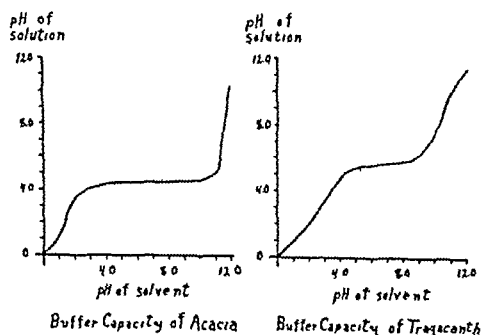


Fig 2

In 1922, Bogue (46) showed that various physical properties of colloids, including the viscosity, jelly strength, melting point and joining strength, were a minimum at a pH corresponding to the isoelectric point. As the acidity or alkalinity increased from this point, these properties rose in value. In 1925, Johnston and Peard (75) determined the isoelectric point of gelatin as pH 4.7. The surface tension was a maximum at this point and a minimum at pH 3.8-4.0, and in the neighborhood of pH 9.0. A second maximum was found at pH 2.8-3.0, below which the surface tension steadily decreased. Addition of electrolytes also lowered the surface tension. A year later, Kraemer (85), using the Tyndall effect to designate the isoelectric point of gelatin determined the point as pH 4.9, the Tyndall effect indicating a maximum tendency to precipitate at this point. He suggested a second isoelectric point near pH 8 where there was a distinct decrease in light dispersion. The maximum gel strength appeared on either side and very near to the optimum precipitation point, or isoelectric point, illustrating that gel formation takes place under conditions which are just adjacent to those leading to readiest precipitation or coagulation. Kraemer stated that, contrary to the usual assumption, the gel formation was very small within a narrow range at the isoelectric point.

Recent literature reflects considerable interest concerning the effects of hydrogen ions and other ions on the swelling of gelatin. This phenomenon has nothing to do with the decomposition of gelatin or with the destruction of the colloidal state, but rather it is caused by the production of a higher osmotic pressure within the separate particles of gelatin, due to a Donnan equilibrium set up between the particles. Concerning this subject the reader is referred to J. Loeb¹ and Miller and Pleass (131) (173).

Many workers have studied the influence of hydrogen ions on the coagulation of colloidal solutions. Ghosh and Dhar (82) have explained the coagulation by electrolytes of solutions of ferric hydroxide, chromium hydroxide, mastic and gamboge, according to the following principles: 1. Adsorption of ions carrying the same charge as the sol. 2. Hydrolysis of the sols and consequent generation of acids which stabilize the sols. Addition of acids renders the sols unstable by checking their hydrolysis, but addition of alkalis increases the stability by increasing the hydrolysis of the sols. 3. Hydrolysis of the coagulating electrolytes.

The explanation of coagulation which has been offered by Hazel and Sorum (209) is similar but more readily acceptable. They claim that for a positive sol (there are both positive and negative sols), the anion of the added electrolyte is the effective agent in producing coagulation. Hence the flocculation values for monovalent ions are higher than for bivalent or trivalent ions. The authors determined the effects of the following groups of electrolytes upon ferric oxide solutions:

1. Univalent salts
2. Bivalent salts represented by $BaCl_2$
3. Trivalent salts represented by $FeCl_3$ and $AlCl_3$
4. K_2SO_4 , $(NH_4)_2SO_4$, $CaSO_4$
5. K_2CrO_4 and $K_2Cr_2O_7$
6. $K_3Fe(CN)_6$ and KH_2PO_4
7. $K_4Fe(CN)_6$

The flocculation values decreased for Groups 1, 2 and 3 respectively. In Groups 1, 2, 5 and 6, the flocculation values decreased with increasing hydrogen ion concentrations. The effect of electrolytes of Group 3 did not vary with pH , both electrolytes being salts of a strong acid and weak base, whereby their hydrolyses produced a constant pH . The flocculation values of the electrolytes in Group 4 increased with increasing hydrogen ion concentrations. Bedford, Keller and Gabbard (256) have also reported that the presence of sulphates caused the stability of ferric oxide solutions to vary inversely with the hydrogen ion concentration.

Morton (220) has performed electrometric studies which have revealed the complex formations and colloidal conditions of pharmaceutically important iron compounds. Electrometric titrations were performed to determine the cause of the non-precipitability by volatile alkalis of solutions of iron "citrochloride". This was found to be due to the formation of the basic colloid complex, $FeC_6H_5O_7 \cdot 2Fe(OH)_3$. In the absence of complex formation, that is, without the addition of citric acid or alkali metal citrates, the red color of basic iron salts was exhibited at pH 2.2 and

¹ "Proteins and the Theory of Colloidal Behavior" (1924)

at pH 2.36 the solution became colloidal. Coagulation occurred at pH 6.48. This indicated that only in strongly acid solutions can the ferric ion exist in an appreciable concentration.

Morton reported that Fehling's solution consists of a basic colloid-complex, $3CuC_4H_4O_6 \cdot 5Cu(OH)_2$ peptized by excess of tartrate ion. He explained that the cataphoretic behavior of the hydrosol is due, not to the presence of complex anions, but to the negative colloid-complex.

In a later work, Morton (221) reported that in pharmaceutical mixtures of the ferric chloride sodium salicylate bicarbonate type the iron is present partly as a violet crystalloid complex, $Fe(OH)(C_6H_4OHCOO)$, and partly as a red basic hydrosol, the proportion of the metal present in each form depending on the degree of acidity or alkalinity. In acid solutions, the hydroxy-acid complexes of iron were found to be present mainly as true electrolytes, but in alkaline solutions they were decomposed to varying extents with the formation of basic hydrosols. Their apparent stability in alkaline solution was assumed to be due to the peptizing and protecting properties of the hydroxy acid anion.

pH AND STABILITY OF COMPLEX PRODUCTS OF BIOLOGICAL ORIGIN

Proteins—The vast amount of investigation dealing with the structure of proteins have given rise to much information concerning the effect of pH upon the decomposition of proteins. Although most proteins do not require stabilization, the general principles concerning their decomposition are of wide scientific interest and can be applied to the problem of stabilizing toxins, antitoxins and insulin.

Northrop (45) has studied the decomposition of gelatin and has reported that in acid solutions of pH less than 2.0, the velocity of hydrolysis was directly proportional to the hydrogen ion concentration, and that in alkaline solutions of pH greater than 10.0, the velocity was directly proportional to the hydroxyl ion concentration. Between pH 2.0 and 10.0 the rate of hydrolysis was approximately constant and was much greater than would be calculated from the hydrogen and hydroxyl ion concentrations.

In 1930, Svedberg (181) published some generalized results related to the pH stability regions of proteins. He found a number of proteins to be monodisperse, that is, homogeneous as to molecular weight. They were divided into two groups, the first containing those with molecular weights from 34,500 to 208,000, the second containing those with molecular weights in the millions. Those of the first group fell into four classes with molecular weights 1, 2, 3 and 6 times 34,500. The monodisperse proteins had a wide stability region, usually between pH 3-11, and including the isoelectric point of the protein. This point was never in the middle of the stability region but was always shifted in the direction of the low pH values. The protein molecules containing more than one group of weight 34,500, split into molecules of $1/2$, $1/3$, and $1/4$ of the original as the pH value was raised. At sufficiently high alkalinity all proteins had the molecular weight 34,500. The same results were obtained by lowering the pH . This decomposition was reversible in many cases. When the mixture was restored to a pH within the stability range, molecules of the original weight were built up out of the fragments.

Sjogren and Svedberg (178) found that egg albumen was stable with regard to molecular weight in the pH range 4-9. The decomposition was measured by the velocity of sedimentation caused by ultracentrifuging. At pH values below 3 the sedimentation increased, indicating the formation of aggregates of denatured proteins, at pH values above 9 the sedimentation decreased, indicating the breaking up of the molecules. The molecular weight was determined as 34,200.

Svedberg and Heyroth (137) studied the pH stability of hemocyanin, which has molecular weights of 5,000,000. The molecular weight was constant between pH 4.5-7.4. As these limits were approached the protein molecules became hydrated, and as the limits were exceeded they rapidly disintegrated into smaller particles of undetermined magnitude. The acid disintegration was reversible in its earliest stages but the disintegration of the products first formed continued slowly and was irreversible in its later stages.

Nasset and Greenberg (133) have studied the rate of hydrolysis of casein in acid solutions. They claimed that the effect of acids was catalytic in nature and reported that the hydrolysis was proportional to the hydrogen-ion activity of the acids. The velocity constant for the three acids used decreased in the following order: HCl , H_2SO_4 , H_3PO_4 . The rate of hydrolysis conformed to the equation for a reaction of the second order.

In 1925 Brownlee (73) generalized his observations concerning the stability of toxins and

lysins by stating that the optimum pH for the stability of these substances varied from pH 6-7.5. His observations showed that the decomposition at ordinary temperatures was slower on the alkaline side than on the acid side. Schmidt (176) reported that diphtheria toxin was stable at $18^{\circ}C$ between pH 6.5-9.0, while at pH 5.4 or 9.9 the antigenic power was slowly destroyed, even when the temperature was $0^{\circ}C$. At $37^{\circ}C$ and pH 7.0 the antigenic power was destroyed. Flocculation by mixtures of toxin and antitoxin was prevented when the mixtures were freed from electrolytes or when the electrolyte content exceeded certain limits which varied greatly with different concentrations. The flocculating power of the antitoxin decreased with increasing temperature and alkalinity. The condition was reversed by acidifying. Schmidt stated that diphtheria antitoxin was much more stable to the destructive action of salts than was the toxin, and that salts of oxidizing and reducing acids and of certain aromatic acids completely destroyed both the toxin and antitoxin. Neutral salts had almost no influence.

With regard to tetanolyisin, a component of tetanus toxin, Schreck (292) stated that acidification decreased the rate of heat inactivation of the lysin and that alkalization accelerated the heat inactivation. Acidification of the lysin to pH 4.0 decreased the rate of oxidation, and acidification below pH 4.0 increased the rate of oxidation. Acidifying to pH 3.0 caused considerable inactivation in the absence of heat or oxidation. This indicates maximum stability of tetanus lysin near pH 4.0.

Much work of a similar nature has been done concerning the decomposition and precipitation of serum proteins (81), (100), (156), (180).

Remesow (174) has achieved some interesting results bearing on the coagulation of lecithins and cholesterins. The solutions of both were lyophobic colloidal solutions of suspensoid character. The coagulation limit for cholesterins was pH 4.0, for cholesterol esters, pH 2.0, and for lecithins between pH 6.2-5.6. The flocculation optimum for lecithin solutions lay between pH 2.8-2.0. A large number of substances, the most important biologically such as egg white, hydrocarbons, alkaloids, ferments, etc., were found to sensitize the lecithins and cholesterins in such a manner that their coagulation values were displaced to different pH values. Tables were included which showed the precipitation or lack of precipitation of cholesterins, cholesterol esters, lecithins and hydrolecithins at various pH values and under the sensitizing actions of more than 50 physiologically important substances and drugs. This so-called sensitizing action was proved to be one not between the substance and the sensitizer as in ordinary precipitation.

Hormones—Krogh and Hemmingsen (111), in 1928, reported that the optimum pH range for insulin stability was between pH 2.0-4.0. This optimum range has been modified later. The authors reported a distinct alkaline shift during decomposition and stated that the solutions became opalescent above pH 4. Gaddum (152) also found the stable range for insulin to be from pH 2.0-4.0 and reported exceedingly rapid decomposition above pH 7.0 and below pH 1.0. In 1931 Sjorgren and Svedberg applied ultracentrifugal methods for measuring the decomposition of insulin and thereby determined the pH range for optimum stability to be between pH 4.5-7.0. Near the borders of this region the decomposition was reversible. By ultracentrifugal means the authors determined the molecular weight (35,100), sedimentation constant, molar friction constant and molecular radius. The values were very nearly identical with those for egg albumen. Mogilskii (218) has reported that the isoelectric point of insulin was between pH 4.3 and 5.7, depending upon the purity of the solution.

Freudenberg and Eyer (201) have investigated the destructive action of acids and alkalis on insulin. The extreme instability to alkalis was evidently due to the cleavage of 2 molecules of NH_2 . One molecule of NH_2 was attacked by oxidizing agents and the other by reducing agents. Acids caused separation of NH_2 by hydrolysis. Wintersteiner (298) found that by varying the pH between 6.0-8.0, and using cysteine, thioglycolic acid and alpha thiolactic acid as reducing agents, with all three compounds the rate of inactivation of insulin increased with increasing pH .

The control of pH is of special importance in the preparation of pituitary extracts free from animal protein. Whenever the protein is precipitated a certain amount of the pituitary principles is destroyed. It is desirable to obtain a pH value whereby the best possible compromise can be attained between the amount of protein destroyed and the amount of active principles remaining. The original work was done by Dudley (32), Abel and Nagayama (35), and Strick (90) who pointed out the acid lability and the extreme alkaline lability of both the oxytocic and vasopressor

constituents of pituitary Abel and Nagayama observed that the acid destruction of the extracts caused the formation of histamine which produced a lowering of arterial pressure instead of the desired increase Gaddum (152) stated that for the oxytocic principle the effect of variation of the pH was a minimum between pH 7-8, but that the absolute optimum pH for stability was 3.0 The presence of salts caused a very small increase in destruction Gaddum summarized his results in a table which gives the amount of destruction of the oxytocic principle to be expected, when a solution of any pH is heated at any given temperature for any given time

Gerlough (153) carefully measured the amounts of inert protein which were precipitated by various reagents and at various pH values when the pituitary extracts were placed in boiling water for 12-14 minutes These results are summarized in Fig. 3 and can be compared with the pH stability curve for oxytocin formed from Gaddum's data for the same temperature and same duration of time The tungstic acid curve shows the greatest precipitation of protein but this reagent must be excluded because only 30-40% of the oxytocic principle remains after treatment A comparison of the two graphs shows that although the maximum stability occurs at pH 3.0-3.4, the maximum precipitation of inert protein which allows only a reasonable decomposition of the active principle can be obtained when the extract is adjusted to pH 4.4 with acetic acid

The hydrolysis of acetyl choline was investigated when a relation was suspected between it and the oxytocic pituitary principle Gaddum (152) found the optimum pH for its stability to be 3.9 Hofmann (157) found that the hydrolysis of acetyl choline chloride solutions produced an acid reaction which gradually checked the hydrolysis The least hydrolysis occurred at pH 3.9 with considerable hydrolysis occurring at pH 5.0 The cleavage of acetyl choline was considerably depressed by the addition of non electrolytes, such as antipyrine and acetamide The effect of acid upon the racemization of *l*-epinephrine has been investigated by Had-dock (267) In 10% hydrochloric acid, a solution of *l*-epinephrine was completely racemized in 12 hours, but in normal hydrochloric acid (3.6%), racemization was only 58.5% in 216 hours In the latter case, 10% was destroyed by oxidation In HCl solutions of pH 1.4, the racemization of 1% epinephrine was negligible even with exposure to ultra violet light Barker, Eastland and Evers (234) found that the oxidation of epinephrine by potassium persulphate was most rapid at pH 5.6, the rate of oxidation being one-fourth as great at pH 4.7 and 7.1 The presence of small quantities of copper greatly increased the rate of oxidation and iron showed a slight inhibitory effect

Marshall (278) stated that the p factor of the gonadotropic hormones lost 50% of its activity in 17 days when adjusted to pH 7.0 and preserved with 0.5% phenol

Vitamins—The experimental work concerned with the stability of vitamins can best be summarized in the following table The experiment represented by the first tabulation for the B₂ factor, in which no decomposition occurred, was performed upon a liver concentrate

Enzymes—A discussion of the relation between pH and the activity of enzymes is far beyond the scope of this paper It is sufficient to say that each enzyme has an optimum pH for action and that changes in enzyme activity with changes in pH are evidently related to the state of ionization of the substrate and the enzyme References are (21) (23) (51) (67) (73) (101), (104), (117) (207) (232) (283)

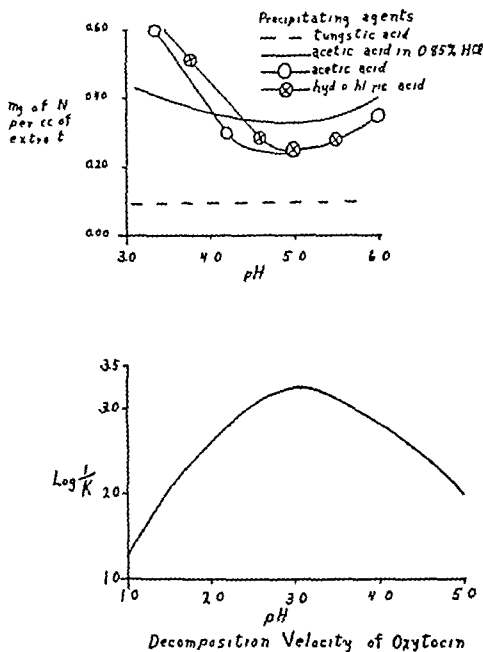


Fig. 3

Vitamin Factor	Temperature	Time in Hours	pH	% Decomposition	Reference
B ₁	100°	24	1 0	0	126
	120°	1	6 0	0	135
	100°	1	5 2	10	89
	100°	1	7 9	30-40	89
	100°	24	5 0	50	126
	100°	1	9 2	60-70	89
	100°	1	10 9	90-100	89
	125°	30 min	9 0	100	205
	120°	1	9 0	100	135
	125°	3	9 0	0	205
	120°	1	9 0	0	135
	90-100°	2	5 0	0	145
	25°	24	0 05-0 10	0	170
	119°	4	2 5	0-10	146
B ₂	25°	10 days	9 5-10 0	30	145
	98-100°	2	8 3	50	145
	123°	1-5	5 0	50	145
	123°	1-5	3 0	50	145
	122-125°	4-5	8 3-10	75-100	145
	120-125°	4	10 0	100	147
	119°	4	9 6-10 3	100	146
	20°	1-5 days	Alkaline	10-40	150
	120°	1	6 0	50	135
	60°	1-5 days	Neutral	100	150
	120°	1	9 0	100	135
	120-125°	4	9 0-10 0	0	147
	25°	14 months	1 6-2 2	0	186

Northrop (38) found that pepsin in solution at 38° C attained an optimum stability at pH 5.0 with slow destruction occurring at lower pH values and very rapid destruction at higher pH values. The inactivation of the pepsin was not reversible. Loughlin (277) claimed that the rate of heat inactivation of pepsin was a minimum and was almost constant within the pH range 3-4.5. Vahlteich (93) stated that Elivar of Pepsin of the N. F. formula deteriorated 100% during 2 years, but when no hydrochloric acid was added the elivar deteriorated only 36% in the same period of time. The author stated that the pH of the elivars which lost their entire activity was close to the optimum pH for peptic digestion (pH 1.2-1.6).

Pace (172) reported the optimum pH for trypsin stability as pH 6.5. The optimum pH for trypsin activity is 7.5-8.3. McGillivray (166) reported the optimum pH for the thermal stability of pancreatic lipase as pH 6.0. The optimum pH for lipase activity varies from 5.0-8.5, depending on the source.

(To be continued)

THE CHEMISTRY OF THE HORMONES

Under above title the *Journal of the American Medical Association* (March 30th) states:

"Although the question of the chemical nature of the hormones has been a subject of interest for nearly two decades, progress in this field has been exceedingly difficult because of the lack of endocrine preparations of sufficient purity for accurate chemical studies. Recent extensive investigation, however, has led to vastly improved methods of preparation and ultimately to the isolation

in pure crystalline form of a number of the hormones. Thus these heretofore inaccessible substances have been brought within the scope of attack by the chemist. Indeed, at present several hormones have been prepared in crystalline form and the chemical structure and method of synthesis of two of these have been definitely established. Also a number of other hormones have been prepared in a highly purified although noncrystalline state and some information regarding their chemical properties has been obtained.

THE DEPARTMENT OF THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY

C B JORDAN—CHAIRMAN OF EXECUTIVE COMMITTEE, A A C P EDITOR OF THIS
DEPARTMENT

Habitat learned by "brute memory" is easily forgotten while habitat associated with geography, history and travel will be easily learned and not easily forgotten. Dr. Wirth has presented, in the following paper, excellent suggestions for associating drugs with geographical locations. Such suggestion followed and expanded will add interest and pleasure to the teaching of a phase of pharmacognosy that can easily become burdensome.—C. B. JORDAN, *Editor*

THE TEACHING OF HABITATS IN PHARMACOGNOSY *

BY ELMER H. WIRTH ¹

In the learning of habitats the average student associates with the name of the drug, the name of a geographical locality, a name having some familiarity perhaps, but which in the end means nothing more than just another name for him to memorize. These facts, however, must be learned and in some cases "brute memory" seems the only solution. Yet, in many cases, we may perhaps find methods of association which will not only ease the student's burden, but will create within him a desire to think. And after all the thinking student will be a far greater credit to his profession than the one who has learned "à la parrot fashion."

In the teaching of habitats such desirable association may be created. The best way perhaps involves the instillation of some geographical knowledge along with the discussion of the drug. This after all is not a difficult task as most students display considerable interest in information concerning foreign lands. It can be done in three ways. *First*, by accounts of the history, collection and commerce of the drug, with mention of the topography and the locality of the region where it is found or cultivated. If the drug is one mentioned in the Bible, the Travels of Marco Polo, or other historical or travel work, familiar to the student, his interest is automatically excited. A second way involves the use of pictures. This brings into play a visual aspect of what was expressed above. The free use of photographs, or preferably lantern slides, in illustrating accounts of the commerce of drugs makes an invaluable combination.

A third way concerns maps. The drug map represents a more or less extended geographical area and presents a collective picture of the traffic in drugs. It has been our experience that considerable may be accomplished with maps. The Pharmacognosy Museum contains an habitat case holding some two hundred samples of crude drugs, each sample being attached by means of a streamer to its locality on a large world map. Various other cases in the museum contain small maps illustrating particular features in the traffic of the drugs displayed.

Our laboratory manual in Pharmacognosy is of the loose leaf type to facilitate its being combined with the laboratory notes and drawings. Into this manual we have inserted six outline continent maps, corresponding in size to the pages of

* Parts of a paper read before Teachers' Conferences, A. A. C. P., Washington meeting 1934.

¹ Assistant Professor of Pharmacognosy, University of Illinois College of Pharmacy.

the manual. The continent maps are preferable to a single world map in that crowding is eliminated. As each drug is considered its habitat is briefly discussed, taking into consideration the country yielding it together with its cultivation and commerce. The student enters the habitat in his notes, at the same time indicating its location by printing or writing the name of the drug on the proper map.

This method at once accomplishes several things. The maps give the student a graphical picture of pharmacognostical and ecological distribution over the various parts of the earth. His interest in geography is renewed as he sees its connection with other divisions of learning, particularly his chosen profession. He begins to accept a collective picture in which several relationships are orientated. His general knowledge is increased. His interest is stimulated. And finally, he retains his habitats with much less effort because he has diverged from the forceful mechanical association of terms which mean little more to him than combinations of letters, to a logical method of proper association.

The question naturally arises as to the value of habitats. They comprise but a minor part of pharmacognostical instruction and undue stress should not be placed upon them, especially at the expense of other more valuable instruction, yet, as has been explained, they offer a link in the association between pharmacognostical and other knowledge. They comprise, therefore, a division which the teacher should not overlook, in his effort to create interest in his subject. After all, when pharmacy goes before the public annually during Pharmacy Week, what is the center upon which the great majority of displays are built? The drug map.

Should students who have not had a thorough course in physiological chemistry be taught one phase of it such as urinalysis? To day the physician is not satisfied with urinalysis alone but he usually wishes a more complete analysis involving blood analysis, gastric analysis, etc. However, there is still perhaps a demand in certain localities for the pharmacist who is able to do simple urinalysis. If so then such a course should be offered in the college of pharmacy. The following paper by Professor Greene and a discussion by Professor Gershenfeld will be of special interest to the instructor who is called upon to offer a course in urinalysis.—C. B. JORDAN, *Editor*

TEACHING URINALYSIS TO STUDENTS OF PHARMACY

BY ANTOINE E. GREENE *

Perhaps this paper should be prefaced with an apology. If the present and future curricula in pharmacy are to be governed by the stern mandates of the Fourth Edition of the Pharmaceutical Syllabus, there will be no place for a course in Urinalysis, and this paper will be but a reflection of the ancient history of the subject.

It is the prayerful purpose of this paper to utter a protest, to enter an appeal. There is always the fundamental need for the consideration of local situations. In this period of tremendous transition in our education methods, we should be governed by the rule of curricular elasticity. While, in the main, we should attempt a firm adherence to unified basic and professional subjects, we should have open minds to receive and understand a "theory of elasticity" in the setting up of elective

* Associate Professor of Pharmacy, School of Medicine, Howard University, Washington

courses for our student body. Cast iron courses in a cast iron curriculum, with little chance for change or diversion, for student participation or interest in the choice of electives, are to be deplored. These straight and narrow curricula sterilize the students' interest, enthusiasm and ambition. It is our high hope that urinalysis remain as an acceptable elective, perhaps fortified if possible by the addition of blood chemistry, to become the equivalent in hours and credit of the course in biochemistry as outlined in the current syllabus.

In our course we attempt to acquaint the student thoroughly with the modern technique involved in the routine examination of normal and pathological urines. The student learns by doing. He examines his own urine to acquaint himself with a normal urine picture. The instructor examines each student's urine to determine whether or not the urine is normal for now and then, a case of an abnormal urine is discovered.

The preparation of diagnostic reagents for the use of physicians is emphasized. Since many physicians conduct chemical examinations of urine in their office laboratories, we feel that the pharmacist should be prepared to furnish the busy practitioner with those reagents which he needs and frequently calls for.

In those qualitative tests, where a reaction has a known chemical explanation, such chemistry is brought to the attention of the student by pointed illustration. Where possible, the reasons for adding this and that, and the explanation of the resulting color or precipitation are carefully outlined and elucidated. Each student is urged to make use of the library facilities and the use of modern textbooks and journals is encouraged for there are assignments which can only be completed outside of class.

From the normal urine, the student is led to the examination of abnormal specimens. Samples of pathological urines are obtained from the laboratory of an associated hospital and occasionally, private physicians submit specimens for both qualitative and quantitative examination. Time does not permit any extensive consideration of microscopic or bacteriological urinalysis. It is the purpose of the course to ground the student in the chemical examination of urine, and to do that well.

While our classes are made up of students who have had preliminary courses in the biological sciences, we review in lecture the anatomy and physiology of the excretory system and briefly touch upon the metabolism of the fats, carbohydrates and proteins in the human body in order that biological activities be understood from the viewpoint of interpretative urinalysis.

While the class meets for sixteen didactic hours and sixteen 3 hour laboratory periods per semester, by rotation of samples each student examines at least one hundred specimens. We consider it a good practice to have the students check each other's results. This makes for a wholesome rivalry. Some students bring in samples of the urines of their friends and delight to "diagnose" the ailments of their friends. The first we encourage, the second, we condemn. The function of the lay analyst of urine is to report findings, not to diagnose disease.

There is also a good natured rivalry with the medical students who are studying physiology and physiological chemistry, and it may be honestly said that our students in pharmacy possess a better understanding of the technique of urinalysis than their fellow students in medicine. In fact, we have had several medical students elect our course as a foundation for future work in junior pathology. Several of our graduates have written to the college wishing to pursue such work as we now give in urinalysis, although appending a desire for comprehensive instruction in blood chemistry.

We attempt to inject the elements of interest in the course from the very beginning. As our students check in their desks we have them take an actual inventory of the supplies and materials furnished them. This gives them an appreciation of the approximate cost of the necessary apparatus for setting up their own laboratories. The cost of preparing diagnostic reagents is also estimated, so that the student may compare the actual cost of preparation with the list price charged by commercial firms. This, we believe, vitalizes the subject with an added interest. The student is inspired with the idea that he may capitalize his professional knowledge by meeting the professional demands of the medical practitioner. And so it should be.

If in the new order of things the young medical practitioner comes to realize that his fellow

pharmacy graduates in the after-graduation era can aid him in the service of the public health, an *entente cordiale* will be established for the mutual good of medicine and pharmacy

Perhaps we may be deluded, but our students manifest an enthusiasm for the work which is most gratifying when many of the major and required courses are considered by them to be necessary evils along the scholastic path to a diploma

A case in point might well be related One student found that his urine contained a large amount of indican He admitted to irregularity and a heavy protein diet From this diet he changed to a vegetable diet containing much roughage Evidently his experiment must have been very successful for not only did his indicanuria disappear, but his entire physical appearance changed for the better Often during the stress and uncertainty of examination time, we come across an emotional glycosuria And with many other conditions of physical and psychic stress and strain we uncover temporary abnormalities by way of urinalysis These cases are interesting as they point out conditions discussed in the lectures and recitations

Some students exhibit a desire for the more advanced laboratory methods connected with the clinical analysis of urine These students are assigned *first*, to library research and *second* the preparation of the more delicate reagents Where possible these students are given individual instruction in the use and care of instruments of precision employed in urinalysis It is our policy to allow these students to prepare the reagents in quantity which are to be used by the class Special meetings are held when discussion of any question pertaining to the subject matter of the course may be entered in by students and members of the faculty We call these conferences—symposia, and they are most interesting and valuable to all those who attend and take part in them

In our experience we have found two or three interested students who were fitted for these advanced assignments and it has been our policy to encourage to the fullest extent such interest by a personal participation in the student's problems In all work of this kind we lay emphasis upon integrity, patience and accuracy

It has often been said facetiously that a difficult test in a clinical laboratory examination becomes a 'sink test' That slur upon the laboratorians of our hospitals is slowly dying the deserved death of unrighteous error In the future, it will be forgotten because of the honest and efficient service of a group of trained men and women, wholly devoted to honest and efficient laboratory analysis as a fundamental and necessary aid to the diagnosis, treatment and prevention of disease

If it could be possibly arranged a well constructed course in clinical laboratory methods might well be substituted for the present optional course in biochemistry as outlined in the syllabus This course should be carefully organized, with a view to pointing the lectures and recitations to the utilization of facts in the laboratory This course should consist of lectures, recitation, conferences and laboratory periods to be equivalent to the number of hours assigned to biochemistry and to receive equal semester hour credit Blood chemistry as well as urinalysis should be included in the laboratory schedule The lectures could be so formulated as to include those essential phases of biochemistry of particular value to the content of instruction This course to consist of 32 didactic and 96 laboratory hours would be an elective to be chosen by those pharmaceutical, medical and special students who had the necessary preparation in the basic chemical and biological sciences

The writer wishes to give an outline of the course as given at present with a sample examination based upon the lectures, recitations and laboratory work

1 The Definition and Classification of Urine Examinations

1 Physical 2 Chemical 3 Microscopic 4 Bacteriological 5 Clinical

2 The Normal Urine Picture

3 The Pathological Constituents of Urine

4 Glossary of Terms

5 Qualitative Examination of a Normal Urine for Indican, Creatinine, Dextrose, Urea, Uric Acid, Bile, Blood, Acetone, Diacetic Acid, Chloride, Sulphate, Phosphate

6 Qualitative Examination of a Pathological Urine for Glucose, Creatinine, Blood, Bile, Uric Acid, Indican, Acetone, Diacetic Acid

7 Eight Tests for Reducing Sugar, Differentiation of Glucose, Levulose, Lactose and Pentose

8 Eight Tests for Urinary Albumin

9 Quantitative Examination of Urine for Urea

- 1 By Hypobromite Method 2 By Urease Method

Ammonia

- 1 By Schiff Malfatti Method 2 By Aeration Method

Chlorides

- 1 By Mohr's Method 2 By Arnold Volhard's Method

10 Total Sulphates Total Solids Total Acidity (by Folin's Method) Etheral Sulphates

11 Qualitative and Quantitative Examination of a Sample of Pathological Urine for Blood Bile Acetone Sugar Albumin, Diacetic Acid, Total Acidity Indican, Chlorides, Urea, Uric Acid, Total Solids Total Nitrogen

12 Collection and Preservation of Specimens—Refrigeration, Toluene, Chloroform Thymol etc

13 Clarification and Decolorization of Specimens Talcum Pumice Stone, Magnesium Carbonate, Lead Acetate, Potassium Permanganate etc

- 14 The Form of Report 15 Questions and Problems

EXAMINATION IN URINALYSIS FOR PHARMACY STUDENTS

- 1 Outline the normal urine picture

- 2 What is the significance of a 24-hour urinary output of 4000 cc with a specific gravity of

- 1 035? 3 Calculate the total solids in the above sample

- 4 How would you definitely detect glucose in a sample of urine?

- 5 Briefly give three tests for urinary albumin

- 6 What is the composition of Esbach's Reagent? Benedict's Solution? Obermayer's Reagent? Fehling's Reagent?

- 7 How could you determine the amount of urea in urine?

- 8 Give a test for bile in the urine 9 How would you clarify a turbid urine?

- 10 Give the test for urinary indican and the chemistry involved

Those who sit for these lectures, who work in the laboratory on many samples, and who pass successfully the examinations given at the end of the course, are fit, we believe, to begin a more advanced excursion into the field of clinical chemistry

Although we may have been unduly negligent of our responsibilities, there comes to us a great comfort, even in our feeling of uncertainty as to the real value of our efforts in teaching a depised and rejected subject

Comes to us the poignant realization that on the front lines of the public health defensive, there are young men and women working quietly and efficiently in the hospital laboratories in the service of medicine as it ministers to the needs of an underhospitalized and underprivileged minority. These servants of the national health received some little training in urinalysis at our hands. Our task in teaching goes on

COMMENTS ON PAPER BY PROFESSOR ANTOINE E. GREENE ON
‘TEACHING URINALYSIS TO STUDENTS OF PHARMACY’

BY LOUIS GERSHENFELD *

It is difficult to offer a critical discussion of instruction of the kind you have just received from Professor Greene. To do justice to the subject would require more time than is at our disposal. It is, however, possible to offer certain suggestions and even to ask a question or two in the hope of all of us receiving more instruction

* Professor of Bacteriology and Hygiene and Director of the Bacteriological and Clinical Chemistry Laboratories at the Philadelphia College of Pharmacy & Science

I have been and am deeply interested in the subject which has been reviewed. The retail pharmacist to day falls into several classes. In a rural and suburban store, the pharmacist must have a knowledge of horticulture, agriculture, first aid, and he serves best if he is capable of assisting the medical practitioner at all times and this includes service as a laboratory technician. In small hospitals, pharmacists are frequently required to help as technicians in the laboratory. There are those students in pharmacy who after the first few years of study enjoy and therefore feel that they are especially qualified in laboratory work, and prefer to train themselves along these lines. Even in urban stores especially where professional pharmacy is practiced the clinical laboratory and especially the accurate performance of urinalyses can be of great service to pharmacy and the medical practitioner. In brief we must admit that this is an age of specialization and the pharmacy student who at the end of his career wants to be qualified for certain duties which fit in with the practice of pharmacy should be granted that privilege. Our courses in pharmacy must meet the demands of such branches of study as fit in with the practice of professional pharmacy, and elective courses in the curricula will help this situation very much. I am in full accord with the suggestion of Professor Greene that urinalyses be an acceptable elective and if possible a required subject of study and preferably fortified by other commonly performed clinical laboratory tests. This will fit in with the Applied Bacteriology and Public Health Studies which are required subjects as outlined in the Pharmaceutical Syllabus fourth edition. We find, of course, listed in the latter Biochemistry which is included as an optional subject and herein is to be found a consideration of excretions including urine. It is much more desirable to arrange for a thorough course in urinalyses and other clinical laboratory methods. At our own institution we are giving the latter as a required subject.

Professor Greene's comment is well taken that pharmacists should be prepared to dispense diagnostic reagents. These may be requested by the practitioner, who does his own laboratory work, and in some instances the latter may make inquiries for such preparations. It is not uncommon to find diabetics (especially those using insulin) testing their own samples of urine qualitatively for sugar having received this instruction from their own medical attendants. Such patients don't understand why pharmacists cannot supply Benedict's solution or other reagents. How many drug stores stock litmus paper frequently requested by customers? Many instances could be cited where contacts with medical practitioners were made due to the pharmacist's ability in supplying a diagnostic reagent.

Professor Greene states that "It is the purpose of the course to ground the student in the chemical examination of urine and to do that well." And he further states "Time does not permit any extensive consideration of microscopic or bacteriological urinalysis." Inasmuch as the title of this paper is "Teaching Urinalysis to Students of Pharmacy" it seems to me that it is important to direct attention to the fact that a careful microscopic study must be made a part of this instruction and as much emphasis should be made upon the value of the microscopic findings as upon the chemical findings. A bacteriological examination is conducted only occasionally but a microscopic examination is and must be at all times part of a routine urinalysis. Despite a most careful chemical examination with or without the finding of abnormal (chemical) constituents a correct interpretation of these chemical findings or the possibility of such urinalyses serving as an aid in diagnosis or prognosis may also necessitate microscopical laboratory aid. A careful microscopic examination should be part of every routine examination and in my own observation and experience, I have found that it is most desirable to give the chemical and microscopical instruction either at the same time or during the same semester. If possible the same instructor may handle both phases of this study, or if need be the microscopical and chemical departments may cooperate. Even in many of the medical schools, there is a lack of proper coordination in the instruction as it is presented when the chemical and microscopic examinations of urine are given to the undergraduates. There may even be too much emphasis given to the chemical examination or too little to the microscopic examination. Frequently the medical student is not in a position to learn the interpretation of the combined findings until he is assigned to the laboratory during his internship. In some measure this may account for the fact that entirely too many practitioners who do their own urinalyses merely do the chemical examination and do not carry out a microscopical examination, even though many of them have microscopes. Many examples could be cited to illustrate the above points. There may be albumin found in the sample. This may or may not be of marked significance depending upon the microscopical findings. It is a frequent

occurrence during the warm weather to find samples in transit and not properly preserved revealing an abundant quantity of bacteria most of which developed after the collection of the sample. During transit, it is possible for sufficient albumin to be extracted from the abundant growth of bacteria to give a positive chemical test for albumin. Also there are several chemical entities recognized microscopically by their characteristic type of crystals. Uric acid triple phosphates calcium oxalate, leucine, tyrosine and cystine are examples of some crystals which are revealed microscopically and are not detected chemically in urine as tests are not conducted for these in the routine chemical examination. We have fallen into the habit of speaking about the chemical test for blood but you all know that it is in reality a chemical test for hemoglobin, so that this chemical test does not reveal whether we are dealing with a hemoglobinuria (only hemoglobin in the urine) or a hematuria (whole blood in the urine). The latter denotes a pathological condition of the genito urinary tract, while a hemoglobinuria is in most instances the result of abnormalities outside of the genito urinary tract. Whole blood (as found in hematuria) will be revealed not only by a positive chemical test (for hemoglobin), but also by the finding of unruptured red corpuscles microscopically. Pus cells, casts, mucus and other organized cellular elements and evidences indicating disease of the urinary tract may be found upon microscopic examination, when a chemical examination may reveal no abnormalities. Let us remember that if there is some faulty arrangement in the instruction and in the lack of the coordination of the various phases of urinalyses as given to medical students the latter have the added advantage of additional training in a hospital during internship. The pharmacy student does not have and may not receive this added advantage and we who are responsible for seeing that such students are in a position to aid the medical practitioner must be assured that they will do so to the maximum degree.

I agree with Professor Greene that the worker must only report and not attempt to interpret laboratory findings. But at the same time he must be possessed of a rich fund of knowledge not so much to aid in interpreting the findings or to give information as to collection preservation etc., when such assistance and information are requested by the practitioner (who makes available other facts which are needed), but mainly because of the fact that the laboratory worker will be in a more favorable position to apply such better judgment in reading the findings revealed after the performance of the laboratory tests.

I think we all agree that it is a difficult task to include all data concerning urine in any course. At the same time an orderly arrangement of the whole subject should be maintained. Though many techniques should be given for the qualitative and even quantitative examination of various constituents the instructor should point out the relative value of the different procedures and the practical importance of the knowledge resulting therefrom. There are many techniques used in hospital laboratories or by Insurance Company examiners when testing samples of urine that are satisfactory for clinical purposes but which would not answer for research study. Yet these are the methods of choice in clinical laboratory practice and it is advisable to consider them. May I add a few additional notations to the outline of Professor Greene on the course as suggested by him the inclusion of which will be helpful.

1 A consideration of the frequency of urination and volume voided and factors influencing the latter

2 It is assumed, I believe that the physical examination is to include a consideration of transparency and sediments, odor, coloration and pigments, reaction, specific gravity, and the methods employed to report these findings

3 Mention is made of tests for urinary albumin. This I assume is to include also a consideration of Bence-Jones protein and proteoses, nucleoprotein etc.

4 Tests for Bile are to include methods for Bile Pigments and Bile Acid Salts

5 Mention should be made of the Diazo Substance and the Diazo Reaction, a test still requested by some

6 Detection of Inorganic Metallic Poisons in Urine as arsenic lead, mercury, etc., should be included as this is becoming of greater significance in pathological conditions

7 A consideration of tests for kidney function should be given especially mentioning the technique of the Phthalein or Vital Red Test as frequently the samples of urine are sent to the laboratory worker who is requested to determine the quantity of phenolsulphonephthalein eliminated

I have been and am deeply interested in the subject which has been reviewed. The retail pharmacist to day falls into several classes. In a rural and suburban store, the pharmacist must have a knowledge of horticulture, agriculture, first aid, and he serves best if he is capable of assisting the medical practitioner at all times and this includes service as a laboratory technician. In small hospitals, pharmacists are frequently required to help as technicians in the laboratory. There are those students in pharmacy who after the first few years of study enjoy and therefore feel that they are especially qualified in laboratory work, and prefer to train themselves along these lines. Even in urban stores, especially where professional pharmacy is practiced, the clinical laboratory and especially the accurate performance of urinalyses can be of great service to pharmacy and the medical practitioner. In brief, we must admit that this is an age of specialization and the pharmacy student who at the end of his career wants to be qualified for certain duties which fit in with the practice of pharmacy should be granted that privilege. Our courses in pharmacy must meet the demands of such branches of study as fit in with the practice of professional pharmacy, and elective courses in the curricula will help this situation very much. I am in full accord with the suggestion of Professor Greene that urinalyses be an acceptable elective and if possible a required subject of study, and preferably fortified by other commonly performed clinical laboratory tests. This will fit in with the Applied Bacteriology and Public Health Studies which are required subjects as outlined in the Pharmaceutical Syllabus fourth edition. We find, of course, listed in the latter Bio chemistry, which is included as an optional subject and herein is to be found a consideration of excretions including urine. It is much more desirable to arrange for a thorough course in urinalysis and other clinical laboratory methods. At our own institution we are giving the latter as a required subject.

Professor Greene's comment is well taken that pharmacists should be prepared to dispense diagnostic reagents. These may be requested by the practitioner, who does his own laboratory work, and in some instances the laity may make inquiries for such preparations. It is not uncommon to find diabetics (especially those using insulin) testing their own samples of urine qualitatively for sugar having received this instruction from their own medical attendants. Such patients don't understand why pharmacists cannot supply Benedict's solution or other reagents. How many drug stores stock litmus paper frequently requested by customers? Many instances could be cited where contacts with medical practitioners were made due to the pharmacist's ability in supplying a diagnostic reagent.

Professor Greene states that "It is the purpose of the course to ground the student in the chemical examination of urine and to do that well." And he further states "Time does not permit any extensive consideration of microscopic or bacteriological urinalysis." Inasmuch as the title of this paper is "Teaching Urinalysis to Students of Pharmacy" it seems to me that it is important to direct attention to the fact that a careful microscopic study must be made a part of this instruction and as much emphasis should be made upon the value of the microscopic findings as upon the chemical findings. A bacteriological examination is conducted only occasionally but a microscopic examination is and must be at all times part of a routine urinalysis. Despite a most careful chemical examination with or without the finding of abnormal (chemical) constituents a correct interpretation of these chemical findings or the possibility of such urinalyses serving as an aid in diagnosis or prognosis may also necessitate microscopical laboratory aid. A careful microscopic examination should be part of every routine examination and in my own observation and experience, I have found that it is most desirable to give the chemical and microscopical instruction either at the same time or during the same semester. If possible, the same instructor may handle both phases of this study, or if need be the microscopical and chemical departments may co-operate. Even in many of the medical schools, there is a lack of proper coördination in the instruction as it is presented when the chemical and microscopic examinations of urine are given to the undergraduates. There may even be too much emphasis given to the chemical examination or too little to the microscopic examination. Frequently the medical student is not in a position to learn the interpretation of the combined findings until he is assigned to the laboratory during his internship. In some measure this may account for the fact that entirely too many practitioners who do their own urinalyses merely do the chemical examination and do not carry out a microscopical examination, even though many of them have microscopes. Many examples could be cited to illustrate the above points. There may be albumin found in the sample. This may or may not be of marked significance depending upon the microscopical findings. It is a frequent

occurrence during the warm weather to find samples in transit and not properly preserved revealing an abundant quantity of bacteria most of which developed after the collection of the sample. During transit, it is possible for sufficient albumin to be extracted from the abundant growth of bacteria to give a positive chemical test for albumin. Also there are several chemical entities recognized microscopically by their characteristic type of crystals. Uric acid, triple phosphates, calcium oxalate, leucine, tyrosine and cystine are examples of some crystals which are revealed microscopically and are not detected chemically in urine as tests are not conducted for these in the routine chemical examination. We have fallen into the habit of speaking about the chemical test for blood, but you all know that it is in reality a chemical test for hemoglobin, so that this chemical test does not reveal whether we are dealing with a hemoglobinuria (only hemoglobin in the urine) or a hematuria (whole blood in the urine). The latter denotes a pathological condition of the genito urinary tract, while a hemoglobinuria is in most instances the result of abnormalities outside of the genito urinary tract. Whole blood (as found in hematuria) will be revealed not only by a positive chemical test (for hemoglobin), but also by the finding of unruptured red corpuscles microscopically. Pus cells, casts, mucus and other organized cellular elements and evidences indicating disease of the urinary tract may be found upon microscopic examination when a chemical examination may reveal no abnormalities. Let us remember that if there is some faulty arrangement in the instruction and in the lack of the coördination of the various phases of urinalyses as given to medical students, the latter have the added advantage of additional training in a hospital during internship. The pharmacy student does not have and may not receive this added advantage and we who are responsible for seeing that such students are in a position to aid the medical practitioner must be assured that they will do so to the maximum degree.

I agree with Professor Greene that the worker must only report and not attempt to interpret laboratory findings. But at the same time he must be possessed of a rich fund of knowledge not so much to aid in interpreting the findings or to give information as to collection, preservation, etc. when such assistance and information are requested by the practitioner (who makes available other facts which are needed) but mainly because of the fact that the laboratory worker will be in a more favorable position to apply such better judgment in reading the findings revealed after the performance of the laboratory tests.

I think we all agree that it is a difficult task to include all data concerning urine in any course. At the same time an orderly arrangement of the whole subject should be maintained. Though many techniques should be given for the qualitative and even quantitative examination of various constituents, the instructor should point out the relative value of the different procedures and the practical importance of the knowledge resulting therefrom. There are many techniques used in hospital laboratories or by Insurance Company examiners when testing samples of urine that are satisfactory for clinical purposes but which would not answer for research study. Yet these are the methods of choice in clinical laboratory practice and it is advisable to consider them. May I add a few additional notations to the outline of Professor Greene on the course as suggested by him, the inclusion of which will be helpful.

- 1 A consideration of the frequency of urination and volume voided and factors influencing the latter

- 2 It is assumed, I believe that the physical examination is to include a consideration of transparency and sediments, odor, coloration and pigments, reaction, specific gravity, and the methods employed to report these findings

- 3 Mention is made of tests for urinary albumin. This I assume is to include also a consideration of Bence-Jones protein and proteoses, nucleoprotein, etc.

- 4 Tests for Bile are to include methods for Bile Pigments and Bile Acid Salts

- 5 Mention should be made of the Diazo Substance and the Diazo Reaction, a test still requested by some

- 6 Detection of Inorganic Metallic Poisons in Urine as arsenic, lead, mercury, etc., should be included as this is becoming of greater significance in pathological conditions

- 7 A consideration of tests for kidney function should be given, especially mentioning the technique of the Phthalein or Vital Red Test as frequently the samples of urine are sent to the laboratory worker who is requested to determine the quantity of phenolsulphonephthalein eliminated

PROCEEDINGS OF THE LOCAL BRANCHES

"All papers presented to the Association and Branches shall become the property of the Association with the understanding that they are not to be published in any other publication prior to their publication in those of the Association, except with the consent of the Council" —Part of Chapter VI, Article VI of the By-Laws

ARTICLE III of Chapter VII reads "The objects and aims of local branches of this Association shall be the same as set forth in ARTICLE I of the Constitution of this body, and the acts of local branches shall in no way commit or bind this Association, and can only serve as recommendations to it And no local branch shall enact any article of Constitution or By-Law to conflict with the Constitution or By-Laws of this Association"

ARTICLE IV of Chapter VII reads "Each local branch having not less than 50 dues paid members of the Association, holding not less than six meetings annually with an attendance of not less than 9 members at each meeting, and the proceedings of which shall have been submitted to the JOURNAL for publication, may elect one representative to the House of Delegates"

Reports of the meeting of the Local Branches shall be mailed to the Editor on the day following the meeting, if possible Minutes should be typewritten with wide spaces between the lines Care should be taken to give proper names correctly and manuscript should be signed by the reporter

BALTIMORE

The April meeting of the Baltimore Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held at the Hotel Emerson on Monday, April 29th President Reindollar presiding

The meeting was preceded by an informal dinner in honor of the guest speaker, Dr Walter H Hartung, ten members and their guests were present at the dinner

The minutes of the March meeting were read by the secretary and approved President Reindollar then introduced the speaker of the evening Dr Walter H Hartung director of Research, Sharp & Dohme of Philadelphia

Dr Hartung selected for his topic, Iatrochemistry and Pharmacy in 1935 " He stated that in 1935 the old term iatrochemist should be revised to include chemists who are studying the influence of chemical structure upon physiological activity In a study made several years ago it was pointed out while the U S P V had only three synthetic drugs the present Pharmacopœia recognizes 130 such compounds Dr Hartung pointed out also that many of our most valuable drugs used as antiseptics and anesthetics are pure synthetic compounds

After an historical review of his topic Dr Hartung described in detail the interesting work that is going forward in his laboratory on studies of derivatives of propiophenone During the course of his lecture the speaker elaborated on his discussions by explaining the reactions involved and the structural relationships of the various compounds He described the first pressor anesthetic as developed in his laboratory and showed the interesting fact that the meta OH group in epinephrine is more important than the para OH group

Dr Hartung concluded his talk by discussing the iatrochemistry of mescaline and pointing out recent developments in the study of the sex hormones Finally a plea was made for a better understanding between the pharmacologist the chemist and the physician in the clinic

At the conclusion of the address a general discussion was entered into by the members present President Reindollar extended the thanks of the organization and called for a rising vote of thanks About twenty-five attended the meeting The meetings of the Branch were called off until Fall
C JELLEFF CARR Secretary Treasurer

NEW YORK

The April meeting of the New York Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held on April 8 1935, in the New York College of Pharmacy, Columbia University About eighty five members and their guests attended

After the meeting had been called to order by President Charles W Ballard, the secretary was called upon for his report which was read and accepted The treasurer, Mr Turner F Currens, reported a balance on hand

Chairman Lehman of the Committee on Education and Legislation, then reported as follows

Federal Legislation—N I R A Senator Pat Harrison's Bill S 2445 on Code Legislation, gives the following powers to the President of the U S in tentative draft of Revised N I R A

- 1 To establish rules of fair competition
- 2 To promote or maintain cooperative organization and action of trade and industrial groups
- 3 To induce or maintain cooperative relations between, or cooperative activities of, labor and management
- 4 Promote or maintain fair competition
- 5 Prevent or eliminate competitive practices which are unfair or destructive of fair competition or restraints upon trade which tend to diminish the amount thereof contrary to the public interest
- 6 Promote the fullest effective utilization of the productive and distributive capacity of trade and industry
- 7 To prevent or eliminate restrictions upon production except those hereinafter expressly sanctioned
- 8 Promote or maintain increased purchasing power and increased consumption of industrial and agricultural products
- 9 Reduce or relieve unemployment or regularize employment
- 10 To establish proper minimum wages and maximum hours of labor
- 11 Improve the standards and conditions of labor
- 12 Promote the rehabilitation of industry
- 13 Conserve natural resources and prevent production or competition wasteful of such resources, and injurious to commerce therein
- 14 To remove unreasonable burden upon or protect the reasonable flow of interstate or foreign commerce

The bill in question refers however to interstate and foreign commerce

It is claimed that the amended law is a tactical admission that most of the Fair Trade provisions in the present Code are unconstitutional (Mr Richberg is given credit for having written this bill)

There are several Anti-Price Discrimination bills before Congress—Mapes Bill, H R 5062, Wheeler Bill S 944 Bankhead Bill S 2211, Huddleston Bill, H R 6618 White Bill, H R 6246

These bills would make it unlawful to discriminate in price of any commodity, regardless of quantity purchased at wholesale

The King Bill S 1923 would legalize reasonable written trade agreements for the regulation of competition similar to the Capper-Kelly Bills

All of these have the support of retail trade organizations, and are an evidence that our lawmakers are beginning to realize that something must be done to save the small distributor

The Black 30 hour bill would limit the working hours in commercial and manufacturing establishments to 30 hours weekly, the bill has been reported out of committee favorably and is on the calendar It is on the Senate calendar for action It is opposed by commercial and industrial bodies

There is a possibility of the Copeland Pure Food, Drugs and Cosmetics Bill S 5 coming up for action soon There are still many objections to the same from various sources which will make enactment difficult

I have here a protest issued by the National Committee of Manufacturers of Cosmetics, objecting to certain regulations as to the labeling of antiseptics

So far, five states besides California have enacted the Fair Trade Law (Junior Capper-Kelly Bill), namely, New Jersey, Washington, Oregon, Maryland and Arizona The Committee on Legislation of the N Y State Pharmaceutical Association is making strenuous efforts to have our bill passed this session of the Legislature the bill is to come up for vote to day April 8th Send telegrams to Senator Dunnigan and to the Assemblyman and Senator of your own district, favoring the passage of the bill

State Legislation — The Assembly has passed the Prophylactic Bill (Stewart int 489) and sent the same to the Senate for action on April 3rd

Delay in legislative action has been due to the rivalry of two Democratic factions in the Metropolitan district in the question of reapportionment also there has been powerful opposition to the Fair Trade bill from department store and price cutter organizations

The N Y Pharmaceutical Council has protested against the raids being made by the Federal Alcohol Tax Unit on drug stores in which it is alleged that untaxed alcohol was found, telegrams were sent to John T Flynn, supervisor of the Alcohol Tax Unit, Secretary of the Treasury, Morgenthau, and Rowland Jones, Washington Representative of the N A R D

Chairman Cosmo Ligorio, of the Membership Committee submitted the association membership application of Mr Stummer for forwarding to Secretary Kelly

Fred Schaefer reported that the question of branch affiliation had been considered thoroughly and that there was no provision which would prevent the Branch from affiliating with the State Association or with the newly organized Council He, therefore, moved that the Branch become affiliated with the State Association and that it should appoint two permanent delegates to the New York Pharmaceutical Council, and appropriate \$10 00 for each delegate, the sum of \$20 00 to be paid to the New York Pharmaceutical Council The secretary asked Mr Schaefer if affiliation would obligate the Branch to have one half of its membership, members of the State Association In answer to this, Mr Schaefer stated that the State Association did have such a requirement for pharmaceutical organizations affiliated with it, but that it would forego this provision and follow a new procedure, of one delegate for the first twenty five state association members and one for each fifty additional state association members during the period 1935 In 1936 the requirement would be one delegate for every twenty five state association members Since there was no further discussion a vote was called and the motion was approved

Dr Hugo Schaefer then submitted the framed life membership certificate given to Dr Fischelis at the time of his recent testimonial dinner This was received by the Branch for forwarding to Dr Fischelis

President Ballard announced that Dr Fischelis president of the AMERICAN PHARMACEUTICAL ASSOCIATION, would address the Branch at its meeting in May and would elaborate on his ideas for consolidating pharmaceutical organizations

A letter announcing the testimonial dinner to be tendered Dr Ernest Little on May 20th, was read by the secretary In commenting upon this, Dr Ballard urged the members of the New York Branch to cooperate Dr Hugo Schaefer suggested that a brief announcement of this dinner be included in the New York Branch meeting notice for the May meeting and also proposed that the New York Branch should try to at least make up one table, if not more He also urged close cooperation with the Northern New Jersey Branch

The application for Branch membership of Prof Peter Conroy was received and favorably voted upon

Secretary Hugo Schaefer, of the Remington Medal Committee, then announced that the Remington Medal for 1935 had been awarded to Samuel Hilton, well known retail pharmacist and association worker, of Washington, D C The secretary was directed to write him a letter of congratulations

No specific plans for the presentation of the medal were discussed and it was suggested that the matter be taken up by the Executive Committee of the Branch

Chairman Leonard Steiger, of the Committee on Progress of Pharmacy, was then called upon for his report which follows

The *Chemist and Druggist* (London 3/23/35) reports on the discovery of a new Ergot alkaloid by Dudley and Moir of the National Institute for Medical Research It has been named 'Ergometrine' and it is found in the B P liquid extract of Ergot In the author's opinion the isolation of Ergometrine indicates that the substance for which ergot was actually introduced into medicine, has been obtained For oral administration ergometrine is described as the essential constituent of ergot extracts

(*Ind Eng Chem, News Ed*, Vol 13, No 7 4/10, 1935) The first Eli Lilly award in Biochemistry goes to Wm N Allen of the School of Medicine and Dentistry of the University of Rochester The basis of the award is the outstanding work done by Dr Allen in developing a sharply defined biological test for the action of *Corpus Luteum*, the use of this test to isolate a po

tent extract, and the complete purification of the hormone, "progesterin" The present knowledge of the solubilities and physical characteristics of progesterin is due to the work of Dr Allen, who, with R K Meyer, achieved the first separation of "progesterin" from oestrin

Thomas N Fraser in *British Medical Journal* (1934) reports on a fatal case of subacute yellow atrophy of the liver after use of cinchophen On account of its toxicity the advisability of abandonment of the administration of cinchophen is considered

Very successful treatment of severe mushroom poisoning with large doses of coramine (*Med Klin*, 1934, rep by C A, Vol 29, 1505) Cases of mushroom poisoning in which among other symptoms loss of consciousness, cyanosis and severe respiratory depression have occurred, have responded remarkably to treatment with large doses of coramine It has been used very successfully also in cases of respiratory depression and failure, during anesthesia poisoning with narcotics and so forth

Following Mr Steiger's report, Dr Ballard introduced the speaker of the evening, Dr Arno Viehoveer, professor at the Philadelphia College of Pharmacy and Science who spoke on "Evaluation of Cathartic Drugs"

Dr Viehoveer's address centered about the use of a new test animal for biological standardizations This small test animal, *Daphnia*, possesses numerous advantages which make its use as a biological test animal particularly advantageous

The extremely interesting and instructive moving pictures showing the effects of strychnine on the test animal proved ample evidence of the one great advantage, namely the transparency of the animal

The lecture included numerous demonstrations and lantern slides which added very considerably to the interest of Dr Viehoveer's address

The adaptability of the test animal for standardizing drugs of the anthraquinone series such as senna frangula rhubarb, cascara and aloe was very well shown in the moving picture films which Dr Viehoveer presented

Dr Viehoveer answered questions relative to the subject He was given a rising vote of thanks

RUDOLF OTTO HAUCK, *Secretary*

NORTHERN OHIO

The April meeting of the Northern Ohio Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held on the evening of April 12, 1935 at the Faculty Club of Western Reserve University, Cleveland About forty members and their friends attended

President Speer called the meeting to order and the report of the secretary was read and approved

Dr Lawrence P Hall of the research staff of the Mallinckrodt Chemical Works, St Louis, was then introduced By means of lantern slides and considerable demonstrating material and interesting specimens Dr Hall treated the Branch to a very much worth while discussion of the uses of bismuth and its compounds Some of the high lights of the discussion follow

Because bismuth is in daily use, we are apt to forget that it is not a common element but actually one of the rarer elements It is present in the earth's crust to the extent of about one part in ten million

The bismuth consumed in the world amounts to around 400 tons per year and is obtained from Peru, other South American countries, United States Canada China Australia, etc The domestic supplies are obtained primarily as a by-product from lead refining The metal produced in this way is of high purity

When combined with pure chemicals by properly controlled processes this metal permits the production of pure compounds The most common ones are the subcarbonate subnitrate, subsalicylate and subgallate, although various other salts are used such as the oxychloride, betanaphtholate, subiodide, various organic derivatives such as tartrates etc

Bismuth and its compounds have certain peculiar properties which make it desirable for use in industry, in the laboratory, in cosmetics in dentistry, in radiology, and most important of all in pharmacy Industrially, bismuth itself, is widely used in low melting alloys which find application in safety devices such as sprinkler heads links for fire doors, plugs for gas cylinders and boilers in machine shops for bending thin wall tubing sealing glass to metal, setting and aligning

dies, molding, soldering, etc., in toys, such as trick spoons and casting outfits for children, and in other surprising and constantly increasing uses. Bismuth compounds are used in producing lustrous finishes and glazes on dishes, vases and artificial pearls, in glazes for gold, in dense, refractive optical glass, in luminous paints. Probably high cost prevents more extended use.

The cosmetic use dates from the seventeenth century when Lemery made a fortune from the sale of "Magisterium of Bismuth" for face powder. Bismuth salts have excellent covering power and adhesion but are sensitive to discoloration by hydrogen sulphide and are drying to the skin.

In radiology the introduction of bismuth salts for visualization of the gastro intestinal tract provided the principle for examination of hollow organs of the body. Bismuth compounds have also been used for outlining the bladder, abscesses, fistulas and sinuses.

In medicine, bismuth salts are used topically and systemically. Externally they may be applied as ointment, paste or powder to form a slightly astringent, dry scab which gives mechanical protection and allows rapid healing. Internally they form soothing protective coatings effective in certain gastro intestinal ailments. Systematically various types of bismuth compounds are used hypodermically for syphilis, frambæsia and Vincent's angina.

In these various uses the properties of prime importance to the pharmacist include purity, kind of crystal form, color, light stability, fineness and chemical stability. By way of illustration some lots of the subcarbonate will turn yellow in light, sometimes improperly prepared subnitrate develops excessive acidity and an odor, coarse material will not give usable suspensions. Bismuth salts which are bulky, finely crystalline, pure and stable should give the optimum benefit in pharmaceutical uses.

N T CHAMBERLIN *Secretary*

STUDENT BRANCH ST JOHN'S UNIVERSITY

The regular monthly meeting of the St. John's University Student Branch, of the AMERICAN PHARMACEUTICAL ASSOCIATION was held on March 18th. Preceding the meeting a dinner was held at the Lido Restaurant for the members of the Branch, their friends and guests. The meeting was called to order by President Arancio in the College at 8:30 P. M. The reading of the minutes was suspended in deference to the speakers of the evening.

In announcing the subject for the evening's discussion, "What the Physician and the Professional Pharmacist Expects of the Coming Generation of Pharmacists," President Arancio pointed out that many people see a well-defined trend toward professional pharmacy, away from the ultra commercial type of pharmacy.

It was with the idea of stimulating discussion among the members of the Branch on this important topic that the program of the meeting was arranged. Bringing to the future pharmacist the viewpoint of the Physician and the Professional Pharmacist in an open forum of this kind should lead to clearer thinking on many of the problems now facing pharmacy, in this shift to a newer type of professional pharmacy of the future," said President Arancio.

Chairman William Matz, of the Committee on Program, after a few introductory remarks presented the first speaker of the evening, Dr. Thomas B. Wood, well-known Brooklyn physician.

Doctor Wood discussed recent advances in the field of medicine and pharmacy, particularly in the field of Endocrine Therapy. In order to meet the needs of the physician manufacturers had taken it upon themselves to prepare and standardize either chemically or biologically, endocrine preparations in the form of ampuls for intravenous or subcutaneous use. He asked the question "Can a physician depend upon the modern graduate in pharmacy to prepare an ampul containing a sterile solution of glucose in an intravenous emergency?" It is for this reason that manufacturers have availed themselves of the opportunity to prepare such preparations. Doctor Wood expressed the opinion that pharmacists should be prepared to meet the needs of the physician along these lines. He could do this not only by carrying a full line of preparations for parenteral medication but by being ready in case of an emergency to prepare ampuls.

After discussing the evils of substitution and of giving information to the patient regarding the contents or the use of a prescription, Dr. Wood, concluded by stating that the physician expects of the pharmacist of the future: "1. A duly qualified gentleman whose honesty and integrity can be depended upon. 2. To be qualified to prepare special formula tablets and ampuls for intravenous injection, etc. 3. To display the utmost tact in dealing with the patient of the physician. On the other hand the pharmacist should expect of the physician: 1. To adhere, by

and largely to U S P and N F preparations in prescribing 2 To write prescriptions clearly 3 To expect courtesy from the physician when he phones in regard to an incompatible mixture, overdose, etc "

Dr Wood expressed the hope that the future will bring a better understanding between physicians and pharmacists in regard to their mutual problems 'Nothing is more noble,' said Dr Wood "than in aiding in the relief of the sufferer '

Dr Otto Raubenheimer, well and favorably known Brooklyn Pharmacist was then introduced and spoke on the subject of What the Professional Pharmacist Expects of the Coming Generation of Pharmacists "

It is necessary to love your profession,' said Dr Raubenheimer, in pointing out that the practice of pharmacy affords all of the experiences, contacts and conditions necessary for the good life

In commenting on some of the points covered by the previous speaker, he pointed out the difficulties experienced by local pharmaceutical associations in getting physicians to prescribe U S P and N F preparations The speaker then related many personal experiences he had in dealing with physicians and stressed the necessity for tact as well as professional dignity in dealing with physicians In connection with the operation of a professional pharmacy, he stressed the essential need for a library adequate to serve the needs of modern dispensing pharmacy

'The relation between the physician and the pharmacist should be a cordial one and can be made so if each would obligate himself to the ethics of his profession " said Dr Raubenheimer in conclusion

After the speakers had answered several questions by the members, a rising vote of thanks was extended the speakers

ADA J BIZZARI, *Secretary*

A remarkable gathering of various pharmaceutical interests has always marked the annual A P H A Week, because of the unity and understanding of its membership The coordination of these elements has made for the success of the annual conventions The meetings in the different sections of the country have enabled the pharmacists to cooperate for the advancement of American pharmacy



Prescription Department of L S Williams Pharmacy Baltimore

ASSOCIATION BUSINESS

AD INTERIM BUSINESS OF THE COUNCIL AMERICAN PHARMACEUTICAL ASSOCIATION, 1934-1935

Office of the Secretary, 2215 Constitution Avenue, Washington, D C

LETTER NO 14

March 20, 1935

To the Members of the Council

72 *Committee on the Proposed Council on Pharmaceutical Practice* Motion No 24 (Council Letter No 12, page 166) has been carried and Chairman Cook has been advised

73 *Use of the Text of the N F V* Motion No 25 (Council Letter No 12, page 166) has been carried, and Mr Druer has been advised

74 *Year Books for the Library of Congress* No comments have been received on Motion No 26 (Council Letter No 12 page 166) and a vote is called for at this time

75 *Bequest by Dr Frederick B Kilmer* President Fischelis has forwarded a copy of the following letter addressed to him by Miss Josephine I Dooley, Secretary to Dr Kilmer and an executor of his will

Clause 6 of Dr Frederick B Kilmer's will recites as follows

' 6 I give and bequeath unto the AMERICAN PHARMACEUTICAL ASSOCIATION organized under the District of Columbia, the sum of Three Thousand Dollars, to be held in trust the income to be applied to the awarding of a prize for meritorious work in pharmacognosy, such prize to be known as 'The Kilmer Prize ' or an equivalent designation In awarding the prize preference to be given to studies in vegetable drugs The recipient of the prize shall be a graduate in pharmacy Teachers in colleges of pharmacy workers in pharmaceutical laboratories, are to be excluded from competing for the prize Prize to be awarded under such conditions as the ASSOCIATION may elect Funds arising from the income which may not be used are to be added to the amount of the prize or added to the principal as the ASSOCIATION may elect "

I give you the above information because it is naturally of interest to your ASSOCIATION Doctor Kilmer, as you undoubtedly know, died December 28, 1934

Under the By-Laws of the Council this communication is referred to the Committee on Property and Funds for recommendation by direction of the chairman of the Council

76 *Report of the Auditor* The following has been submitted

February 11, 1935

Mr C W Holten Treasurer,
AMERICAN PHARMACEUTICAL ASSOCIATION
Washington, D C

Dear Sir

I have made an examination of the books and accounts of the AMERICAN PHARMACEUTICAL ASSOCIATION and your report, as Treasurer, for the calendar year 1934, and beg to report as follows

All receipts have been traced to deposits in banks to the credit of the respective funds for which received, and all disbursements have been found evidence by properly authorized voucher checks

I have verified the cash balance belonging to the various funds, totaling \$28,721 36 and found same to be correct

Investments aggregating a par value of \$139 400 00 have been verified by an examination of the bonds representing these securities All coupons which have not matured as of December 31, 1934 have been found attached to the bonds

The income account of each of the permanent funds, except the Research Fund, and both of the trust funds have been examined and found to be correct. The income account of the Research Fund fails to include six month's bond interest on \$6000 00 U S Liberty Bonds amounting to \$127 50. The coupons representing this interest were deposited on February 7, 1935.

During the year 1934 a total capital expenditure of \$78,590 61 was made on account of the construction costs of the Headquarters Building in Washington increasing the cost of this property to \$535,796 07.

Records maintained by the secretary of the ASSOCIATION have been examined and transfers of funds from his account to the account of the Treasurer have been verified.

Respectfully submitted
(Signed) W A JOHNSON,
Certified Public Accountant

The treasurer's report for 1934 will be printed in a later issue of the JOURNAL as a part of the ASSOCIATION'S records formerly included in the YEAR BOOK.

77 *Sale and Exchange of Liberty Bonds* Under the Second Call, October 15, 1934, and the Third Call, March 15, 1935, the following Fourth Liberty Loan 4 1/4% Bonds, 1933-1938, in the funds named, have been called for payment.

Second Call	October 15, 1934
Endowment, B 01905922 C	\$ 100 00
Centennial, H 04951118 C	100 00
Ebert Prize, 163208 R	1000 00
Research, 30752 R and B 00925702 C	6000 00
Third Call	March 15, 1935
Endowment, 6605 R	\$5000 00
321206 R	500 00
E 00769335 C	1000 00
Centennial, 321207 R	500 00
Ebert Legacy, 364536 R	1000 00
Life Membership, 338207 R	1000 00
364525 R	1000 00
Research, 321205 R	500 00
151885 R	1000 00
Procter 163207 R	1000 00
365087 R	1000 00
F 01886616 C	100 00

The following letter has been received from Chairman Philip of the Committee on Finance
Dr Charles H LaWall, under date of March 18th, has written me as follows

'I agree that the capital relieved by the calling in of U S Fourth Liberty Loan Bonds owned by the A PH A be reinvested in the U S Treasury Bonds of 1955-1960, bearing 2 7/8% interest

Therefore, two of the three members of the Finance Committee approving this exchange of bonds, I ask that you take such steps as are necessary to sell the present bonds and buy the new ones

If a motion to the Council is necessary for this step, I so move

This communication answers your letter of March 19th, with enclosure from Henry Morgenthau, Jr, Secretary of the Treasury

There has been called to my attention, the Home Loan Bonds, that pay a better rate of interest. These bonds are, as those favoring the purchase of them express it, 'a moral obligation of our Government'

It is my opinion that the higher rate of interest, while desirable, should not defer us from considering the greater safety of the bond the Committee suggests purchasing. Security of principle during these trying times for money entrusted to our care is the first and most important consideration."

It will be necessary to transfer two thousand dollars of the accumulated interest in the Life Membership Fund invested in the above bonds, to the Current Fund

(Motion No 28) *It is moved by Philip, as Chairman of the Committee on Finance that the called Fourth Liberty Loan Bonds listed above be sold and that the proceeds be invested in U S Treasury Bonds 2 7/8%, 1955-1960, or that the bonds be exchanged on an even basis, and that since most of the called bonds are registered, and as this form is required the following be re adopted (see JOURNAL, A PH A, Dec 1933 pages 1302-1303)*

Resolved, that C W Holton, treasurer, and E F Kelly secretary, are here by authorized to buy, sell deal in, assign or negotiate the called Fourth Liberty Loan Bonds which are owned by, or registered in the name of, the AMERICAN PHARMACEUTICAL ASSOCIATION and to that end, to endorse transfer and deliver the same

By direction of the Chairman of the Council a vote on this matter is called for at this time, as the exchange cannot be made after March 27 1935 E F KELLY, Secretary

NORTHERN NEW JERSEY BRANCH, A PH A

The Northern New Jersey Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION held its second annual Physicians Night as its April meeting, on April 15th. Due to the development during the year of the New Jersey Formulary the greater part of the evening was devoted to a discussion of this important project. William Richert of Elizabeth addressed the physicians and pharmacists on the work from the viewpoint of the pharmacist and Dr H B Wilson of Hackensack, discussed the physician's views.

Dr Hans Molitor, director of the Merck Institute of Therapeutic Research addressed the meeting on the subject, "Therapeutic Research and Its Relation to Pharmacy, Medicine and Chemistry" in which he explained the objects of research in developing new drugs, justifying the use of old drugs, and in developing new uses for old drugs.

SECTION ON PRACTICAL PHARMACY AND DISPENSING

Due to the fact that the convention date of the ASSOCIATION is in the early part of August instead of the latter part, it will be necessary for those interested in presenting papers to this Section to submit the title and a short abstract, to the secretary several weeks earlier than the usual time. Every one interested in the work of this Section is invited to take part and asked to forward all titles and abstracts to the secretary as promptly as possible.—HENRY M BURLAGE *Chairman* L W RICHARDS *Secretary*, School of Pharmacy University of Montana Missoula, Montana

While the foregoing has been inserted by the

officers of the Section on Practical Pharmacy and Dispensing, it applies to all Sections and Conferences. For officers—see the roster in this issue of the JOURNAL.

PHARMACEUTICAL SERVICE IN THE ARMY

Representatives of the AMERICAN PHARMACEUTICAL ASSOCIATION, The American Association of Colleges of Pharmacy and the National Association Boards of Pharmacy met in Washington on April 5th and 6th to continue the joint efforts to improve the pharmaceutical service for the Army and to secure better recognition for pharmacists by improving their status.

Plans to broaden the work of army pharmacists were considered. Visits at the invitation of the Surgeon General were made to the hospitals at the Medical Center and at Fort Myer. The pharmacies at those hospitals and the work carried on in them were carefully inspected. A conference with Surgeon General Patterson and Colonel McDonald was held during which proposed legislation looking to a commissioned rank for army pharmacists was discussed.

It is expected that a similar joint committee meeting will be held in Washington during June or July and that an encouraging report of progress can be made at the Portland Oregon meeting, August 5th-10th. The efforts to secure a satisfactory status for pharmacy in the Army and the Navy have been interrupted by the reductions affecting these services during the depression. This work is being taken up aggressively again and when a satisfactory program is worked out the national, state and local associations will be informed and their coöperation requested.

EDITORIAL NOTES

KENTUCKY FARM FOR NARCOTIC ADDICTS

The \$4,000,000 00 narcotic farm established by the Federal Government in the heart of Kentucky's blue grass country for the segregation and rehabilitation of narcotic addicts will be dedicated May 25th, by Surgeon General Hugh S. Cumming.

Construction of the huge plant, which covers eleven acres in the centre of a 1000 acre farm tract acquired by the government, began in the Spring of 1932. A similar institution is being erected at Fort Worth, Texas.

Efforts will be made to restore to health and train to be self supporting and self-reliant those who are admitted. Experiments will be carried on to determine the best methods of treatment.

The farm staff will number several hundred with an annual payroll of slightly less than \$500,000 00. Additional operating costs will bring the yearly cost to about \$750,000 00.

A REPORTED POISONING CASE

A case of poisoning in Brooklyn reported in the press is now before the Grand Jury, hence names are not mentioned. References to a married man whose wife and three children died between the last of March and middle of April. The Police Department in Brooklyn struck by the coincidence, had post-mortem examinations made and thallium was found in the viscera. Chemical analysis by spectroscopy revealed the presence of thallium, not only in the viscera but in some cocoa. However, ordinary chemical analysis failed to detect thallium.

Mention is made because of the article in this issue by James C. Munch.

CHIEF OF THE BUREAU OF MEDICINE AND SURGERY

By an act of Congress March 3, 1871, it was provided that the chiefs of the bureaus of medicine and surgery, provisions and clothing, steam engineering and construction and repair shall have the relative rank of commodore, while holding said position and shall have respectively the title of surgeon general, paymaster general, engineer in chief and chief constructor. The first to bear this new title of Surgeon General though the fifth to hold office as Chief of the Bureau of Medicine and Surgery, was William Maxwell Wood of Maryland.

PHARMACEUTICAL MUSEUM FOR MOSCOW

The *Pharmaceutical Journal* of April 27, 1935 states that a pharmaceutical museum has been opened in Moscow. The first dispensary in Russia was founded by the English pharmacist Jameson French in 1651 but it was intended exclusively for the service of the Tsar, his family and members of the Court. In 1675 a second crown pharmacy was opened in Moscow, and this was empowered to supply medicines to the public. The following year in 1701 Peter I ordered the opening of eight chemists' shops in Moscow. At the present time Moscow possesses ninety-eight chemists' stores, but over 50 per cent of the prescriptions are dispensed by Moscow's three pharmaceutical factories. In 1923 817,000 prescriptions were dispensed in Moscow. In 1933 they made up 4,700,000.

VITAMIN "A" AND "D" PRODUCTS

The Food and Drug Administration has received numerous inquiries about the proper labeling of products represented to contain vitamins A or D or both.

Many products compare their vitamin A and D potency with a stated volume of cod liver oil. If statements of this character are made, they should be literally true. For example, if the label of a medicine states "Each tablet equals one teaspoonful of cod liver oil in vitamins A and D potency" it should contain the same number of vitamin A and D units as would be contained in not less than 4 cc (3.67 Gm) of cod liver oil, of U. S. P. potency. In terms of the U. S. P. standard for cod liver oil which became official on January 1, 1935, this would require each tablet to contain not less than 2200 units of vitamin A and not less than 312 units of vitamin D.

Manufacturers should state vitamin A and D potencies in terms of the new U. S. P. units. Because differences in the clinical efficacy of vitamin D from different sources have been reported, it is desirable, and in many instances necessary in order to meet the requirements of the Federal Food and Drugs Act, to state the source of the vitamins A and D. For example, "From cod liver oil." All direct and implied claims comparing products of this sort with cod liver oil should be true in terms of the new standard for cod liver oil.—W. G. CAMPBELL, *Chief*

PERSONAL AND NEWS ITEMS

The *Southeastern Drug Journal* devoted a number of pages of its May issue in honoring Dr James H Beal

The frontispiece of these pages is a half tone of the honored member Among the tributes the first is that of the Florida Pharmaceutical Association presented by its president Don S Evans, the State Board of Pharmacy, by W M Hankins the University of Florida by Derr Townes R Leigh, The Traveling Mens Auxiliary, by its president Rush St John the officers of the State Association by Max S Adler, Secretary G H Grommet, Victor Wray, C G Hamilton W E Fossett, E P Purcell, Wm R Emrich John K Clemmer J K Atwood, and the wholesale industry of Florida by H C Shuptrine and F C Groover

A testimonial dinner was tendered Dean Ernest Little on May 20th, honoring him for his services to Pharmacy Recognition was given to the various services rendered by the Dean and notably this year fulfilling the office of president of the American Association of Colleges of Pharmacy The dinner was well attended and a delightful and interesting program carried out under the direction of a committee of members of the A Ph A Branch Rutgers University, local and state organizations and other friends

Former President A Ph A Robert L Swain, Deputy Food and Drug Commissioner for Maryland, has been reappointed to the Maryland Board of Pharmacy At the commencement exercises of Washington College Chestertown, Md the degree of doctor of laws will be conferred on him and also on Dr John H Rowland, dean of the Medical School of the University of Maryland

Col Charles Ransom, Medical Corps, succeeds Major General Robert U Patterson as Surgeon General, the term of the former expiring May 31, 1935

Z C Lewis, Montgomery, has been appointed secretary of Alabama Pharmaceutical Association

Paul C Olsen recently made a factual study of the results of stabilization in a typical city retail drug store A second of a series of investigations to determine from actual facts just what profits drug store proprietors are really obtaining on products on which price stabilization policies have been announced and on those not announced is being studied and reports may be obtained from Secretary E L Newcomb, N W D A

The Library Facilities of Washington lists the library of the AMERICAN PHARMACEUTICAL ASSOCIATION

Boericke & Tafel homeopathic pharmacists, of Philadelphia and New York are celebrating the conclusion of the first century of this establishment which later added other branches

The *Scientific Bulletin* published by Laboratorio Quimico Central City of Mexico of April 15th carries a news item, advising that Secretary A L I Winne, Virginia Board of Pharmacy, visited in the City of Mexico The *Bulletin* thanked E G Eberle for advising the staff of Mr Winne's visit and welcomes members of the AMERICAN PHARMACEUTICAL ASSOCIATION Director G G Colin has been a member of the ASSOCIATION for a number of years and is chairman of the Membership Committee for Mexico

A distinctive professional window display has been designed by Merck & Co, Inc, for distribution to retail pharmacists who desire to feature their prescription service to the public This attractive five piece lithographed presentation is intended to portray the professional alliance of the physician, the pharmacist and the manufacturing chemist in promoting health and combating disease

The *Mississippian* of recent date featured the School of Pharmacy of which Prof E L Hammond is dean

In a booklet of "Architects and Sculptors of the Principal Buildings and Monuments in Washington, that of the AMERICAN PHARMACEUTICAL ASSOCIATION is listed and John Russell Pope as the architect The latter is also credited with the Archives Building, Theodore Roosevelt Memorial, Strauss Memorial, Constitution Hall and Scottish Rite Cathedral

Secretary E F Kelly was a speaker at the Illinois Pharmaceutical Association held at Quincy during the week of May 21st his subject being—"The Value and Defects of the Retail Drug Code," Samuel C Henry spoke on "Problems Facing the Drug Trade" W Bruce Philip was a guest at the Chicago Veteran Druggists Association

John C Emerson, Joplin, is the new president of Missouri Pharmaceutical Association, and Kenneth Nichols, of Jefferson City, is the new secretary

The *Pharmaceutical Journal* Great Britain, expressed its loyalty and congratulations to King George in the Silver Anniversary edition of May 4th

Among recent visitors at the American Institute of Pharmacy are the following Ernest L Cushing, Charlestown, Mass, Samuel A Weiss New York City, Dr Arthur E Kennelly, Harvard University, Dr C M Judd Rochester, Minn, Charles E Lyman, New London, Conn, Ralph P White, Youngstown, Ohio, Dean R A Lyman Lincoln, Neb, Dean Ernest Little, Newark, N J G T MacDonald, Shelburne, Nova Scotia, Sam E Welfare, Winston-Salem, N C, A J Du Plessis, Middleburg C P, South Africa,

Dorothy Clapp, St Paul Minn, Mr and Mrs T J McAuliffe, Swampscott Mass, C A Northrup, Visalia, Calif, Robert L Swain Jr Washington College, Maryland Paul A McNeil, librarian of Oliveira Lima Catholic University of America, W M White U S Public Health Service, Joseph A Hailer United Drug Co Boston, Esther H Barney Chicago who so efficiently supervised the AMERICAN PHARMACEUTICAL ASSOCIATION Exhibit at the World's Fair Chicago

OBITUARY

LAWRENCE S WILLIAMS

Lawrence Soper Williams, member of the AMERICAN PHARMACEUTICAL ASSOCIATION since 1910, died April 25th, aged 48 years, after an illness of six weeks.

Mr Williams was a pharmacist in devotion and action who had pride in his profession and



L S WILLIAMS

gave patrons and physicians a better appreciation of pharmaceutical service and is expressed in his address before the Section on Practical Pharmacy in Washington and published in this number of the JOURNAL. His loyalty and enthusiasm were emphasized in an address at the Washington meeting when he was represen-

tative of his classmates and in the presentation made of a wonderful collection of show globes and other museum material (See June JOURNAL, 1934, page 608 and in September issue page 947) These words speak in part for the pharmacist, who was always ready to espouse the cause of pharmacy and had pride in his profession, evidenced by precept and example.

Mr Williams served as president of the Maryland Pharmaceutical Association in 1930 after having been third second and first vice president in successive years. After his term as president he was a member of the executive committee. For more than twenty years he had conducted his pharmacy at Caroline and Preston Streets Baltimore. He started his collection of show globes many years ago and added to these balances, mortars and other collections, and a large selection of these are on permanent display at the American Institute of Pharmacy and expressive of his devotion—a gift to the ASSOCIATION.

The deceased was born in Baltimore, attended the public schools here studied at Baltimore City College and the University of Maryland School of Pharmacy.

Surviving are his widow the former Ida Exall and three children Marguerite, wife of Dr Albert E Sikorsky and Sarah Williams and Lawrence S Williams, Jr.

Mr Williams was a member of the Masonic Order, the Old Town Merchants and Manufacturers' Association and the Baltimore Retail Druggists' Association, in which he had been an officer.

ROBERT R LAMPA

Robert R Lampa, member of the AMERICAN PHARMACEUTICAL ASSOCIATION since 1892 died at his home in Teaneck, N J, April 29th, aged 72 years.

Born in Germany, Mr Lampa came to this country with his parents, and at the age of fifteen obtained a position as errand boy for Lehn & Fink. He studied at night at Cooper Union and later at Columbia University, graduating from both institutions. He went successively into the botanical, drug and chemical departments of the firm, and then was taken into the office as city salesman. After a few years he was made New England representative and served in this post until he was elected vice president. He retired several years ago to devote his time to his pet hobbies of literature and the sciences generally. He published a book of poems called 'Stardust' and for many years was poet laureate for the New York Veterin Druggists' Association of which he had been president twice.

JOHN P. SCHOENTHALER

We are just advised of the death of our fellow-member John P. Schoenthaler of St. Louis on February 19th aged 73 years. The deceased affiliated with the AMERICAN PHARMACEUTICAL ASSOCIATION in 1901.

HON. CLYDE KELLY

The unfortunate death of Hon. Clyde Kelly of Pennsylvania, on April 29th is a severe blow to all those who hope for Federal legislation to prevent unfair trading. Congressman Kelly believed implicitly in the benefits to be derived from the legislation known as the Capper Kelly Fair Trade Bill. He thoroughly understood the principles of this legislation and argued eloquently and worked hard in its behalf. The Capper Kelly Bill, of which he was co-author with Senator Arthur Capper of Kansas, came near to carrying out the realization of his boyhood ambition and aim.

It was due to Congressman Kelly's leadership and sagacity that the NIRA was so framed that limited price stabilization was possible. To the independent retailer his devotion to fair trading endeared him to their hearts. That which can be done best to perpetuate his memory is for every independent retailer and for all drug organizations to fight on aggressively and have Congress pass the legislation that he fathered.—From *W. Bruce Phillips Bulletin* April 30 1935.

DEATH OF DR. WILHELM KOLLE

Dr. Wilhelm Kolle, privy councilor and director of the State Institute for Experimental

Therapy and of the Chemicotherapy Research Institute, George Speyer Haus at Frankfurt died in Wiesbaden, May 10th, after a long illness at the age of 66.

In 1893 Dr. Kolle entered service of the Robert Koch Institute for infectious diseases in Berlin. By order of the State Government he directed a scientific expedition in South Africa from 1897 to 1899 studying the treatment of leprosy and rinderpest. He was sent on a similar mission to the Sudan by the Egyptian Government in 1900.

He was appointed professor of Bacteriology at Bern University in 1906. He succeeded Paul Ehrlich as director of the Frankfurt Institute in 1915. For a long time he was a member of the permanent standardization commission for therapeutical and bacteriological medicine of the League of Nations hygiene committee.

At his death Dr. Kolle was working on elaborate scientific plans particularly connected with cancer research.

CANADIAN HEALTH INSURANCE

According to the *Canadian Pharmaceutical Journal*—on the Commission which Canada proposes to set up there must be a place for the pharmacist, who is one of the health factors in the community. In England under a National Health Insurance he has a definite and responsible position and is recognized in the scheme of things. In the various provinces are established Schools of Pharmacy to educate young men to have a knowledge of drugs and medicines and their compounding. The service the pharmacist renders the community in case of sickness is immeasurable. The diploma hanging on his wall is a guarantee of competency in compounding drugs and we feel sure that the Hon. Dr. Sutherland will include the pharmacist among his appointees to the Royal Commission which he proposes to set up to inquire into State Medicine and Health Insurance.

The *American Professional Pharmacist* has succeeded the *Practical Druggist*. The Editorial Board is composed of Reginald E. Dyer, A. O. Mickelsen, John L. Dandrea and C. Leonard O'Connell.

Make arrangements early to attend the Portland A. Ph. A. meeting.

SOCIETIES AND COLLEGES

AMERICAN COUNCIL ON EDUCATION

The 18th annual meeting of the American Council on Education was held in Washington, May 3-4, 1935. As members of the Council, the American Association of Colleges of Pharmacy was represented by Dean Ernest Little of Rutgers and Dean Rufus A. Lyman of Nebraska. Among the speakers of the meeting known to pharmacy Dr. W. W. Charters delivered an interesting address on "The Motion Picture in Education." The long list of addresses and papers dealt with educational subjects in various phases. Director-Emeritus Dr. Charles Riborg Mann was honored at a dinner presided over by Dr. Frederick B. Robinson of the College of the City of New York.

The American Council on Education was founded in 1918 by prominent educators representing a majority of the national educational associations.

BALTIMORE AND D. C. VETERANS' ASSOCIATIONS

The annual joint outing of the fraters of the Veterans' Associations of Baltimore and the District of Columbia was held at Olney Inn, May 8th. A beautiful day induced a large attendance. Ladies graced the occasion.

NATIONAL CONFERENCE OF PHARMACEUTICAL RESEARCH

Chairman E. N. Gathercoal has addressed the members on the meeting of the National Conference on Pharmaceutical Research at Portland, August 3rd. The annual survey and proceedings of last year were referred to in the February JOURNAL on page 177. Chairman Gathercoal hopes for a large attendance and an interesting program.

He refers to the pharmaceutical tour from Chicago to Portland and return, references to which are made in the April JOURNAL and also in this issue.

CENSUS OF RESEARCH 1934-1935

Dr. James C. Munch, 40 North Maple Ave., Lansdowne, Pa., desires prompt information relative to research being conducted in laboratories and by individuals. In making the report to him the name of the reporter should be given, the laboratory address, the field of investigations and the subject or subjects under investigation. Prompt replies are requested.

GEORGE WASHINGTON UNIVERSITY FELLOWSHIPS

The School of Medicine of George Washington University announces the acceptance of several grants for various research projects as follows: From the Rockefeller Foundation the sum of \$25,500.00 in support of studies in the department of biochemistry; a renewal of the Kane Kotz Fund of \$1700.00 for studies on clinical endocrinology in the department of obstetrics and gynecology from the Eli Lilly Co. the sum of \$1200.00 for a fellowship in biochemistry and a grant of \$1800.00 for the study of the post-pituitary hormones from Parke, Davis and Company.

AMERICAN PHARMACEUTICAL MANUFACTURERS' ASSOCIATION

The American Pharmaceutical Manufacturers' Association will meet at Hershey, Pa., June 3rd-6th, in the foothills of the Blue Ridge Mountains overlooking Lebanon Valley.

AMERICAN DRUG MANUFACTURERS ASSOCIATION

The Wagner bill was a subject of considerable discussion and opposition at the annual meeting of the American Drug Manufacturers' Association at Hot Springs, May 6th to 9th. The executive committee was of the opinion that the Copeland bill required amendment. Tariff bargaining received much attention, the director of Foreign and Domestic Commerce addressed the convention on this subject.

The reports of the officers and of the standing committees conveyed timely and useful information on matters relating to the drug industry and the members of the association in particular.

The annual election resulted in naming the following officers for the ensuing year:

President A. C. Boylston, St. Louis, *First Vice President* Oscar W. Smith, Detroit, *Second Vice President*, John F. Anderson, New Brunswick, N. J., *Third Vice President* L. N. Upjohn, Kalamazoo, Mich., *Executive Vice President and Secretary*, reelected by the executive committee, Carson P. Fraley, 506 Albee Building, Washington. *Treasurer*, S. DeWitt Clough, North Chicago, Ill., *General Counsel* Horace W. Bigelow, Detroit.

MARYLAND AND DISTRICT OF COLUMBIA ASSOCIATION

The Maryland and District of Columbia Pharmaceutical Associations will meet in Baltimore, June 25th-28th

WEST VIRGINIA UNIVERSITY

Students of West Virginia University, Department of Pharmacy, toured May 5th in a caravan of six cars to visit the plant of Parke Davis & Co., in Detroit. The group was accompanied by Prof. and Mrs. J. Lester Hayman.

MINNESOTA ASSOCIATION

The following results of the recent mail ballot of Minnesota Pharmaceutical Association have been announced: *President* Roy G. Paulson, Fairmont, *Vice Presidents*, Jesse B. Slocumb, St. Paul, Orlando Didra, Waseca, and L. M. Herbert, Worthington, *Secretary*, A. Roy F. Johnson, *Treasurer* Charles T. Heller, Jr., St. Paul. *Executive Committee* man Joseph Vadheim, Tyler.

KANSAS ASSOCIATION OFFICERS

Kansas Pharmaceutical Association met in Wichita, April 9th to 11th, the following officers were elected: *President* A. H. King, Manhattan, a member of the State Board of Pharmacy for nine years, *First Vice President*, Percy S. Walker, *Second Vice President* Paul Schultz, Beloit, *Treasurer*, Walter Varnum, and Dean Havenhill. Lawrence was renamed librarian.

It is contemplated to urge the use of the funds of the State Board of Pharmacy to underwrite the publication of the 'History of Pharmacy in Kansas,' by Matt Noll.

GOLDEN ANNIVERSARY MEETINGS

The Chicago Retail Druggists Association has held its 50th anniversary meeting. A most interesting program was provided and carried out and a special edition of the *C R D A News*, May 4th, was issued. The celebration took place at College Inn Hotel Sherman and was participated in by the members and representatives of national, state and local organizations. The Jubilee banquet was held on May 9th.

Tennessee Pharmaceutical Association will celebrate its 50th anniversary July 15th-18th in Memphis. Elaborate preparations are made for the event under direction of Chairman Ed Sheely.

U S P AND N F PUBLICITY COMMITTEE, MARYLAND

The sixth group of prescriptions has been mailed to Maryland physicians under the direction of Chairman Marvin J. Andrews. These comprise preparations for Dermatitis, Anti-Pruritic Lotion, Insect Skin Lotion, Poison Ivy, Acne, Prickly Heat Lotion, Burns, etc. Criticisms and suggestions are invited and the work has been eminently successful.

IMPROVED METHOD CUTS COST OF MAKING CALCIUM GLUCONATE

A cheaper and faster method for making calcium gluconate, commonly prescribed for expectant mothers and others who need calcium, was reported April 23rd, before the American Chemical Society in New York City by H. T. Herrick, R. Hellbach and O. E. May, chemists of the U. S. Department of Agriculture.

The discovery is based upon a more efficient use of molds as fermentation agents. Molds have been used for centuries in the manufacture of Roquefort and Camembert cheese and more recently for making citric and gluconic acid.

Six years ago Herrick and May discovered a mold that produces gluconic acid from glucose or corn sugar. This acid is important in the manufacture of calcium gluconate, which until that time sold for about \$150.00 a pound. When this pure culture mold was put to work making gluconic acid, the rare chemical could be made for 50 cents a pound. The improved process now cuts the cost still more.

Because molds must have air—the same as most other forms of plant life—the chemists grew them on the surface of shallow pans in the laboratories of the Bureau of Chemistry and Soils, at Arlington Farm, Va. The method can be adapted to commercial use but the necessity of using large pans has been a decided handicap in large scale operations. Information from the U. S. Department of Agriculture.

Dr. Howard B. Lewis, director of the College of Pharmacy of the University of Michigan and professor of physiological chemistry in the Medical School, has been elected a member of the National Board of Medical Examiners of the United States, to succeed the late Professor Otto Folin of Harvard University.

LEGAL AND LEGISLATIVE

CODE MEETING

A meeting of delegates representing various codes was held in Washington, Constitution Hall May 22nd. The urgency of continuation of the NRA for a period of two more years was voiced and the progress made under present conditions, even though largely initiative, was generally voiced.

Steps were taken to impress the continuation on Congress.

STATE LEGISLATURES

The following legislatures are still in session: Alabama, California, Connecticut, Florida, Illinois, Massachusetts, Michigan, Missouri, Nebraska, New Hampshire, New Jersey, North Carolina, Ohio, Pennsylvania, South Carolina, Texas, Wisconsin; other states had no sessions or have adjourned.

FOOD AND DRUG BILL

An agreement is said to have been reached by Senators Royal S. Copeland and Josiah W. Bailey. The principal matters involved in the agreement include:

- 1 A separate definition for devices, removing them from classification as drugs
- 2 A definition of scientific opinion
- 3 A variations clause similar to that in the present law
- 4 False advertising to be classed as misbranding instead of adulteration
- 5 Liberalization of the definition of "germicide"
- 6 A more restricted provision for factory inspection
- 7 Multiple seizures prohibited in charges of misbranding except where imminently dangerous to health and provision for consolidating multiple seizures for a single trial
- 8 Specific provision that no power is taken from the Federal Trade Commission

NATIONAL RECOVERY
ADMINISTRATION

At a conference, on May 16th, with the National Industrial Recovery Board the President approved the following recommendations which had been unanimously adopted by the Board and submitted to him:

- 1—*Two year extension* This time is necessary to obtain the cooperation of industry in

the formulation of codes, with assurances to management and labor of reasonably permanent conditions. It is necessary code administration to strengthen enforcement through judicial approval of methods, and to prevent the entire breakdown of labor and fair trade practice provisions by chiselers who are already at work undermining the standards of fair competition. The extension of NRA for a few months will bring rapid deterioration and disintegration of the whole industrial recovery program.

2—*Adequate period for the revision of codes*—three to six months

3—*Improved statement of legislative policies and standards* to give additional guidance and authority for administrative action

4—*Jurisdiction of NRA limited to industries engaged in, or SUBSTANTIALLY affecting interstate commerce*. This will prevent the NRA from taking in too much territory and will strengthen its legal authority.

5—*Provision for voluntary codes and adequate authority* for imposition of limited codes. Both are necessary. Voluntary codes to encourage improved business practices, including appropriate labor provisions. Limited codes to insure minimum wages, maximum hours, prohibition of child labor and Section 7(a).

6—*Definite authority and standards* for the NRA to prevent unfair competitive practices especially those tending to monopoly and destruction of small enterprises.

7—*Methods of code making and enforcement* should be further defined, with enforcement primarily through injunction or cease and desist orders, and with provision for adequate protection of individual rights and small enterprises through opportunity for hearing and judicial review and public control of all compulsory processes.

MARYLAND LEGISLATION

The *Maryland Pharmacist* defines and explains new Maryland legislation. The Gross Receipts Tax—the accounts received are for purposes of unemployment relief and old age pensions. Drug Store Permit Law—Under this law no person copartnership, association or corporation may operate, maintain, open or establish any pharmacy in this state except under a permit issued by the Maryland Board of Pharmacy.

Permits are required for the manufacture of drugs, medicines etc

All false and misleading therapeutic claims are barred from the label of all drugs and medicines

Poison Law—This law repeals the Old Poison Law enumerates the poisons, defines labels, the law deals only with sales at retail Drug Store Inspection Law—Under this law every drug store must possess the later revisions of the U S Pharmacopœia and National Formulary and must be properly equipped

The Maryland Board of Pharmacy and the State Department of Health are given power to inspect all drugs and medicines manufactured or sold within the state, and to inspect during business hours any pharmacy or other place where drugs or medicines are manufactured or kept for sale

Barbital Law—This law prohibits the sale of barbital trional etc except on prescriptions Pure Food and Drugs Act adds labeling and misrepresentation clauses Patent Medicine shows and unsafe sampling are prohibited under House Bill 604

The State Narcotic Law repeals the old State Narcotic Act and replaces it with an improved version of the Uniform State Narcotic Act The records under the Federal Narcotic Act are expressly adopted under the State Act

The foregoing are very brief statements abstracted from the report referred to

RESTRICTIONS ON SALES IN OHIO

Acting within its authority to issue regulations and extend the list of drugs confined to sales by registered pharmacists the Ohio State Board of Pharmacy has made material additions to its list of drugs which cannot be sold through general merchants The list comprises more than 200 items

Columbus, Ohio—The Ohio State Pharmaceutical Association and the Ohio Board of Pharmacy are objecting to a provision in the bill which permits doctors to dispense a maximum of four grains of opium or its equivalent in other narcotics without prescription

JAPANESE SCHOOLS OF PHARMACY

Dr Yoshio Sugu, dean of the Women's Department in the Tokyo College of Pharmacy, was appointed the head pharmacist of the hospital attached to the Hokkaido Imperial University, and his former post is now occupied by Professor Shichiro Akiya of the same college The Tokyo College of Pharmacy is

situated at Ueno Sakuragi-cho, Shitaya-ku Tokyo

The American Association of Colleges of Pharmacy was accepted as an associated society of the American Association for the Advancement of Science

CONGRESS OF PHARMACY

The Congress of Pharmacy, as before stated convenes in Brussels, July 30th to August 6th

A program of the papers which are to be submitted to the Scientific Section of the International Congress of Pharmacy has been published in the *Journal de Pharmacie de Belgique* Among the papers to be presented are the following

Prof J H Burn on "The Standardization of Oestrin and Male Hormone," H Berry on 'The Stability of Strophanthum Solution,' T E Wallis on 'Structural Standards for Crude Drugs,' Dr W H Linnell on 'Halogen Analogues of Ephedrine and Adrenaline,' A La Grange and N Wattiez 'A Critical Study of the Methods of Assay of the Alkaloids in the Official Preparations of Belladonna in the Belgian Pharmacopœia 1930,' A J J Van der Velde, 'Research on the Sterilization and Biochemical Control of Pharmaceutical Products,' Prof Herrmann and Monsieur Hebert, 'Criticism on the So-called Chemical Reactions of Cannabis Indica,' Monsieur Snejko's 'The Problem of Unifying Pharmaceutical Nomenclature in an International Pharmacopœia'

On Saturday and Sunday, August 3rd and 4th, the Congress goes to Antwerp to celebrate the centenary of the Societe de Pharmacie d'Anvers and closes officially on August 5th

FAIR TRADE LEGISLATION

California, Iowa, Maryland, New Jersey, New York, Oregon, Washington, Wisconsin enacted a Fair Trade law Alabama Connecticut Indiana Michigan Minnesota, Montana Nebraska, Nevada Oklahoma Pennsylvania South Dakota, Texas, Utah Wyoming introduced fair trade bills

George A Bunting entertained members of the Baltimore Veteran Druggists' Association at his home for those whose birthdays were celebrated in April among them, the host, Frank C Purdum, A G DuMez and William G Lauer

Make arrangements early to attend the Portland A Ph A, meeting

THE PORTLAND MEETING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

The following paragraphs are culled from the letters of President R. P. Fischelis and Local Secretary A. O. Mickelsen.

'In less than three months the AMERICAN PHARMACEUTICAL ASSOCIATION will hold its Eighty Third annual meeting at Portland Oregon. For the first time in its history the ASSOCIATION has selected the Pacific Northwest as its center of activities for the week which is annually devoted to planning the major activities of American Pharmacy for the ensuing year. Much has occurred since we met in Washington, D. C. to dedicate the Headquarters Building, and the officers and committees will have reports to present at the annual convention which will be full of important and valuable information both from a scientific and a practical standpoint.'

The State Pharmaceutical Associations of Oregon, Washington and Idaho will hold a history making tri-state convention in Portland August 4th to 8th, which will add greatly to the interest and attendance of the A. P. H. A. convention.

"The Bonneville Dam, a \$32,000,000.00 project, will be visited by A. P. H. A. delegates on Saturday, August 10th, when they will be taken up the world-famed Columbia River Highway for an all day scenic drive and luncheon featuring famous Columbia River salmon. No other section in the world could duplicate this pleasure trip."

DETROIT BRANCH A. P. H. A.

The College of Pharmacy, University of Michigan and the Detroit Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION sponsored a meeting for May 23rd. President Alexander G. Ruthven of the University, welcomed the visitors and members. Dean Charles B. Jordan discussed Food, Drug and Cosmetic Legislation, Edgar H. Gault spoke on "The Ethics of Modern Advertising," Dr. Louis H. Newburgh's subject was Drugs and Nutrition, and Dr. H. H. Willard presented Ultra Violet Fluorescence as Applied to Problems of Chemistry and Pharmacy. A dinner was part of the program and the Branch elected officers for the ensuing year.

GOLDEN JUBILEE MEETING OF THE NATIONAL EDITORIAL ASSOCIATION

Celebrating the 50th birthday of the National Editorial Association, prominent personages of

the Fourth Estate gathered at New Orleans May 4th-12th, from all parts of the nation to participate in an outstanding program for its 50th Anniversary meeting.

RETAIL DRUG TRADE BUDGETS

The National Code Authority for the Retail Drug Trade has made application for extension of its Budget and Basis of Contribution and of the Budgets and Bases of Contribution for certain of its Local Committees which were approved for the period from November 1, 1934, to April 30, 1935, such extension to cover the period from April 30, 1935, to June 16, 1935. The National Industrial Recovery Board has May 13th signed an Order, No. 60-430 approving such extension, such approval being effective fifteen (15) days from the date hereof unless prior to that time good cause to the contrary is shown and a subsequent order is issued.

In a letter directed to all Code Authorities released May 15th, the National Industrial Recovery Board sharply differentiated between code administration and trade association activities, advising code authorities that expenses for trade association functions would not be approved unless such activities are specifically authorized in the code.

THE NRA DECISIONS

The general views expressed in the press that the NRA would be granted extension were typed for these columns but had to be deleted as the decisions of the United States Supreme Court of May 27th, necessitate action by Congress. The general opinion in Administration circles now is that the NRA can be redrafted to conform with the decisions, under the conditions that have developed there is no certainty as to what the effect of the decisions will mean in connection with pending legislation.

The decisions should stimulate study and cooperative action by code authorities, the divisions of the industry and the organizations which are in accord relative to the possibilities of establishing fair trade practices as contemplated by the codes.

The Texas Legislature amended the Texas Pharmacy Law lowering the annual renewal certificate fee from \$3.00 to \$2.00 and the members of the Board of Pharmacy are allowed \$10.00 per day during active work at examination sessions.

BOOK NOTICES AND REVIEWS

A Text Book of Pharmacognosy By GEORGE EDWARD TREASE, B Pharm, PhC, Lecturer on Pharmacognosy in the University College of Nottingham, with contributions by H H Barker W R Heading, H M Hirst and A H Ware vi + 653 pp, 187 figs Baltimore, Wm Wood and Co 1935 Price \$6 00

This new text in pharmacognosy is stated by its English author to cover the requirements in pharmacognosy of students reading for pharmaceutical examinations in most English speaking countries

Its contents are arranged in three parts, an appendix and index. Part I, entitled "General Principles" comprising 132 pages, contains a brief chapter on historical pharmacognosy which is followed by a chapter dealing with the cultivation of medicinal plants by H M Hirst and by three chapters dealing, respectively, with enzymes, vitamins and hormones by H H Barker. There next follow chapters by the author on the collection, drying and storage of drugs, insects and other pests in drugs. London commerce in crude drugs, one on plant principles and their extraction by W R Heading, another on tests for plant phenols as an aid to drug identification by A H Ware and two by the author on the microscope as an aid to drug identification and filtered ultra-violet light as an aid to drug identification.

Part II, entitled "Drugs of Vegetable Origin," comprising 462 pages contains a chapter called "Introduction" which briefly summarizes some facts concerning plant classification and nomenclature, and eight chapters dealing with the drugs of the Thallophytes, Pteridophytes, Gymnosperms and Angiosperms which the author has arranged into phyla and subphyla.

Part III contains an introductory chapter of a page dealing with classification of animal drugs and a chapter on animals and animal products. The appendix contains nearly six pages devoted to a glossary of Latin words used in naming species.

In adopting the taxonomic method of presenting the subject matter on animal and vegetable drugs the author has followed what the experience of many of his fellow teachers have found to be more satisfactory than the morphologic method. A condensed morphological classification in addition however, would seem desirable especially for correlating

the drugs representing similar organs or cell contents.

The chapter on the cultivation of medicinal plants is well written and gives sufficient information on this topic for the time allotted for their presentation of this phase of pharmaceutical botany in the average undergraduate curriculum. For purposes of the growers of medicinal plants, however, the information given under many of the species is too scant to be regarded of more than elementary value.

The chapter on hormones is on the whole well written and an innovation in the average pharmacognosy text. It is somewhat surprising that we note no mention under the Anterior Pituitary of the hormones Prolan A and Prolan B and no mention of the hormone Progesterin of the Corpus Luteum.

Another innovation in a text of this kind is the chapter on "Filtered Ultra Violet Light as an Aid to Drug Identification." Fluorescence analysis as applied to crude drug identification has made rapid progress within the past decade and its evidence is often of some value in pharmacognosy when taken in conjunction with evidence derived from other sources. The fundamentals of this comparatively new field including an adequate description of the Hanovia analytic quartz lamp and brief notes on the examination of types of pharmaceutical products are included in this chapter.

In the consideration of most of the crude drugs the following order of treatment is noted: British pharmacopoeial title or general Latin title, synonyms, source and collection history, characters, constituents, substitutes and uses. Under characters the physical characteristics are given with usually the outstanding diagnostic histological features.

It is surprising that one finds no mention of powdered drugs in various drug monographs especially since this phase of pharmacognosy is usually more needed in general pharmaceutical work than that of identifying the whole drug. In many instances, also, the treatment of the microscopical characteristics of the whole drug is inadequate, and insufficient data are given on adulterants. Most of the figures are good and have been borrowed from a variety of sources.

The work as a whole is creditable and should serve as a text on pharmacognosy in colleges where British standards are taught providing

the data on histological details and adulterants and substitutes are amplified in the lectures. It may well serve as a reference for students of pharmacognosy generally.—H W YOUNG-KEN

Annual Survey of American Chemistry Volume IX, 1934, edited by CLARENCE J WEST, Director, Research Information Service National Research Council published for the National Research Council, by Reinhold Publishing Corporation New York, 400 pages Price \$4.50

The Annual Survey of American Chemistry for 1934 follows the same general principles as preceding volumes with the exception that this year the chapter on Biochemistry has been omitted. The reason assigned for the omission is that the Annual Survey of Biochemistry is fully covered by the Annual Survey of Biochemistry published by the Stanford University Press. Most of the contributors have been represented in previous volumes all of them outstanding in their special fields. The volume has 400 pages and is presented in twenty-five chapters half of them are concerned with industrial subjects and suggest the trends in the industry as well as the accomplishments of the period.

Each chapter is followed by references, citing the subjects discussed. The Authors' Index, in three columns, covers twenty pages and gives an idea of the completeness with which the subjects are dealt.

Previous volumes have been reviewed in this publication and the favorable comments made in these editions apply to this volume.

The Law of Patents for Chemists By JOSEPH ROSSMAN Patent Examiner, U S Patent Office member of the bar of the U S Court of Customs and Patent Appeals and the U S Supreme Court editor of the *Journal of the Patent Office Society* published by the Williams and Wilkins Co., Baltimore, Md. Price \$4.50

The publishers state that this is a work both for study to familiarize the reader with the essentials of Patent Law and for regular reference and to guide the inventor in practical matters pertaining to his protection. These matters are discussed in Part I. Part II discusses the essentials of Patent Law principles. Part III speaks of obtaining the patent. Part IV of the patentee's rights under the law.

The table of cases and the Index indicates the large number of important cases which have relation directly or indirectly to the drug industries.

The Glossary of ten pages defines words and phrases most commonly used in patent law. The author states that no attempt has been made to give exact legal definitions or explanations but rather to translate such terms into concise English so that they may be understood and used by the reader.

A Table of Contents shows that the book is divided into twenty one chapters and has been divided for study and presentation.

The makeup of the book shows the usual care given by the publishers.

The Law of Drugs and Druggists A treatise with text, cases, statutes, readings and digests for schools of pharmacy, retail, wholesale and manufacturing druggists, by WILLIAM R ARTHUR Professor of Law at the University of Colorado published by West Publishing Co., St Paul. Price \$3.00

The volume is dedicated to his friend, Col. Homer C Washburn, dean of the School of Pharmacy, University of Colorado. It is stated in the Preface that the volume was commenced many years ago by Dean Washburn and the author of the volume but not completed until recently. Professor Arthur has been giving a short course on Drug Law to the Senior classes of the School of Pharmacy of the University of Colorado largely reviews of cases and the text is largely the result of these studies in analyzing litigations and cases in courts to bring out important details of laws relating to Pharmacy and allied branches. The book is divided into three parts: the first is a presentation of state and local laws, the second part of Federal statutes and regulations, and the third, in the form of an appendix includes further references to food and drug legislation narcotic and poison laws. The table of cases cited and discussed, covers ten two-column pages. The list is followed by a Glossary explaining the terms and definitions in law procedure. Sixty pages are given to the Index.

The book is well printed and bound and will be found of value when information relative to laws of the drug trade and industries is needed.

SEPARATE FORMS OF THE ABSTRACT SECTION

Extra forms of the Abstract Section can be supplied at 25 cents per set. This new service was begun in the March JOURNAL and will be continued each month. Order from the AMERICAN PHARMACEUTICAL ASSOCIATION, 2215 Constitution Ave. Washington D C

FAIR TRADE MEASURES

Governor La Follette, of Wisconsin has signed the Alfonso fair trade bill the Iowa Legislature has adopted the Berg fair trade bill and transmitted it to Gov. Clyde L. Herring. Both

the Wisconsin and the Iowa measures are based on the California Junior Capper Kelly law. Pennsylvania, Maryland, New Jersey, New York and other states have taken similar action or contemplate perfecting such legislation.

NOTICE TO CONTRIBUTORS TO THE JOURNAL AMERICAN PHARMACEUTICAL ASSOCIATION

The following notice has been prepared from comments received from members of the Board of Review of Papers and of the Publication Committee.

Manuscripts should be sent to Editor E. G. Eberle, 2215 Constitution Ave., N. W., Washington, D. C.

All manuscripts should be typewritten in double spacing on one side of paper $8\frac{1}{2} \times 11$ inches, and should be mailed in a flat package—not rolled. The original (not carbon) copy should be sent. The original drawings, not photographs of drawings, should accompany the manuscript. Authors should indicate on the manuscript the approximate position of text figures. All drawings should be marked with the author's name and address.

A condensed title running page headline not to exceed thirty five letters, should be given on a separate sheet and placed at the beginning of each article.

The method of stating the laboratory in which the work is done should be uniform and placed as a footnote at end of first page giving Department, School or College. The date when received for publication should be given.

Numerals are used for figures for all definite weights, measurements, percentages and degrees of temperature (for example 2 Kg., 1 inch, 20.5 cc., 300° C.). Spell out all indefinite and approximate periods of time and other numerals which are used in a general manner (for example one hundred years ago, about two and one half hours, seven times).

Standard abbreviations should be used whenever weights and measures are given in the metric system, e. g. 10 Kg., 22.5 cc., etc. The forms to be used are cc., Kg., mg., mm., L. and M.

Figures should be numbered from 1 up, beginning with the text figures (line engravings are always treated as text figures and should be designed as such) and continuing through the plates. The reduction desired should be clearly indicated on the margin of the drawing. All drawings should be made with India ink, preferably on white tracing paper or cloth. If coordinate paper is used, a blue-lined paper must be chosen. Usually it is desirable to ink in the large squares so that the curves can be more easily read. Lettering should be plain and large enough to reproduce well when the drawing is reduced to the width of a printed page (usually about 4 inches). Photographs intended for half tone reproduction should be securely mounted with colorless paste.

"Figure" should be spelled out at the beginning of a sentence, elsewhere it is abbreviated to 'Fig.' per cent—2 words.

The expense for a limited number of figures and plates will be borne by the JOURNAL, expense for cuts in excess of this number must be defrayed by the author.

References to the literature cited should be grouped at the end of the manuscript under the *References*. The citations should be numbered consecutively in the order of their appearance (their location in the text should be indicated by full sized figures included in parentheses). The sequence followed in the citations should be Author's name (with initials), name of publication, volume number, page number and the date in parentheses. Abbreviations for journals should conform to the style of *Chemical Abstracts*, published by the American Chemical Society.

(1) Author, A. Y., *Am. J. Physiol.*, 79, 289 (1927).

Papers presented at the Sections of the AMERICAN PHARMACEUTICAL ASSOCIATION's annual meeting become the property of the Association and may at the discretion of the Editor be published in the JOURNAL. Papers presented at these Sections may be published in other periodicals only after the release of the papers by the Board of Review of Papers of the JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

The Editor will appreciate comments from Board of Review and Committee on Publication, members, authors and others interested.

NEARER AND NEARER TO CONVENTION TIME

PLAN YOUR TRIP TO PORTLAND

The time for the annual meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION, August 5th-10th, is fast approaching and a most elaborate program has been arranged. Partial programs are published in this issue of the JOURNAL.

F C Felter, of the Publicity Committee, says that the AMERICAN PHARMACEUTICAL ASSOCIATION, with "A Pharmaceutical Air," will descend upon Portland, Ore., August 5th to 10th, when pharmacists from all corners of the United States take over the City of Roses and literally transform it into a "City of Mortars and Pestles."

As a convention city, Portland has a charm and beauty of surroundings perhaps unexcelled by any large community in America.

Hotel Multnomah Will Be the A PH A Headquarters

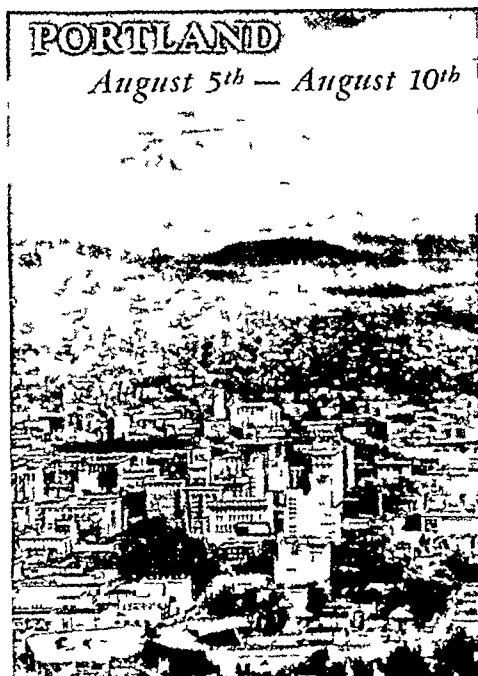
In order to stimulate a representative attendance the several Associations have approved a "Pharmaceutical Tour." Thus you may combine duty and business with a vacation of care-free ease—a vacation of scenic grandeur, varied interests, education and adventure.

The "Pharmaceutical Tour" has been carefully planned for your convenience, comfort and pleasure at extremely low all-expense rates. You will tour through Glacier National Park, the Canadian Rockies at Banff and Lake Louise, and view the virile beauty of the Pacific Northwest. We invite your exacting comparison with other trips offered, for here is a full measure of travel gems with the maximum of luxurious comfort, scenic attractions and pleasure at a minimum cost.

For further information address

A O MICKELSEN, *Local Secretary*, N E 6th Ave. at Oregon St., Portland, Ore
H C CHRISTENSEN, 130 No Wells St., Chicago, Ill
E N GATHERCOAL, 701 So Wood St., Chicago, Ill
C B JORDAN, Purdue University, La Fayette, Ind

See also Advertising Section of the JOURNAL for April, page VII, May JOURNAL, pages IX, XVIII and XXIV, and other references in this issue of the JOURNAL.



Portland the Convention City,
with Mt Hood in the Background



FRANK H EBY

JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

VOL XXIV

JUNE, 1935

No 6

THE CHAIRMAN OF THE PLANT SCIENCE SEMINAR

Frank H Eby, chairman of the Plant Science Seminar, 1934-1935, was born in Lancaster County, Pa, in 1896, a few miles from where his early Pennsylvania Dutch ancestors settled in 1715 Here he received his early education and also served his first years of apprenticeship in pharmacy Later, he was employed in the stores of George B Evans and William J Pechin of Philadelphia In 1919, he received his diploma from the School of Pharmacy of Temple University and, in 1921, he was awarded the degree of Doctor in Pharmacy from the same institution

Professor Eby has been a member of the faculty of Temple University since 1920 and at present is professor of Botany and Pharmacognosy in the School of Pharmacy

He served as secretary of the Philadelphia Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION in 1929-1930 and as president of the Branch in 1933-1934 He is a member of the Pennsylvania Pharmaceutical Association and has held membership on a number of committees of this organization, at present he is chairman of the Committee on Biology and Pharmacognosy He is a member of the Committee on Materia Medica, Boards of Pharmacy and Colleges of Pharmacy, District No 2

During the World War Mr Eby served as a pharmacist in the Navy He is past-commander of the local Legion post, a member of the Blue Key Fraternity, Kappa Psi Pharmaceutical Fraternity and has always taken an active part in Boy Scout affairs

Professor Eby married Dorothy M Keller of Harrisburg in 1921, they have one son

Officers of the Plant Science Seminar *Chairman* Frank H Eby, *Vice-Chairman* L K Darbaker, *Secretary* *Treasurer* F J Bacon, *Executive Committee*, C E F Mollett, E B Fischer
Founded 1925, *Founder*, E L Newcomb

EDITORIAL

E G EBERLE, EDITOR

2215 Constitution Ave., WASHINGTON, D C

THE INTERNATIONAL CONGRESS OF PHARMACY

PRESIDENT GENERAL R PATTOU of the International Congress of Pharmacy has advised that he will occupy himself with the questions of a professional nature concerning the free choice of pharmacists for organized pharmaceutical services. He desires to be advised as to how in the United States are pharmacists designated for furnishing medical supplies to organized services?

By "organized services" he understands those which are organized with the intervention

(a) Of the *Public Authorities* The Federal Government, States, Municipalities

(b) Of *Social Insurance Institutions*

(c) Of *Mutual Aid Societies*

(d) Of *Companies Insuring against Industrial Accidents*

(e) Of any other organizations

He also desires to know whether all established pharmacists are authorized as a matter of right to have a part in furnishing supplies, in case certain conditions must be met in order to engage in furnishing supplies, what they are and what the opinion is of the pharmaceutical profession in the United States on the subject of free choice of pharmacists

Comment has been made on the International Congress of Pharmacy in prior issues of the JOURNAL. The general secretary is J Breugelmans, pharmacist of Brussels

THE EIGHTH INTERNATIONAL CONGRESS OF MILITARY MEDICINE AND PHARMACY

THE Eighth International Congress of Military Medicine and Pharmacy will be held at Brussels, Belgium, from June 27 to July 3, 1935. The change of place from Bucharest to Brussels was made on account of the death of Prof Butoianu, Surgeon General of the Roumanian Army

The Seventh Congress, held at Madrid in 1933, proposed the following topics which will be considered at the forthcoming Congress

1 "Principles of Organization and Function of the Medical Service in Mountain Warfare" Reporters Roumania and Italy

2 "Determination of Aptitude for the Various Specialties in the Medical Services of the Army, Navy and Air Force" Reporters Roumania and France

3 "Sequelæ of Wounds of the Abdomen" Reporters Roumania and the United States

4 "Researches Concerning Standardization of Methods of Analysis of Foods and Drinks for the Use of the Soldier" Reporters Roumania and Czechoslovakia

5 "Buccal-Dental Prophylaxis at the Front" Reporters Roumania and Lithuania

6 "Comparative Study of the Medical Administrative Services of Various Armies, Navies and Air Services" Reporters Roumania and Chile

The Brussels Congress will doubtless be as important and interesting as those which have gone before it. As Roumania was to have entertained the Congress, each discussion, in keeping with the usual custom, is opened by representatives of Roumania. Information regarding the meeting may be had from the Secretary of the Association of Military Surgeons of the United States, Army Medical Library, 7th and B Sts., Washington, D. C.

These data were obtained through courtesy of *The Military Surgeon* of June 1935

PHARMACISTS AND PUBLIC HEALTH SERVICE

PHARMACISTS have an important part in public health service and first aid, represented not only in bringing medical attention to the injured and suffering, but in supplying materia medica which will afford relief and prevent spread of disease. An unusual case, in Washington, within the past month, presents several phases. Two young men, a freshman at George Washington University and a Government employee, were on a hike on the Chesapeake and Ohio Canal tow-path—when the former was bitten by a copperhead. Fortunately, the snake was seen and the danger recognized, but strange to say, neither of the young men had a pocket-knife. Safety prompted the use of nature's provision (the teeth) in opening the wound and bringing about flow of blood, and further comradeship was shown in the act of carrying the crippled man a distance of two miles. The purpose of this comment follows.

Interns treated the wound with an antiseptic and, later, the young man was discharged and returned home, soon the leg began to swell. The boy's father, a chemist, called the family doctor, who advised that because snake-bites are rare, he was not informed relative to efficient treatment. Dr. William F. Mann, director of the Zoo, advised the injection of a serum which was supplied by a well-known professional pharmacy, the injection was given and the young man's life saved. The unusual occurrence brought difficulties and, throughout, the finest cooperation, this is a purpose of the comment and presents several thoughts from which lessons may be drawn.

Bites and stings are vacation handicaps and so are the effects of contact with poisonous plants, and it is the pharmacist's duty to supply the means of relief and the antidotes, and therefore, inform himself relative to the best means of service. The Ohio State Division of Conservation broadcasts information on ivy poisoning and as a preventive suggests the use of the wash devised by Dr. J. B. McNair—a 5 per cent solution of ferric chloride in a 50–50 mixture of water and glycerin. The exposed parts of the skin are washed with the preparation and allowed to dry, the iron in the latter combines with the poison and prevents its ill-effects.

It is advisable to destroy the poison of the plant or insect, for bites, the general rule may be laid down to neutralize the poison, usually of an acid nature, soothe, don't scratch. Breeding places for mosquitoes and other insects are a menace, their activities are dangers to public health.

This comment is for pointing to the pharmacists' place in health service.

SCIENTIFIC SECTION

BOARD OF REVIEW OF PAPERS — *Chairman*, F E Bibbins, George D Beal, I W Rising, H M Burlage, L W Rowe, John C Krantz, Jr, Heber W Youngken

DRUG EXTRACTION II THE EFFECT OF FINENESS OF POWDER AND OF VARIATION IN SOLVENTS ON THE PERCOLATION OF BELLADONNA ROOT^{1 2}

BY WILLIAM J HUSA³ AND C L HUYCK⁴

In connection with the general study of the fundamental principles of drug extraction which is being carried out in the Department of Pharmacy of the University of Florida it seemed desirable to investigate the extraction of a series of drugs of different types Belladonna root was selected as representing a simple type of plant structure containing alkaloids as the active constituents The work reported in this paper covers research on the swelling of belladonna root in various solvents and the effect of fineness of powder and variation in solvents on the percolation of belladonna root

EXPERIMENTAL PART

Materials Used — Except where otherwise specified, the belladonna root used was from the 125 lb shipment previously described (1) A thorough pharmacognostic study was made and it was found that the shipment conformed to the U S P description

Swelling of Strips — Using the technique (1) of making measurements with a filar micrometer of the width of thin strips of cross sections before and after the addition of solvents, the swelling of the wood of belladonna root in various liquids was determined Cross sections 0.10 to 0.15 mm thick were cut by means of a sharp carpenter's plane The results, which in each case are the average of several determinations, have been expressed on a percentage basis, taking the width of the dry strips as 100

TABLE I — THE EFFECT OF ALCOHOL-WATER MIXTURES ON THE WOOD OF BELLADONNA ROOT

Vol. of Alcohol	Vol. of Water	Average Width of Strips of Cross Sections (Dry = 100) after Time Intervals in Minutes							
		0	1	3	10	20	40	60	90
0	1	100	110	109	110	110	110	113	112
1	3	100	110	109	109	110	110	112	110
1	2	100	106	105	109	111	111	111	112
1	1	100	105	105	105	106	106	106	
3	2	100	102	101	102	102	103	104	103
7	3	100	102	101	102	102	104		
4	1	100	101	101	101	101	103	103	
5	1	100	101	101	102	102	102	101	101
9	1	100	101	102	102	102	102	102	
1	0	100	101	100	100	100	100		

Table I shows that a mixture of 1 vol. of alcohol and 3 vol. of water gave the same swelling curve as water alone As the percentage of alcohol increased there was an increasing tendency to

¹ Scientific Section, A. P. H. A. Washington meeting 1934

² This paper is based on a thesis presented to the Graduate Council of the University of Florida by C. L. Huyck, in partial fulfillment of the requirements for the degree of Master of Science in Pharmacy

³ Head Professor of Pharmacy, University of Florida

⁴ Graduate Scholar, University of Florida, 1932-1933

ward a smaller primary swelling and a smaller total swelling during the period of the test. Alcohol has practically no effect of swelling or shrinking on the wood of belladonna root. Tests made with drug from another shipment gave similar results with the exception that the initial swelling in water was about 30% instead of 10%. It seems likely that the percentage swelling may vary according to the age of the root and the extent to which it has been dried. According to Gortner (2) bio colloids show a decrease in imbibition capacity with age, old plant tissues being in general less highly hydrated than are the younger tissues.

TABLE II—THE EFFECT OF GLYCERIN-WATER MIXTURES ON THE WOOD OF BELLADONNA ROOT

Vol of Glycerin	Vol of Water	Average Width of Strips of Cross Sections (Dry = 100) after Time Intervals in Minutes							
		0	1	5	10	30	60	90	120
1	0	100	100	100	101	103	104	105	106
4	1	100	103	103	105	108	108	108	108
3	2	100	105	106	106	107	107	107	107
1	1	100	108	108	108	108	108	109	109
1	3	100	108	110	110	110	110	111	112
1	7	100	108	109	109	110	110	110	110

The above results indicate that glycerin causes a gradual swelling of the wood of belladonna root, amounting to 6% in two hours. With increasing proportions of water, the primary rise in creases and there is a more rapid approach to equilibrium.

TABLE III—THE EFFECT OF GLYCERIN-ALCOHOL MIXTURES ON THE WOOD OF BELLADONNA ROOT

Vol of Glycerin	Vol of Alcohol	Average Width of Strips of Cross Sections (Dry = 100) after Time Intervals in Minutes						
		0	1	3	30	60		120
9	1	100	101	101	102	103		106
4	1	100	100	100	101	103		105
3	2	100	99	99	101	103		105
1	1	100	97	97	98	99		100
1	3	100	99	98	99	99		102
1	7	100	99	99	99	100		100

As to the effect of alcohol-glycerin mixtures on the swelling of belladonna root it may be said that the swelling in a mixture of these liquids is practically an average of the effects of the liquids themselves when allowance is made for the relative proportions of the two liquids in the mixture.

The Effect of the Fineness of Powder on the Percolator of Belladonna Root—100 Gm portions of belladonna root in Nos 20, 40, 60 and 80 powders were percolated by the U S P process for the fluidextract, 80 cc of reserve percolate being set aside in each case and the further percolate being collected in successive 100-cc portions.

Numerous tests were carried out to determine the amount of menstruum necessary to render powdered belladonna root "evenly and distinctly damp" as specified in the U S P. Naturally this would vary with different samples of drug according to moisture content. For the drug used in this experiment containing about 10% moisture, 90 cc of menstruum seemed right for moistening 100 Gm of drug. Accordingly this amount of menstruum (alcohol 5 vol—water 1 vol) was used for moistening each 100-Gm portion of drug, and the drug macerated for six hours. The drug was then packed in the percolators as uniformly as possible, and, following the U S P directions, macerated for 48 hours. The reserve portions of 80 cc were then collected at the rate of 10 drops per minute, and then four successive 100 cc portions were collected at the rate of 20 drops per minute. Wherever it was neces-

sary to stop the percolation for a few hours, such as over night, the time factor was held constant for each portion of drug

The various fractions of percolate were assayed for total alkaloids and total extractive

TABLE IV—EFFECT OF FINENESS OF POWDER ON PERCOLATION OF BELLADONNA ROOT Gm OF ALKALOID IN VARIOUS PORTIONS OF PERCOLATE

Percolate	No 20 Pwd	No 40 Pwd	No 60 Pwd	No 80 Pwd
80 cc	0 301	0 307	0 305	0 300
100 cc	0 109	0 149	0 160	0 160
100 cc	0 015	0 027	0 016	0 019
100 cc	0 001	0 009	0 003	0 004
100 cc	0 002	0 003	0 002	0 002
Total	0 428	0 495	0 486	0 485

Gm Total Extractive in Various Portions of Percolate

80 cc	6 91	6 73	8 27	7 46
100 cc	6 76	6 70	7 23	7 49
100 cc	3 52	3 88	4 47	4 73
100 cc	1 83	1 95	3 10	2 42
100 cc	0 86	1 05	1 90	0 91
Total	19 88	20 31	24 97	23 01

The results in Table IV indicate that within the limits of No 20 and No 80 powder, the fineness of powder is of minor importance as to its effect on rate of extraction of alkaloids by percolation. In each case the amount of alkaloid beyond the third percolate was comparatively unimportant. The data as to total extractive agree with the previous findings (1) that the yield of total extractive increases as the size of powder decreases down to and including No 60 powder and that with the No 80 powder there is a decrease in yield of total extractive.

No extensive work has previously been done on the relation of the fineness of powder to the extraction of belladonna root. At the present time the British Pharmacopœia uses a No 22 powder and the U S P specifies a No 40 powder.

The Effect of Variation of Solvents on the Percolation of Belladonna Root—100 Gm portions of belladonna root in No 40 powder were percolated by the U S P process for the fluidextract but using various alcohol-water mixtures in two series of percolations. In each case 80 cc of reserve percolate were set aside and the further percolate collected in successive 100-cc portions. The amount of moistening liquid used was 90 cc for each 100 Gm portion of drug.

TABLE V—PERCOLATION OF BELLADONNA ROOT WITH VARIOUS ALCOHOL-WATER MIXTURES (FIRST SERIES)

Gm Alkaloid in Various Fractions of Percolate					
Percolate	Alcohol	Ale 95 Vol— Water 5 Vol	Ale 9 Vol— Water 1 Vol	Ale 7 Vol— Water 1 Vol	Ale 5 Vol— Water 1 Vol
80 cc	0 154	0 159	0 172	0 265	0 296
100 cc	0 095	0 186	0 201	0 122	0 175
100 cc	0 011	0 015	0 014	0 007	0 015
100 cc	0 002	0 002	0 002	0 003	0 001
100 cc	0 001	0 001	0 001	0 001	0 000
Marc	0 122	0 033	0 004	0 005	0 000
Total	0 385	0 396	0 394	0 403	0 487

Gm Total Extractive in Various Fractions of Percolate

80 cc	3 22	3 47	4 31	6 37	7 10
100 cc	1 25	3 31	6 01	6 10	8 46
100 cc	0 65	1 88	3 49	3 79	3 59
100 cc	0 55	1 61	2 36	1 86	1 66
100 cc	0 57	2 10	2 36	1 35	0 92
Total	6 24	12 37	18 53	19 47	21 73

TABLE VI—PERCOLATION OF BELLADONNA ROOT WITH VARIOUS ALCOHOL-WATER MIXTURES

(SECOND SERIES)

Gm Alkaloid in Various Fractions of Percolate

Percolate	Alc 5 Vol — Water 1 Vol	Alc 4 Vol — Water 1 Vol	Alc 7 Vol — Water 3 Vol	Alc. 1 Vol — Water 1 Vol	Alc 1 Vol — Water 2 Vol
80 cc	0 295	0 241	0 303	0 304	0 233
100 cc	0 164	0 182	0 153	0 158	0 186
100 cc	0 006	0 001	0 021	0 040	0 019
100 cc	0 000	0 001	0 001	0 001	0 002
100 cc	0 000	0 000	0 000	0 000	0 001
Total	0 465	0 425	0 478	0 503	0 441

Gm Total Extractive in Various Fractions of Percolate

80 cc	6 59	7 06	9 51	14 20	16 09
100 cc	7 66	8 41	10 99	10 95	12 46
100 cc	3 45	3 47	2 71	2 48	0 81
100 cc	1 63	1 26	1 12	0 33	0 19
100 cc	1 05	0 66	0 61	0 11	0 14
Total	20 38	20 86	24 94	28 07	26 69

The results in the preceding tables indicate that as the alcoholic strength of the menstruum decreases, extraction of alkaloids becomes more rapid and the yield of extractive becomes greater. It is evident that the four highest alcoholic strengths used do not make good menstrua for belladonna root. The next four proportions, *i e*, alcohol 5 vol —water 1 vol, alcohol 4 vol —water 1 vol, alcohol 7 vol —water 3 vol, alcohol 1 vol —water 1 vol, have approximately the same efficiency, resulting in extraction of substantially all of the alkaloid. As far as our present results go the official menstruum for the U S P fluidextract appears to be well chosen. The results of the U S P menstruum (Alcohol 5 vol —Water 1 vol) carried out two different times in the two different series of percolations agree fairly well. This indicates that the two series of percolations are comparable and that no important differences have arisen from differences in conditions such as temperature, degree of packing and time consumed in percolation. The discrepancy in the total alkaloid shown in case of the higher percentages of alcohol has previously been investigated and explained (1).

DISCUSSION OF RESULTS

Water caused an immediate swelling of thin strips of the wood of belladonna root, the swelling curves being of the same type as those observed in case of thin strips of chestnut wood (1). The results of the tests of alcohol-water mixtures on

the wood of belladonna root are fully comparable with the results on chestnut wood on the more aqueous mixtures. With the more highly alcoholic liquids there is less swelling in the case of belladonna wood than in the case of chestnut wood. It would seem that woody tissues may differ more in behavior to alcohol than to water. The effects of mixtures of liquids on the swelling of the wood of belladonna root are in accord with previous conclusions that the effect of a mixture of two liquids is practically an average of the effects of the liquids themselves when allowance is made for the relative proportions. It is noteworthy that glycerin causes considerable swelling of the belladonna wood in two hours (60% as much as caused by water) whereas glycerin causes only a very slight swelling of chestnut wood (5% as much as caused by water). It should be noted that alcohol had exactly the reverse effect, causing no swelling in the case of belladonna wood but giving considerable swelling with chestnut wood (75% as much as caused by water). The opposite behavior of the two liquids with the two kinds of woody tissue is an example of a principle of colloidal chemistry, *i. e.*, that the swelling of gels is a process of highly selective character. Each gel shows an ability to take up a certain particular liquid (3). Further study of the swelling of drugs should lead to a better understanding of the fundamental principles involved and of their significance in the processes of drug extraction.

The results on percolation of belladonna root with alcohol-water mixtures are in general agreement with the work of Farr and Wright (4). A search of the literature shows that alcohol alone has not been favored as a *menstruum* for this drug, the trend having been toward the use of 50% to 85% alcohol.

SUMMARY

A study has been made of the swelling of the wood of belladonna root in binary mixtures of water, alcohol and glycerin. Percolation tests show that within the limits of No. 20 and No. 80 powder, the fineness of powder is of minor importance in the extraction of belladonna root. By a series of percolations of belladonna root, using various alcohol-water mixtures, it was found that mixtures ranging from alcohol 5 vol — water 1 vol to alcohol 1 vol — water 1 vol give the best results.

REFERENCES

- (1) William J. Husa and Louis Magid, *Jour. A. Ph. A.*, 23, 891 (1934).
- (2) Gortner, "Outlines of Biochemistry," John Wiley and Sons Inc., New York, 1929, pages 223, 563.
- (3) Ware, "Chemistry of the Colloidal State," John Wiley and Sons, Inc., New York, 1930, pages 250-252.
- (4) Farr and Wright, *Pharm. J.* 74, 546 (1905).

COMPARATIVE STUDIES ON THE UTILIZATION OF DIFFERENT MAGNESIUM SALTS *

BY J. C. FORBES AND F. P. PITTS

Although considerable work has been done on magnesium metabolism little data are available concerning the relative utilization of the naturally occurring

* Department of Chemistry, Medical College of Virginia, Richmond, Va.

magnesium compounds of foodstuffs as compared with the lactate and citrate and the inorganic magnesium compounds. Contrary to the usual conception certain magnesium salts are apparently well absorbed from the intestinal tract. Hirschfelder and Haury (1) found on an average in man 42.6 per cent of a purgative dose of Epsom salt excreted in the urine in 24 hours. Carswell and Winter (2) fed 8 Gm of magnesium lactate to adult men and found approximately 50 per cent absorbed. Barbour and Winter (3) conclude that dogs absorb magnesium lactate and gluconate far more readily than magnesium oxide.

The purpose of the present investigation was to determine if the magnesium compounds of natural foodstuffs differed in their absorption and utilization from the lactate and chloride, young white rats being used as experimental animals. Calcium and phosphorus balances were carried on at the same time as the magnesium studies and in several cases the effect of marked dietary alkalinity on the utilization of these elements was studied. The calcium, phosphorus and magnesium concentrations of the various diets were kept relatively constant, the calcium concentration being approximately 450 mg, phosphorus 500 mg and magnesium 240 mg per 100 Gm of ration.

Diets—All of the diets with the exception of that used in experiment Number 4 were prepared from the following stock diet:

Yellow corn meal	710 Gm
Meat meal	100 Gm
Dried milk	50 Gm
NaCl	5 Gm
KCl	2.5 Gm
Small amount of iron and trace of KI	

Dicalcium phosphate or calcium inositol hexaphosphate (a commercial preparation known as calphos being used) was added to this stock diet to give an adequate calcium and phosphorus content. Magnesium lactate or chloride was added to supply the magnesium. Wesson oil to the extent of 10 per cent of the diet was added to increase the fat content. In some cases sodium carbonate to the extent of 2 per cent was also added. The diet used in experiment Number 4 was made up as follows, alfalfa and linseed meal supplying most of the magnesium content:

Yellow corn meal	1000 Gm
Meat meal	200 Gm
Alfalfa	200 Gm
Linseed meal	600 Gm
Calcium lactate to give an adequate calcium concentration	

During the experimental period the rats, two per cage, were kept in round metabolism cages beneath which was a wire gauze and glass funnel to collect feces and urine respectively. The separation of urine and feces was as a rule quite complete but a small amount of spattered food was usually present in the urine. The collection of urine and feces was made at weekly intervals. The supporting funnel was always washed down with dilute hydrochloric acid and water so as to dissolve any precipitated salts; the washings being added to the urine. Distilled water was given at will and five drops of cod liver oil fed daily per cage.

Methods of Analysis—Food and feces analyses were carried out by Morris Nelson and Palmer's method (4). Urines were always acidified, when necessary, diluted to a definite volume, and aliquots taken for calcium and phosphorus analysis. Urine magnesium determinations were carried out on the calcium supernatant fluid in exactly the same manner as used for food and feces.

Remarks—Experiment No. 1—Diet contained CaHPO_4 and Mg lactate. Ca:P:Mg ratio was 1:1.066:0.593.

TABLE I — UTILIZATION OF CA, P AND MG BY RATS

Expt No	Cage	Duration Weeks	Av Gain per Week Gm	Average Daily Intake			Average Daily Retention			Per Cent			% Mg Absorbed
				Ca	P	Mg	Ca	P	Mg	Ca	P	Mg	
1	1	6	17	43	46	25	26	22	7 0	60	48	28	39
	2	6	20	45	48	27	31	22	7 6	69	46	28	41
2	1	5	18	43	45	19	29	24	3 5	67	53	18	30
	2	5	13	36	38	16	25	20	3 7	69	53	23	34
	3	5	12	40	48	20	28	21	3 4	61	44	17	31
3	1	6	21	42	45	25	22	19	5 1	52	42	20	30
	2	6	22	45	48	27	26	19	5 9	58	39	22	35
4	1	6	15	55	57	27	21	28	6 2	38	49	23	31
	2	6	14	58	60	28	22	31	6 8	38	50	24	30
5	1	5	25	55	59	31	32	35	5 4	58	59	17	29
	2	5	19	45	48	26	29	18	4 7	64	37	16	30
	3	5	17	46	49	27	29	18	4 7	63	36	16	30

Experiment No 2 — Diet similar to Experiment No 1, except that Ca P Mg ratio was 1 1 055 0 445 Same as in cages 1 and 2, plus 2 per cent Na CO₃

Experiment No 3 — Diet contained CaHPO₄ and MgCl₂, Ca P Mg ratio was 1 1 066 0 595

Experiment No 4 — Alfalfa and linseed meal diet, Ca P Mg ratio was 1 1 036 0 490

Experiment No 5 — Calcium inosite hexaphosphate and Mg lactate diet, Ca P Mg ratio was 1 1 074 0 580 Experiment No 6 — Same as foregoing, plus 2 per cent Na₂CO₃

CONCLUSIONS

It will be seen from Table I, which records the average weekly determinations of calcium, phosphorus and magnesium retention, that,

1 The different magnesium compounds used do not differ materially in either absorption or utilization The variation in average daily retention is apparently not significant, since the greatest and least retentions were obtained with the same magnesium salt, Experiments 1 and 2

2 The magnesium absorption, as measured by the sum of the urinary and retained magnesium, averaged 32 5 per cent of the intake, and varied between the limits of 29 and 41 per cent

3 Carswell and Winter (2) have shown that after oral administration of magnesium lactate one may obtain either high calcium, low magnesium or low calcium, high magnesium retentions Therefore, it is probable that the apparent effect of the naturally occurring magnesium compounds in linseed meal and alfalfa to produce a low calcium, high magnesium retention is not due to any difference of behavior of these compounds from that of the others

4 Addition of sodium carbonate to the diet to the extent of 2 per cent had no unfavorable effect on the utilization of calcium, phosphorus or magnesium

It is a pleasure to acknowledge a research grant from the Valentine Meat Juice Co., Richmond, to cover a part of the expense of this investigation

REFERENCES

- (1) Hirschfelder, A D, and Haury, V G, *J A M A*, 102, 1138 (1934)
- (2) Carswell, H E, and Winter, J E, *J Biol Chem*, 93, 411 (1931)
- (3) Barbour, H G, and Winter, J E, *J Pharm and Exp Therap*, 43, 607 (1931)
- (4) Morris, H B, Nelson, J W, and Palmer L S, *Ind Eng Chem, Analytical Edition*, 3, 164 (1931)

THE ARSENAMIDES COMPOUNDS CONTAINING THE As-N LINKAGE *¹

BY G O DOAK

The reaction between arsenous halides and amines has been investigated by several workers with rather conflicting results. Thus Leeds (1), Landau (2), Schiff (3), Leonard (4), and Schmidt (5) all obtained compounds of the type $3RNH_2 \cdot AsX_3$. The latter three assigned structural formulas to these compounds, regarding them as substituted ammonium halides, $As \equiv (NH_2RX)_3$. On the other hand Anschutz and Weyer (6) obtained compounds of the type $X_2As-NHR$ and $XAs = (NHR)_2$, by using aniline and arsenous chloride and bromide. They could not obtain the compounds obtained by Landau and Schiff and believed these workers had been dealing with impure mixtures. Similarly Michaelis and Luxembourg (7) obtained $Cl_2AsN(C_4H_9)_2$ from diisobutylamine and arsenous chloride. Substituted arsenous halides and amines have also been investigated and yield similar products. Michaelis obtained $Cl(C_6H_5)As-NHC_4H_9$ and $Cl(C_6H_5)AsN(C_4H_9)_2$ from phenyl dichlorarsine and butylamine and dibutylamine (8). With triethylamine Michaelis obtained a product to which he assigned the formula $Cl_2(C_6H_5)As = N(C_2H_5)_3$. With ammonia he obtained the imide $C_6H_5As = NH$. Hugot had previously obtained an amide $As(NH_2)_3$ from arsenous chloride and ammonia which gave the imide $As_2(NH)_3$ on heating (9). Ipatiew, Rasuwajew and Stromski (10) obtained $(C_6H_5)_2AsNH_2$ from diphenyl chlorarsine and ammonia.

From the work described in the present paper the reaction appears to be more complex than the previous work showed, and the conflicting results are due to the failure of the previous workers to isolate all the products of the reaction. Thus in nearly all the reactions studied, two or more products have been obtained or indicated. The reaction between an arsenous halide and an amine takes place according to the following equations

- 1 $AsX_3 + RNH_2 \longrightarrow XAs-NHR \cdot HX$
- 2 $XAs-NHR \cdot HX + RNH_2 \longrightarrow XAsNHR + RNH \cdot HX$
- 3 $AsX_3 + 2RNH_2 \longrightarrow XAs(NHR \cdot HX)_2$
- 4 $XAs(NHR \cdot HX) + 2RNH_2 \longrightarrow XAs(NHR)_2 + 2RNH \cdot HX$
- 5 $AsX_3 + 3RNH_2 \longrightarrow As(NHR \cdot HX)_3$

The course of the reaction is influenced by several different factors, namely the order of mixing, strength of the base and the arsenous halide used. Certain steric effects also seem to influence the course of the reaction. When a *n*-heptane solution of aniline was added to a *n*-heptane solution of arsenous chloride, an 84.75 per cent yield of $As(NHC_6H_5 \cdot HCl)_3$ was obtained, identical with the product obtained by Schmidt. When the order of mixing was reversed, a 33.56 per cent yield was obtained, and $Cl_2AsNHC_6H_5$ was isolated in considerable amounts from the heptane filtrate. Monomethylaniline gave only a 14.32 per cent yield of $As[N(CH_3)C_6H_5 \cdot HCl]_3$ as compared to the 33.56 per cent yield with aniline, while under similar conditions dimethylaniline did not react with arsenous chloride.

* Scientific Section A. P. H. A., Madison meeting, 1933.

¹ From the Laboratory, Edward Kremers University of Wisconsin, Madison, Wis.

In addition to these arsenic compounds there is always a large amount of the ammonium halide formed in the course of the reaction and it is difficult, sometimes impossible, to separate the arsenic compounds

Several types of compounds have definitely been isolated in the various reactions studied. Compounds of the type $XAs(NHR \cdot HX)_2$ and $As(NHR \cdot HX)_3$ are high melting solids, soluble in water, usually with decomposition, and insoluble in organic solvents. They resemble the corresponding ammonium halides in properties, and are best regarded as arsenic substituted ammonium halides. Thus the piperidine compound, $As(NC_6H_{10} \cdot HCl)_3$, which is only slightly decomposed by cold water, precipitates silver chloride and lead chloride with silver nitrate and lead acetate solutions, forming $As(NC_6H_{10} \cdot HCOOCH_3)_3$ and $As(NC_6H_{10} \cdot HNO_3)_3$.

Compounds of the type X_2AsNHR are high-boiling liquids or low melting solids, obtained by distillation of the solvent after removal of the precipitated ammonium halide and the insoluble arsenic compounds. They fume in the air and are decomposed violently by water. Leonard (4) obtained only a 66 per cent yield of $As(NC_6H_{10} \cdot HCl)_3$ using arsenous chloride and piperidine in *n* heptane solution. This low yield was explained by the solubility of this compound in heptane, which is incompatible with the hydrochloride formula he proposed for the compound. He found, however, that ether precipitated the compound from heptane solution. In repeating Leonard's work, the author determined the solubility of $As(NC_6H_{10} \cdot HCl)_3$ in heptane and found it to be 4×10^{-6} Gm per cc at 25°. The low yield obtained by Leonard is due to the formation of other heptane-soluble compounds of the type X_2AsNHR . Unless the ether is anhydrous these compounds are decomposed by the water present into arsenous oxide and piperidine hydrochloride.

NOMENCLATURE OF THE ARSENIC COMPOUNDS

The name "arsenamide" is suggested for compounds containing the As-N linkage. Thus the following compounds, prepared by the author, are named $C_2H_5(I)As \cdot NHC_6H_5$, aniline-ethylhodoarsenamide, $Cl_2AsN(C_2H_5)_2$, diethylamine dichlorarsenamide, $As(NC_6H_{10} \cdot HCl)_3$, piperidine-arsentriamide trihydrochloride, and $ClAs(NH \cdot CH_2 \cdot CH_2 \cdot NH_2 \cdot HCl)_2$, ethylenediamine-chlorarsendiamide dihydrochloride.

EXPERIMENTAL

The arsenous halides and amines were commercial products, purified by distillation. The substituted arsenous halides were prepared by the author. In the majority of the reactions studied anhydrous *n* heptane was used as the solvent. This was prepared from Diggers Pine oil by the method of Kremers (11). Where other solvents were used they were rendered completely anhydrous. The heptane solution of the amine or arsenous halide was placed in a tall form beaker and surrounded with an ice bath. The tall form beaker was found most convenient for removal of the precipitate formed in the course of the reaction. The beaker was equipped with a cork, mechanical stirrer and dropping funnel. In some cases nitrogen gas was passed into the vessel during the course of the reaction, but this was usually found to be unnecessary. The *n* heptane solution of the arsenous halide or amine was then added dropwise and the mixture stirred during the addition and for one hour longer to ensure the completion of the reaction. A heavy white precipitate formed immediately on addition of the solution. At the completion of the reaction the mixture was filtered, using suction. Nitrogen gas was used to protect the product from oxidation. The filter was further protected from moisture by placing PO_5 tubes in the

suction and nitrogen lines. The precipitate was washed several times with the pure solvent transferred to a vacuum desiccator, and the air removed by flushing several times with nitrogen gas, and finally dried for several days at 20 mm pressure. This precipitate consisted of the hydrohalide of the amine used, mixed with any insoluble arsenic compounds. Since these compounds are insoluble in organic solvents, and in most cases are decomposed by water or alcohol their separation from the amine hydrohalide is extremely difficult. In the case of the piperidine compound it can be purified by fractional crystallization from alcohol. In several other cases separation can be effected by vacuum sublimation as described by Schmidt for purifying the aniline compound. In most cases however, no means of separation was found. In these cases the arsenic content was determined by analysis and computed to percentage of arsenous halide converted into arsenamide hydrohalides.

The filtrate from the original reaction contains the compounds of the type X_2AsNHR . The solvent was removed by distilling in an atmosphere of nitrogen at reduced pressure, and the arsenic compounds fractionated at 1-2 mm pressure. These were collected in special receiving bottles filled with nitrogen gas, and analyzed in thin-walled glass bulbs which could be crushed beneath the liquid used for analysis. In spite of these precautions it was difficult to obtain accurate analyses of these extremely unstable liquids.

REACTIONS STUDIED

(1) Arsenous chloride and aniline. A n heptane solution of aniline added to a n heptane solution of arsenous chloride gave an 84.74 per cent yield of aniline arsenotriamide trihydrochloride $As(NH-C_6H_5-Cl)_3$. It is a yellow solid, decomposed by water, insoluble in organic solvents.

Calculated for $As(NH-C_6H_5-Cl)_3$, arsenic 16.28 per cent. Found arsenic 16.36 per cent. This compound is identical with that prepared by Schmidt (5). When the order of mixing was reversed the precipitate consisted largely of aniline hydrochloride. Arsenic analysis on the precipitate showed that there were present 33.56 per cent of the original arsenous halide used, but no means could be found of separating any arsenic compounds from the aniline hydrochloride. The filtrate after removal of the heptane yielded aniline dichlorarsenamide, $Cl-As-NHC_6H_5$, a yellow crystalline solid, m.p. 89°, decomposed violently by water.

Calculated for $Cl-As-NHC_6H_5$, arsenic 31.50, chlorine 29.83. Found arsenic 31.88, chlorine 29.92.

(2) Arsenous chloride and piperidine. A n heptane solution of arsenous chloride added to a n heptane solution of piperidine gave a 20.95 per cent yield of piperidine arsenotriamide trihydrochloride, $As(NC_4H_9-Cl)_3$. The compound was purified by fractional crystallization from absolute alcohol. It crystallized in long needles, m.p. 240-242° and was decomposed by hot water and boiling alcohol. Calculated for $As(NC_4H_9-Cl)_3$, chlorine 24.39. Found chlorine, 23.44. This compound is identical with that prepared by Leonard (4). The filtrate gave a yellow oil, b.p. 98°/1 mm. It fumed in the air and accurate analyses could not be made. It is probably piperidine dichlorarsenamide $Cl-AsNC_4H_9$. The piperidine arsenotriamide trihydrochloride gave piperidine arsenotriamide trinitrate with silver nitrate in theoretical amounts, m.p. 144°.

Calculated for $As(NC_4H_9-HNO_3)_3$, arsenic 14.52. Found 14.89. With lead acetate piperidine arsenotriamide triacetate $As(NC_4H_9-CH_3COOH)_3$, was obtained, m.p. 304°.

(3) Arsenous chloride and diethylamine. A n heptane solution of arsenous chloride added to a n heptane solution of diethylamine gave a precipitate consisting largely of diethylamine hydrochloride. Arsenic analysis on the precipitate showed that there was present 24.30 per cent of the original arsenous halide used. No arsenic compounds could be separated from the diethylamine hydrochloride. The filtrate gave diethylamine dichlorarsenamide $Cl_2-AsN(C_2H_5)_2$, a yellow liquid, b.p. 107°/38 mm, fuming in the air, decomposed violently by water. Calculated for $Cl_2AsN(C_2H_5)_2$, chlorine 32.58. Found 32.35, 32.16.

(4) Arsenous chloride and ethylenediamine. A n heptane solution of arsenous chloride added to a n heptane solution of ethylenediamine gave a white precipitate, ethylenediamine-chlorarsenamide dihydrochloride $ClAs(NH-CH_2-CH_2-NH-Cl)_2$, was obtained by extracting with boiling anhydrous acetone. It was a white solid charring above 225° without melting.

Calculated for $\text{ClAs}(\text{NHCH}_2\text{CHNH}_2\text{HCl})$, arsenic 24.86, chlorine 34.99 Found arsenic 24.20, chlorine 34.09 The heptane filtrate was not examined

(5) Arsenous chloride and methylaniline A *n* heptane solution of arsenous chloride added to a *n* heptane solution of methylaniline gave a precipitate consisting largely of methyl aniline hydrochloride Arsenic analysis on the precipitate showed that there was present 14.32 per cent of the original arsenous chloride used No arsenic compounds could be separated from the methylaniline hydrochloride The filtrate gave methylaniline dichlorarsenamide $\text{Cl}_2\text{AsN}(\text{CH}_3)\text{C}_6\text{H}_5$, b p $116^\circ/3\text{ mm}$, fuming in the air and decomposed by water

Calculated for $\text{Cl}_2\text{AsN}(\text{CH}_3)\text{C}_6\text{H}_5$, chlorine 28.18 Found chlorine 28.29

(6) Arsenous chloride and benzylamine A *n* heptane solution of arsenous chloride added to a *n* heptane solution of benzylamine gave a white precipitate from which benzylamine arsenetriamide trihydrochloride was separated by sublimation at $170\text{--}200^\circ$ and 2-mm pressure It was a white solid, m p 246° (decomposition) decomposed by water and alcohol

Calculated for $\text{As}(\text{NHCH}_2\text{C}_6\text{H}_5\text{HCl})_3$, arsenic 14.91, chlorine 21.19 nitrogen 8.36 Found arsenic 14.84, 14.87, chlorine 21.05, 21.44, nitrogen 8.38, 8.18 The benzylamine compounds were among the first studied and the heptane filtrates were not examined for possible arsenic compounds

(7) Arsenous chloride and dibenzylamine Dibenzylamine arsenetriamide trihydrochloride, $\text{As}[\text{N}(\text{CH}_2\text{C}_6\text{H}_5)_2\text{HCl}]_3$, was prepared in a similar manner from dibenzylamine and arsenous chloride and purified by vacuum sublimation It is a white solid, m p $252\text{--}254^\circ$ (decomposition) and decomposed by water and alcohol

Calculated for $\text{As}[\text{N}(\text{CH}_2\text{C}_6\text{H}_5)_2\text{HCl}]_3$, arsenic 9.69 chlorine 13.78 nitrogen 5.43 Found arsenic 8.23, chlorine 13.56 nitrogen 5.30

(8) Arsenous chloride and tribenzylamine Just as alkyl halides may be added to tertiary amines to form quaternary ammonium salts so arsenous chloride adds to tertiary amines to form arsenamide chlorides Tribenzylamine arsenetriamide trichloride, $\text{As}[\text{N}(\text{CH}_2\text{C}_6\text{H}_5)_3\text{Cl}]_3$, was prepared in a similar manner to the other two benzylamine compounds and was purified by sublimation at $130\text{--}140^\circ$ and 1 mm pressure It is a white solid, m p $209\text{--}211^\circ$ with decomposition

Calculated for $\text{As}[\text{N}(\text{CH}_2\text{C}_6\text{H}_5)_3\text{Cl}]_3$, arsenic 7.19, chlorine, 10.22 nitrogen 4.03 Found arsenic 7.47, chlorine 9.49 nitrogen 3.67

(9) Ethyldichlorarsine and piperidine A *n* heptane solution of ethyldichlorarsine added to a *n* heptane solution of piperidine gave a white precipitate consisting partially of piperidine hydrochloride By vacuum sublimation at $95\text{--}105^\circ$ and 1 mm pressure, piperidine ethyl arsendiamide dihydrochloride was separated from the piperidine hydrochloride It is a white solid, m p 196° , decomposed by water

Calculated for $\text{C}_2\text{H}_5\text{As}(\text{NC}_4\text{H}_9\text{HCl})$, arsenic 21.7, chlorine 21.0 Found arsenic 21.22 chlorine 20.5 The heptane filtrate gave piperidine ethyldichlorarsenamide $\text{C}_2\text{H}_5\text{As}(\text{Cl})\text{NC}_4\text{H}_9$ It is a yellow liquid, b p $108^\circ/8\text{ mm}$ It reacts violently with water to give ethyl arsenoxide and piperidine hydrochloride

Calculated for $\text{C}_2\text{H}_5\text{As}(\text{Cl})\text{NC}_4\text{H}_9$, arsenic 33.52, chlorine 15.87 Found arsenic 33.30 chlorine 15.88

(10) Ethyldiiodoarsine and aniline A *n* heptane solution of ethyldiiodoarsine added to a *n* heptane solution of aniline gave a white precipitate consisting largely of aniline hydroiodide Arsenic analysis on the precipitate showed that there were present 12.92 per cent of the original ethyldiiodoarsine used No arsenic compounds could be separated from the aniline hydroiodide The filtrate gave aniline ethyldiiodoarsenamide $\text{C}_2\text{H}_5(\text{I})\text{AsNHC}_6\text{H}_5$ as a light yellow oil b p $110^\circ/10\text{ mm}$ which crystallized to a yellow solid on standing It fumed in the air and reacted violently with water Calculated for $\text{C}_2\text{H}_5(\text{I})\text{AsNH}_2\text{C}_6\text{H}_5$, arsenic 23.93 iodine 39.30 Found arsenic 23.84, 23.69, iodine 39.62

(11) Dimethylchlorarsine and piperidine A *n* heptane solution of dimethylchlorarsine added to a *n* heptane solution of piperidine gave a white precipitate consisting almost entirely of piperidine hydrochloride The heptane filtrate gave piperidine dimethylarsenamide $(\text{CH}_3)_2\text{AsNC}_4\text{H}_9$ It is a colorless liquid, b p $75^\circ/8\text{ mm}$ This compound is considerably more stable toward moisture than the corresponding halogen arsenamides

Calculated for $(\text{CH}_3)_2\text{AsNC}_4\text{H}_9$, arsenic 39.64 Found arsenic 39.44 39.50

REFERENCES

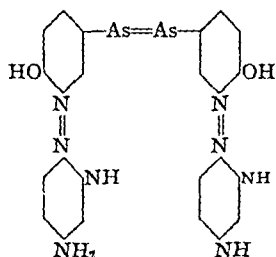
- (1) Leeds, *J A C S*, 3, 134 (1881)
- (2) Landau *Diss* Berlin 1888, *Centr*, 59 1354 (1888)
- (3) Schiff, *Compt Rend* 56 1095 (1863)
- (4) Leonard, *J A C S* 43, 2618 (1921) (5) Schmidt *Ibid*, 43 2449 (1921)
- (6) Anschutz and Weyer *Ann* 261 279 (1890)
- (7) Michaelis and Luxembourg *Ber* 29 710 (1896)
- (8) Michaelis, *Ann*, 320 271 (1902) (9) Hugot *Compt Rend* 139, 54 (1904)
- (10) Ipatiew, Rasuwajew and Stromski *Ber* 62 598 (1929)
- (11) Kremers, *Jour A Ph A* 9, 860 (1920)

THE PREPARATION AND PROPERTIES OF 3,3'-BIS(AZOMETA-PHENYLENEDIAMINE)-4,4'-DIHYDROXYARSENOBENZENE AND 3,3'-BIS(AZO-2,6-DIAMINOPYRIDINE) 4,4'-DIHYDROXYARSENOBENZENE *

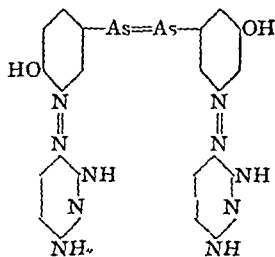
BY A E JURIST AND W G CHRISTIANSEN ¹

It is well known that certain azo dyes penetrate tissue very readily, thereby being disseminated widely throughout the body. Further, some azo dyes, such as trypan blue and trypan red, are absorbed by trypanosomes and have a definite trypanocidal action. Consequently it was decided to prepare some azo dyes from arspnenamine base by diazotizing the latter and coupling with diamines. A number of arsono and arsono azo compounds have been described by Andreyev (1), Karrer (2), Barrowcliff, Pyman and Remfry (3), Benda (4), Jacobs and Heidelberger (5), and Ehrlich and Berthelm (6). Also some patents have been issued covering such compounds. However, none of them are of the type which we prepared by diazotizing arspnenamine and coupling with metaphenylenediamine and with 2,6-diaminopyridine.

The two substances prepared in this investigation were 3,3'-bis(azometa-phenylenediamine)-4,4'-dihydroxyarsenobenzene (I) and 3,3'-bis(azo-2,6-diaminopyridine)4,4'-dihydroxyarsenobenzene (II).



(I)



(II)

When aqueous sodium hydroxide solutions of these compounds were injected intravenously into albino rats, the anticipated tissue staining characteristics resulted. Thus, within a short time after injection the conjunctiva, ears and abdominal cavities of the animals were stained. However, both of these compounds

* Scientific Section, A Ph A Washington meeting 1934

¹ Research Department of the Chemical and Pharmaceutical Laboratories E R Squibb and Sons, Brooklyn, N Y

were very toxic when compared to other arspenamines. The sodium salt of 3,3'-bis(azo-2,6-diaminopyridine)-4,4'-dihydroxyarsenobenzene was found to be bacteriostatic to both *B Typhoid* and *B Staphylococcus* in concentrations of 1-20,000. Further, although the free base was only slightly soluble in water, a saturated, aqueous solution was bacteriostatic to both *B Typhoid* and *B Staphylococcus*. However, both compounds appear to be too toxic for therapeutic use.

EXPERIMENTAL

3,3'-Bis(Azometa-phenylenediamino) 4 4' Dihydroxyarsenobenzene—A solution of 8.8 Gm of arspenamine in 880 cc of water was cooled in ice and 3.5 cc of concentrated hydrochloric acid was added. This was then diazotized by adding 3.0 Gm of sodium nitrite dissolved in 10 cc of water. After stirring for 1/2 hour, 4.3 Gm of metaphenylenediamine dissolved in an excess of dilute hydrochloric acid was added. After stirring for one hour a slight excess of sodium bicarbonate was added. A finely divided red brown precipitate formed which was separated by centrifuging. It was resuspended in water, collected on a Buchner funnel and washed with water.

Assay As found, 28.11%, calculated for $C_{12}H_{10}O_2N_8As$ 24.83%

The dark brown solid was soluble in concentrated aqueous hydrochloric acid and aqueous sodium hydroxide, giving a deeply colored solution. It was also slightly soluble in water, ethyl alcohol, methyl alcohol, acetone and ether. 0.2 Gm dissolved completely in 20 cc of water and 1.5 cc of normal sodium hydroxide.

Intravenous injections were made in rats using a solution of 0.5 Gm of compound in 5 cc of normal sodium hydroxide and 45 cc of water. A dose of 100 mg/Kg was lethal and stained the conjunctiva, ears and abdominal cavity a pale yellow color. Also a blue-greenish color of the skin of the back and shoulders was noted immediately after injection which disappeared in 30 minutes. Owing to the toxicity of this compound it was not further tested.

3,3'-Bis(Azo 2,6-diaminopyridine)-4,4'-Dihydroxyarsenobenzene—A solution of 5 Gm of arspenamine base in 250 cc of water and 9 cc of concentrated hydrochloric acid was cooled to 0° C by the addition of ice and diazotized by adding 3.0 Gm of sodium nitrite dissolved in 20 cc of water. Then 3.0 Gm of 2,6-diaminopyridine dissolved in 12 cc of hydrochloric acid and 60 cc of water was added. The mixture was stirred for 1/4 of an hour and then neutralized with sodium bicarbonate. The precipitate so obtained was collected on a Buchner funnel and washed with water. The brown solid was insoluble in water, slightly soluble in dilute hydrochloric acid and readily soluble in aqueous alkali.

Assay Found, As 24.79%, N 22.94%, calculated for $C_{12}H_{10}O_2N_{10}As$, As 24.74% N 23.10%

This compound was tested for toxicity by intravenous injection. The solution was prepared by dissolving 1.0 Gm in 4 cc of normal sodium hydroxide solution and sufficient water to make solutions of 0.5% to 3.0% concentration. The results of these tests are given in the following table.

These results show that this compound is extremely toxic when injected intravenously since no rats survived even at doses of 5 mg/Kg. This compares unfavorably with a tolerated dose of 200 mg/Kg for arspenamine.

The oral toxicity was found to be between 24 and 52 mg/Kg of body weight.

This compound was also subjected to germicidal and bacteriostatic tests on *B Typhoid* and *B Staphylococcus*. The results of these tests are given in Table II.

TABLE I

Dosage Mg /Kg	Concentration of Solution Used Per Cent	Number of Rats Injected	Number of Rats Died	Survival Time
5	0.5	2	2	4 to 21 hours
10	0.5	2	2	½ to 3 hours
10	1.0	2	2	2 to 6 hours
20	1.0	3	3	2 to 6 hours
40	1.0	3	3	2 to 5 hours
50	2.0	1	1	14 minutes
100	2.0	1	1	6 minutes
200	3.0	1	1	2 minutes
277	3.0	1	1	30 seconds

TABLE II

Germicidal Tests Concentration	Result	Bacteriostatic Tests Concentration	Result
Alkaline solution 1-100	Inactive	Alkaline solution 1- 1 000	Active
Alkaline solution 1-500	Inactive	Alkaline solution 1- 5,000	Active
Alkaline solution 1-1000	Inactive	Alkaline solution 1-10,000	Active
Saturated aqueous solution	Inactive	Alkaline solution 1-20 000	Active
		Alkaline solution 1-50 000	Inactive
		Saturated aqueous solution	Active

NOTE These results apply equally to *B. Typhoid* and *B. Staphylococcus*

SUMMARY

1 Two azo derivatives of arsphenamine were prepared by coupling diazotized arsphenamine with metaphenylenediamine and 2,6-diaminopyridine, respectively

2 These two substances were found to penetrate the tissue of test animals very rapidly, but were too toxic for therapeutic purposes

3 One of these compounds, 3,3'-bis(azo-2,6-diaminopyridine)-4,4'-dihydroxy-arsenobenzene was found to be bacteriostatic but not germicidal to *B. Typhoid* and *B. Staphylococcus*

The biological tests on compounds reported herein were made in the Biological Research Laboratories of E. R. Squibb and Sons and we gratefully acknowledge their assistance

REFERENCES

- (1) Andreyev, *J. Russ. Phys.-Chem. Soc.* 45 1980 (1913)
- (2) Karrer, *Ber.*, 45, 2359 (1912)
- (3) Barrowcliff, Pyman and Remfry, *J. Chem. Soc.* 93 1893 (1908)
- (4) Benda, *Ber.*, 44 3579 (1911)
- (5) Jacobs and Heidelberger, *J. Am. Chem. Soc.* 43, 1632, 1646 (1921)
- (6) Ehrlich and Berthelm, *Ber.* 40, 3297 (1907)

Harvard University has created a new Doctor of Philosophy degree in the "History of Science and Learning." Dr. Conant in explanation of this degree stated that "the history of science, the history of ideas, the history of scholarship and the history of universities should now be occupying the attention of many instead of a few."

Winners of the degree will be required to have a knowledge of six major fields and to master the technique of historical and scientific investigation. Harvard's Graduate School of Arts and Sciences now offers more than a score of courses in various phases of the history of knowledge.

were very toxic when compared to other arsphenamines. The sodium salt of 3,3'-bis(azo-2,6-diaminopyridine)-4,4'-dihydroxyarsenobenzene was found to be bacteriostatic to both *B. Typhoid* and *B. Staphylococcus* in concentrations of 1-20,000. Further, although the free base was only slightly soluble in water, a saturated aqueous solution was bacteriostatic to both *B. Typhoid* and *B. Staphylococcus*. However, both compounds appear to be too toxic for therapeutic use.

EXPERIMENTAL

3,3'-Bis(Azomela-phenylenediamino)-4,4'-Dihydroxyarsenobenzene—A solution of 8.8 Gm of arsphenamine in 880 cc of water was cooled in ice and 3.5 cc of concentrated hydrochloric acid was added. This was then diazotized by adding 3.0 Gm of sodium nitrite dissolved in 10 cc of water. After stirring for 1/2 hour 4.3 Gm of metaphenylenediamine dissolved in an excess of dilute hydrochloric acid was added. After stirring for one hour a slight excess of sodium bicarbonate was added. A finely divided red brown precipitate formed which was separated by centrifuging. It was resuspended in water, collected on a Buchner funnel and washed with water.

Assay As found, 28.11%, calculated for $C_{14}H_{10}O_2N_8As$, 24.83%

The dark brown solid was soluble in concentrated aqueous hydrochloric acid and aqueous sodium hydroxide, giving a deeply colored solution. It was also slightly soluble in water, ethyl alcohol, methyl alcohol, acetone and ether. 0.2 Gm dissolved completely in 20 cc of water and 1.5 cc of normal sodium hydroxide.

Intravenous injections were made in rats using a solution of 0.5 Gm of compound in 5 cc of normal sodium hydroxide and 45 cc of water. A dose of 100 mg/Kg was lethal and stained the conjunctiva, ears and abdominal cavity a pale yellow color. Also a blue-greenish color of the skin of the back and shoulders was noted immediately after injection which disappeared in 30 minutes. Owing to the toxicity of this compound it was not further tested.

3,3'-Bis(Azo-2,6-diaminopyridine)-4,4'-Dihydroxyarsenobenzene—A solution of 5 Gm of arsphenamine base in 250 cc of water and 9 cc of concentrated hydrochloric acid was cooled to 0° C by the addition of ice and diazotized by adding 3.0 Gm of sodium nitrite dissolved in 20 cc of water. Then 3.0 Gm of 2,6-diaminopyridine dissolved in 12 cc of hydrochloric acid and 60 cc of water was added. The mixture was stirred for 3/4 of an hour and then neutralized with sodium bicarbonate. The precipitate so obtained was collected on a Buchner funnel and washed with water. The brown solid was insoluble in water, slightly soluble in dilute hydrochloric acid and readily soluble in aqueous alkali.

Assay Found, As 24.79%, N 22.94%, calculated for $C_{22}H_{10}O_2N_{10}As$ As 24.74% N 23.10%

This compound was tested for toxicity by intravenous injection. The solution was prepared by dissolving 1.0 Gm in 4 cc of normal sodium hydroxide solution and sufficient water to make solutions of 0.5% to 3.0% concentration. The results of these tests are given in the following table.

These results show that this compound is extremely toxic when injected intravenously since no rats survived even at doses of 5 mg/Kg. This compares unfavorably with a tolerated dose of 200 mg/Kg for arsphenamine.

The oral toxicity was found to be between 24 and 52 mg/Kg of body weight.

This compound was also subjected to germicidal and bacteriostatic tests on *B. Typhoid* and *B. Staphylococcus*. The results of these tests are given in Table II.

TABLE I

Dosage Mg /Kg	Concentration of Solution Used Per Cent	Number of Rats Injected	Number of Rats Died	Survival Time
5	0.5	2	2	4 to 21 hours
10	0.5	2	2	½ to 3 hours
10	1.0	2	2	2 to 6 hours
20	1.0	3	3	2 to 6 hours
40	1.0	3	3	2 to 5 hours
50	2.0	1	1	14 minutes
100	2.0	1	1	6 minutes
200	3.0	1	1	2 minutes
277	3.0	1	1	30 seconds

TABLE II

Germicidal Tests Concentration	Result	Bacteriostatic Tests Concentration	Result
Alkaline solution 1-100	Inactive	Alkaline solution 1- 1,000	Active
Alkaline solution 1-500	Inactive	Alkaline solution 1- 5,000	Active
Alkaline solution 1-1000	Inactive	Alkaline solution 1-10 000	Active
Saturated aqueous solution	Inactive	Alkaline solution 1-20,000	Active
		Alkaline solution 1-50 000	Inactive
		Saturated aqueous solution	Active

NOTE These results apply equally to *B. Typhoid* and *B. Staphylococcus*

SUMMARY

1 Two azo derivatives of arspenamine were prepared by coupling diazotized arspenamine with metaphenylenediamine and 2,6-diaminopyridine, respectively

2 These two substances were found to penetrate the tissue of test animals very rapidly, but were too toxic for therapeutic purposes

3 One of these compounds, 3,3'-bis(azo-2,6-diaminopyridine)-4,4'-dihydroxy-arsenobenzene was found to be bacteriostatic but not germicidal to *B. Typhoid* and *B. Staphylococcus*

The biological tests on compounds reported herein were made in the Biological Research Laboratories of E. R. Squibb and Sons and we gratefully acknowledge their assistance

REFERENCES

- (1) Andreyev *J. Russ. Phys.-Chem. Soc.* 45 1980 (1913)
- (2) Karrer, *Ber.* 45 2359 (1912)
- (3) Barrowcliff, Pyman and Remfry *J. Chem. Soc.*, 93 1893 (1908)
- (4) Benda *Ber.* 44, 3579 (1911)
- (5) Jacobs and Heidelberg, *J. Am. Chem. Soc.*, 43, 1632, 1646 (1921)
- (6) Ehrlich and Berthelm, *Ber.*, 40 3297 (1907)

Harvard University has created a new Doctor of Philosophy degree in the "History of Science and Learning." Dr. Conant in explanation of this degree stated that "the history of science, the history of ideas, the history of scholarship and the history of universities should now be occupying the attention of many instead of a few."

Winners of the degree will be required to have a knowledge of six major fields and to master the technique of historical and scientific investigation. Harvard's Graduate School of Arts and Sciences now offers more than a score of courses in various phases of the history of knowledge.

THE EFFECT OF ALTITUDE ON THE ACTION OF DRUGS I STRYCHNINE *

BY A. W. MOORE AND JUSTUS C. WARD ¹

Medical and veterinary practice has long known that differences in altitude have made necessary the modification of doses in the use of many potent drugs. The purpose of these investigations is to make quantitative studies of the variation in lethal doses as well as of the speed of action of the drugs involved when all variables, except altitude, are held as constant as possible. Strychnine, as the sulphate, is the drug studied in the present communication.

Two distinct experiments were conducted. In the first series tame rats were used, in the second series, Columbian ground squirrels. One hundred tame rats

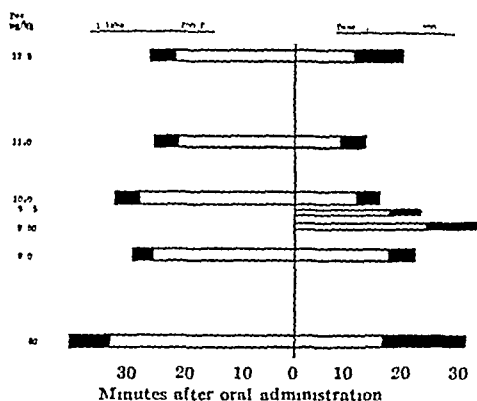


Fig. 1—Reaction time of rats to strychnine, periods until symptoms, duration of convulsions, and death

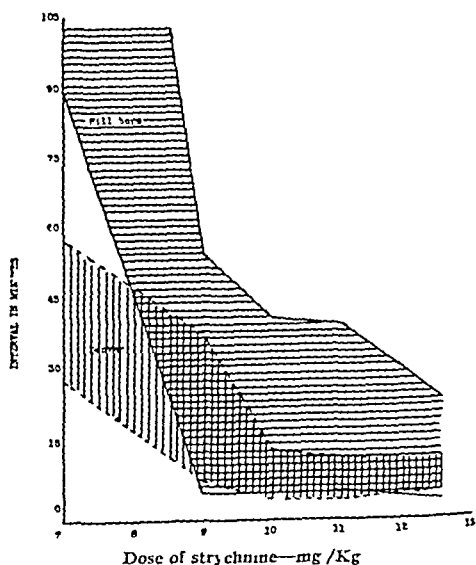


Fig. 2—Interval between administration and tetany or death, zone indicates duration of convulsions

of uniform size, 8 to 10 weeks old, were purchased from a Denver, Colo., breeder who raises large and healthy stock. Half of these were forwarded to Hillsboro, Ore., and the others retained at Denver. Feed for both groups was purchased at Denver and divided so the ration was identical at both stations. The animals were held for 3 months to insure complete acclimatization.

Just a few days before the tests were to be conducted, the poison solution to be used was prepared at Denver and also divided. Half of it was carefully sealed and sent to Hillsboro, and the other half retained at Denver. The same technique of administering the poison orally was employed at both elevations.

On the day of the tests, the room temperature, barometric pressure, relative humidity, and character of the weather were all recorded. There was fortunately

* Scientific Section, A. P. H. A., Madison meeting, 1933

¹ Bureau of Biological Survey, Hillsboro, Ore., and Denver, Colo.

a gratifying check of conditions, so the difference in barometric pressure due to the variation in altitude was the principal factor to explain the observed changes in rate and degree of strychnine action

Table I gives the climatological comparisons at the two stations during the period of the tests

The poison used in this test was strychnine as sulphate in a concentration of $2\frac{1}{2}$ mg /cc in distilled water

Table II gives the detailed experimental results of the altitude experiments with tame rats Fig 1 shows the same data graphically

In Table III the correlations were made on the basis of the probable errors (PE) of the averages and are so listed It appears from Tables II and III that the LD₁₀₀ per cent (lethal dose for 100 per cent of the animals tested) was 12.50 mg /Kg at Hillsboro and 10.00 mg /Kg at Denver Also 10/10 animals at Hillsboro died in 25 minutes after 4.1 minutes of intermittent tetany while at Denver the figures were 15.0 and 4.0 minutes respectively

TABLE I

	Hillsboro Oregon	Denver Colorado
Altitude	200 feet	5280 feet
Barometric pressure	757 765 768, 760 mm	625 mm
Temperature	20° C 21.1° C	22.2° C
Relative humidity	44%, 67% 56%, 87%	12%

TABLE II

Dose Mg /Kg	Ratio	Hillsboro Oregon			Ratio	Denver Colorado		
		*T/S Minutes	*T/T Minutes	♢T,D Minutes		T/S Minutes	T/T Minutes	T/D Minutes
12.50	10/10	21.1	4.1	25.2	6/6	10.2	8.8	19.0
11.00	6/10	20.7	4.0	24.7	6/6	8.3	4.0	12.3
10.00	6/8	27.2	4.1	31.3	6/6	11.0	4.0	15.0
9.75					3/6	15.3	6.7	22.0
9.50					4/6	23.0	9.0	32.0
9.00	5/10	16.4	3.4	28.6	3/6	25.2	4.3	20.7
7.50	1/10	33.0	7.0	40.0	3/6	15.3	14.7	30.0

* Time to onset of spasm * Period of intermittent tetany ♢ Time to death

TABLE III — STATISTICAL CORRELATIONS

Dose Mg /Kg	T/T		T/D	
	Hillsboro	Denver	Hillsboro	Denver
12.50	4.1 ± 2.49	5.6 ± 2.30	25.2 ± 11.18	12.8 ± 2.58
11.00	4.0 ± 1.41	4.0 ± 3.10	24.7 ± 9.15	12.3 ± 5.25
10.00	4.1 ± 2.39	4.0 ± 1.69	31.3 ± 5.08	15.0 ± 5.08
9.00	3.4 ± 1.42	4.3 ± 1.89	28.6 ± 5.15	20.7 ± 1.50
7.50		14.7 ± 6.40		30.0 ± 8.45

In Table IV an attempt was made to evaluate the survivals in relation to the effectiveness of the dose The averages for each dose were divided by the unit percentage of the animals that died in the series represented by the average involved For example at Hillsboro 100 per cent of the animals given 12.50 mg /Kg died in 25.2 minutes, accordingly $25.2/1.00 = 25.2$ However, at 9.00 mg /Kg only 50 per cent of the animals died in 28.6 minutes, and $28.6/0.5 = 57.2$ Thus then becomes the new average, when the survivals have been evaluated in this way Fig 2 shows graphically how well this system of correlation actually causes the data obtained to approach the ideal curves In the case of the 'time to death' T/D lines at Hillsboro the curve approaches a straight line at 12.50 and again at 7.50 mg /Kg, indicating all animals would die at 12.50 or above and all animals would live below 7.50 Between those figures the curve approaches the ideal configuration At Denver, however the experiment is not sufficiently complete at the lower doses to draw such definite conclusions It does, however, show that above 10.00 mg /Kg a

straight line is approached, and that below 7.50 the tendency would be a sharp break upward indicating a high percentage of survivals.

To determine whether the averages included in the above tables were significant, the PE of the differences between them were computed. Table V gives these data for the doses 9.00-12.50 mg/Kg. These figures were obtained from the averages of the animals that actually died, and consequently do not show the range that would have been indicated had the evaluated survivals been included. The table shows no significance for any of the figures on the period of intermittent tetany (T/T), but it does show PE of 2.9-5.56 for the T/D figures. From tables of probabilities (1) these figures mean that the chances of recurrence range from 1 in 20 to 1 in 5000. These ranges are not highly significant, but do indicate a definite effect from altitude differences on strychnine susceptibility.

Similar studies on Columbian ground squirrels were undertaken with much less detail in the field by the senior author.

The original plan was to conduct dosage trials so as to have the plant development stage similar at all elevations. This was done at the first two points studied,

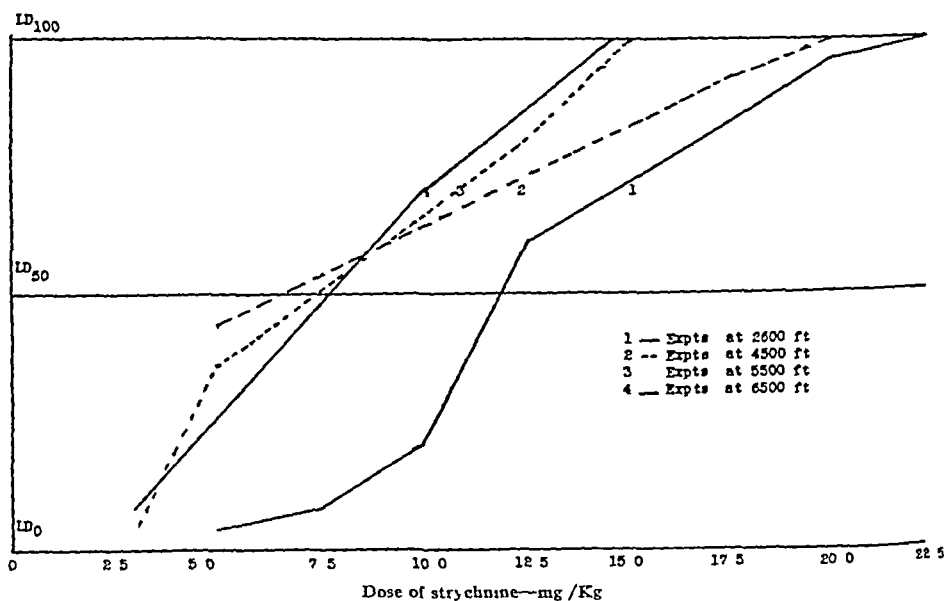


Fig 3—Toxicity of strychnine orally to Columbian ground squirrels

but the third and fourth locations were reached when plant growth was approximately a week younger than that at the first two.

Elevations used were obtained from Geological Survey maps, and are accurate to 100 feet.

Table VI shows a gradual decline in the LD_{100} per cent as elevation increases. Fig 3 gives the data graphically. The animals used were obtained from areas where no trapping and poisoning had previously been done.

Table VI reveals two points of major interest.

(1) The LD_{100} per cent varies inversely with the altitude. Plotting LD_{100} per cent against altitude an equation can be developed $y = 14,300 - 520x$ (where y is the LD and x the altitude). This equation suggests a decrease in LD_{100} of about 2.0 mg/Kg for each 1000 ft increase in elevation, when Columbian ground squirrels are poisoned with strychnine. The LD_{50} per cent doses show a similar relationship.

(2) The T/D varies directly with the altitude. This conclusion is reached, however, from correlations in which average times for entire series were taken, and exactly comparable doses are not available.

TABLE IV—AVERAGES WITH SURVIVAL EVALUATIONS INCLUDED

Dose Mg /Kg	T/T		T/D	
	Hillsboro	Denver	Hillsboro	Denver
12 50	4 1	5 6	25 2	12 8
11 00	6 7	4 0	41 2	12 3
10 00	5 5	4 0	42 6	15 6
9 00	6 8	8 6	57 2	41 4
7 50	70 0	29 4	400 0	60 0

TABLE V—SIGNIFICANCE CORRELATIONS

Dose	T/T		T/D		Probable Errors of the Differences T/D	Probability of Recurrence
	Hillsboro	Denver	Hillsboro	Denver		
12 50 mg /Kg						
Average time	4 1	5 6	25 2	12 8		
PE _{mean}	0 79	1 03	3 54	1 15	3 33	1 40
11 00 mg /Kg						
Average time	4 0	4 0	24 7	12 3		
PE _{mean}	0 57	1 27	3 72	2 14	2 88	1 20
10 00 mg /Kg						
Average time	4 1	4 0	31 3	15 0		
PE _{mean}	0 97	0 69	2 06	2 08	5 56	1 5000
9 00 mg /Kg						
Average time	3 4	4 3	28 6	20 7		
PE _{mean}	0 63	1 09	2 30	0 87	3 21	1 35

TABLE VI—EXPERIMENTAL RESULTS—STRYCHNINE ALTITUDE STUDIES COLUMBIAN GROUND SQUIRRELS—ORAL ADMINISTRATION

Altitude	Doses Mg /Kg	Ratio	Average	
			T/T Minutes	T/D Minutes
2600 ft	5 0	1/26		
	7 5	1/12		
	10 0	2/10		
	12 5	6/10		
	20 0	24/25		
	22 5	25/25	7 0	21 0
4500 ft	5 0	11/25		
	17 5	23/25		
	20 0	25/25	11 5	35 0
5500 ft	3 0	1/25		
	5 0	9/25		
	12 5	20/25		
	15 0	25/25	8 5	34 5
6500 ft	3 0	2/25		
	10 0	7/10		
	12 5	22/25		
	15 0	25/25	17 8	44 4

CONCLUSIONS

(1) A change in elevation of 5000 feet caused a 20 per cent reduction in LD₁₀₀ per cent and a 40 per cent decrease in the T/D (time to death), following oral administration of strychnine as the sulphate to tame rats.

(2) Statistical analysis shows the effects observed are not highly significant, ranging from 1-20 to 1-5000

(3) Inclusion of survivals, by a percentage system of evaluation, causes the curves to approach the ideal

(4) Successive increases of elevation of 1000 feet produced a definite and fairly constant reduction in LD₁₀₀ per cent of strychnine administered orally to Columbian ground squirrels

(5) Ground squirrels appeared to be more susceptible than rats to changes in elevation

ACKNOWLEDGMENT

Much credit is due A D Stephenson, a junior in grazing studies at the University of Montana for without his assistance which he gave whole heartedly in the form of many 16 hour days, it would have been impossible to complete the studies on the Columbian ground squirrels as outlined Our appreciation is also due Dr James C Munch for his courteous assistance in checking the data presented, with particular reference to the statistical interpretations

REFERENCE

- (1) Munch James C, 'Application of Statistical Methods to Pharmaceutical Research I Measures of Accuracy,' JOUR A PH A, 20, 126 (1931)



PORTLAND'S A P H A CONVENTION COMMITTEE

Members of committee in charge of arrangements for convention in Portland scheduled for August 5-10 1935 Seated Left, A O Mickelsen Local Secretary, Mrs Ralph A Watson, in Charge of Women's Activities, and L G Haack, General Chairman Standing Left to Right E A Stipe, Transportation, Earl Gunther, Scientific Display, F C Felter, Publicity, Peyton Hawes Entertainment, Fred Geue, Treasurer, Frank Nau, Vice Chairman, and Frederick Grill, Secretary, Local Committee Dean A O Zieffe, Chairman, Reception Committee, not present when picture was taken

THE PRESERVATION OF HALIBUT LIVER OIL WITH HYDROQUINONE *¹

BY W S JONES AND W G CHRISTIANSEN

It has been shown (1), (2) that the absorption of oxygen by cod liver oil is greatly retarded by the presence of an antioxidant, thus preventing loss of Vitamin A and development of mal-flavors in especially prepared oils. H N Brocklesby and O F Denstedt (3) have recently shown that the rate of absorption of oxygen by pilchard oil can also be decreased greatly by the addition of an antioxidant such as hydroquinone or pyrogallol.

Halibut Liver Oil is not only a very potent and highly concentrated source of Vitamin A, but also an oil which requires special refining in order to free it from natural objectionable odor and taste, hence an oil in which such protection should be of utmost importance. Therefore a study was made to determine the degree of protection afforded by an antioxidant such as hydroquinone in preventing vitamin and other deterioration. The present work shows that when halibut liver oil is exposed to both air and oxygen, the absorption of oxygen² and the loss of Vitamin A³ is greatly retarded by the presence of hydroquinone.

EXPERIMENTAL

A Type of Oils Studied—Two samples (A and B) of refined halibut liver oil differing slightly in Vitamin A potency were used, into a portion of each of these oils was incorporated 0.03% hydroquinone.

B Preparation of Samples—Four 25 Gm portions of each of the four oils were weighed into 100 cc tared beakers. Two weighed portions of each group were allowed to stand exposed to the air in the laboratory (A paper covering was placed over samples to protect them against dust and yet not to exclude free access of air). The remaining two weighed portions of each group were placed in a ten inch vacuum desiccator. By means of inlet and outlet tubes in the cover of the desiccator the air in the desiccator was swept out with oxygen. The inlet and outlet tubes were then closed off by means of pinch clamps.

C Testing of Samples—One sample of each pair was tested weekly by the Vitamin A color test the second of each pair was weighed weekly. In case of samples exposed to oxygen the space in the desiccator was reflooded with oxygen and sealed from the air after each weekly observation.

D Vitamin A Color Unit—As a relative index of the Vitamin A potency of the oils our laboratories have adopted a color standard (developed by the Biological Laboratories of E R Squibb and Sons) prepared as follows:

Five-cc portions of 0.5 M $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ (made up in 1% HCl) are measured out 0.1, 0.3, 0.4, 0.5 and 0.6 cc portions of 0.5 M CoCl_2 in 1% HCl are added respectively to different portions of copper sulphate solution. The mixtures are then diluted with 1% HCl to exactly 10 cc and exactly 2 cc of each solution is transferred to a 1-cm bore test tube and sealed. The cobaltous chloride imparts a red tint to the blue copper sulphate solution and the gradation in red obtained by the addition of increasing amounts of the cobalt solution makes it possible to match accurately the shades of blue produced by different oils. One cm of thickness of this solution approximates six Lovibond blue units.

E Technique of the Antimony Trichloride Vitamin A Color Test—One tenth gram of oil is weighed out and dissolved in chloroform to make a volume of 50 cc. A measured volume of the chloroform solution is diluted with more chloroform so that the addition of 1.8 cc of a saturated

* Section on Practical Pharmacy and Dispensing, Madison meeting 1933.

¹ Research Department of the Chemical and Pharmaceutical Laboratories, E R Squibb and Sons, Brooklyn, N Y.

² Determined by increase in weight of the oil.

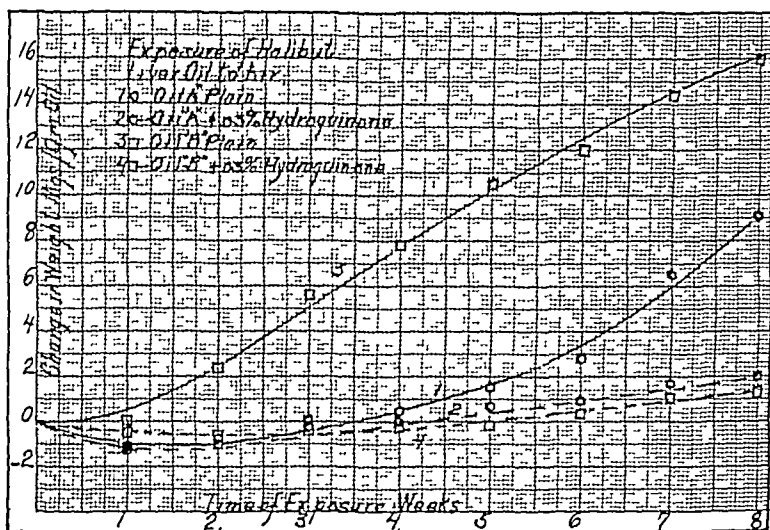
³ Determined by color test and confirmed by biological assay.

chloroform solution of antimony trichloride to 0.2 cc of the chloroform solution of oil in a 1-cm bore test tube produces a blue color which matches one of the copper sulphate standards. The Vitamin A color units per Gm of oil would then be

$$\frac{50 \times A}{\text{Wt of oil} \times 0.2}$$

A is the dilution factor, i.e. the degree to which the 50 cc of CHCl_3 solution must be diluted in order to match the standard blue. Thus if 5 cc is diluted to 20 cc, A will be 4.

F —The results of the successive color tests are recorded in Table I.



Graph 1

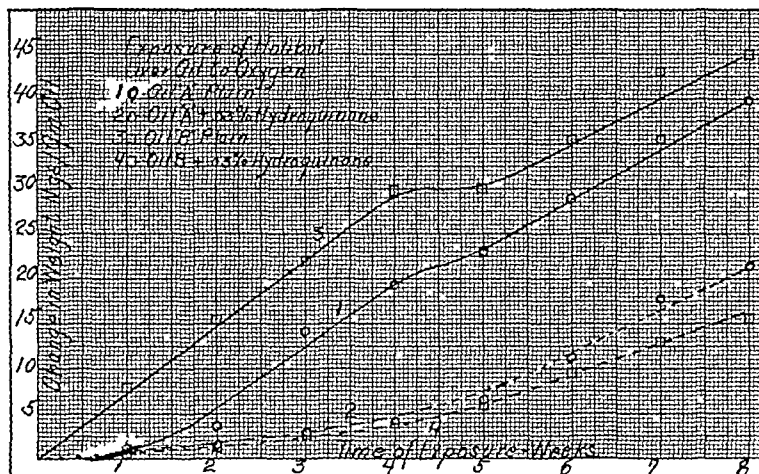
TABLE I

Vitamin A Color Units per Gm

Initial Color Test	Sample No	Condition of Exposure	Antioxidant	First Week	Second Week	Third Week	Fourth Week	Fifth Week	Sixth Week	Seventh Week	Eighth Week
Oil A	1 Air	None		10600	10900	10530	9000	9090	6000	Released for Bio Assay	
	5 Air	Hydroquinone		10700	10800	10070	9250	10300	9500		
11,100 cu /Gm	3 Oxygen	None		10500	7500	*					
	7 Oxygen	Hydroquinone		10700	10400	9000	7500	5450	*		
Oil B	9 Air	None		7250	5200	3000	*				
	13 Air	Hydroquinone		7270	7700	7500	7850	7500	7300	6550	6410
	11 Oxygen	None		3230	*						
	15 Oxygen	Hydroquinone		8700	6820	6900	5680	5600	4500	2700	*

* At this point the color produced by the SbCl_3 has become so violet that it cannot be matched with the standards

It was noted during the course of the work that as the Vitamin A was being destroyed (as indicated by the color test) the color of the oil gradually changed from a light amber to a bright yellow. Further the color produced in the antimony trichloride test differed from the copper sulphate blue (it became reddish purple), so that it could not be matched by any of our standards. The difference was slight in the beginning and became more noticeable as the experiment progressed. This change was very rapid and pronounced in samples without antioxidant and exposed to oxygen, the change becomes slower when an antioxidant is used and the exposure is less severe, i. e., air instead of oxygen.



Graph 2

These color tests show that exposure of halibut liver oil to oxygen as such or as air causes Vitamin A deterioration and that these losses are retarded greatly by the addition of hydroquinone.

G—In order to confirm the results of the color tests, one pair of samples (Oil A without and with hydroquinone—Nos. 1 and 5 in Table I) were assayed biologically after they had been exposed to air for six weeks. The results are contained in Table II and show the pronounced protection afforded by Hydroquinone.

TABLE II

	Vitamin A Potency in U S P Units *
Original Oil	76,750
After 6 weeks exposure to air without hydroquinone	41,500
Protected by addition of 0.03% hydroquinone and exposed to air for 6 weeks	61,250

* Not to be confused with new units (1934 Revised). To convert to 1934 Revised Units use factor 1.4.

H—The change in weight of oils in mg./Gm. of oil due to exposure to air and oxygen are recorded in Table III and the data are plotted in curves on Graphs 1 and 2. Due to the fact that the increases in weight of oils exposed to pure oxygen were so much greater than those of the oils exposed to air the data of the two groups were plotted on separate plates. No explanation can be given at present for the sudden, temporary leveling of Curve 3, Graph 2.

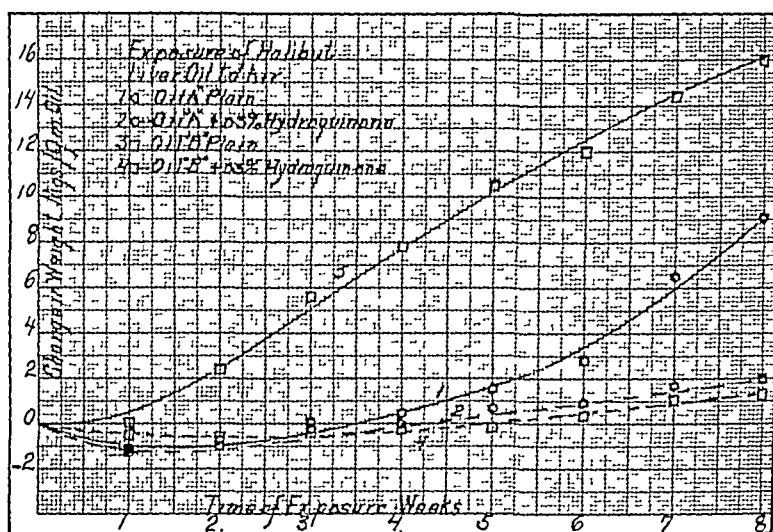
It will be noted from Graphs 1 and 2 that

chloroform solution of antimony trichloride to 0.2 cc of the chloroform solution of oil in a 1-cm bore test tube produces a blue color which matches one of the copper sulphate standards. The Vitamin A color units per Gm of oil would then be

$$\frac{50 \times A}{\text{Wt of oil} \times 0.2}$$

A is the dilution factor, i.e., the degree to which the 50 cc of CHCl_3 solution must be diluted in order to match the standard blue. Thus, if 5 cc is diluted to 20 cc, A will be 4.

F —The results of the successive color tests are recorded in Table I.



Graph 1

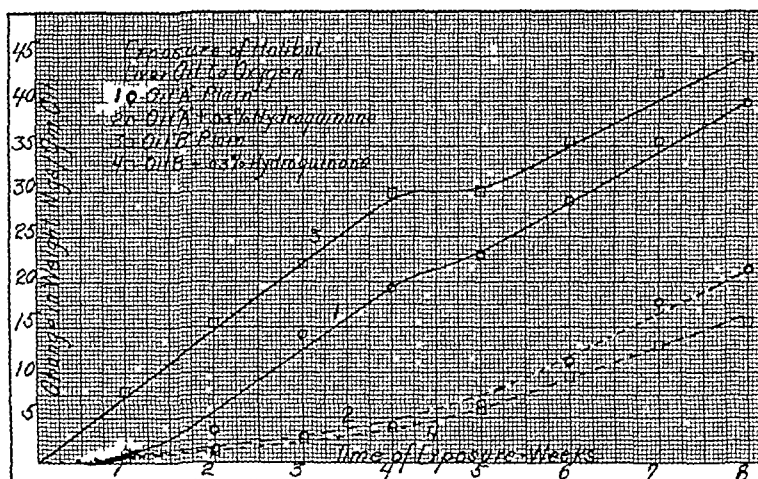
TABLE I

Vitamin A Color Units per Gm

Initial Color Test	Sample No	Condition of Exposure	Antioxidant	First Week	Second Week	Third Week	Fourth Week	Fifth Week	Sixth Week	Seventh Week	Eighth Week
Oil A	1 Air	None		10600	10900	10530	9000	9090	6000	Released for Bio Assay	
	5 Air	Hydroquinone		10700	10800	10070	9250	10300	9500		
11,100 cu /Gm	3 O ₂ gen	None		10500	7500	*					
	7 O ₂ gen	Hydroquinone		10700	10400	9000	7500	5450	*		
Oil B	9 Air	None		7250	5200	3000	*				
	13 Air	Hydroquinone		7270	7700	7500	7850	7500	7300		
	11 O ₂ gen	None		3230	*						
8700 cu /Gm	15 O ₂ gen	Hydroquinone		8700	6820	6900	5680	5600	4500	2700	*

* At this point the color produced by the SbCl_3 has become so violet that it cannot be matched with the standards

It was noted during the course of the work that as the Vitamin A was being destroyed (as indicated by the color test) the color of the oil gradually changed from a light amber to a bright yellow. Further the color produced in the antimony trichloride test differed from the copper sulphate blue (it became reddish purple), so that it could not be matched by any of our standards. The difference was slight in the beginning and became more noticeable as the experiment progressed. This change was very rapid and pronounced in samples without antioxidant and exposed to oxygen, the change becomes slower when an antioxidant is used and the exposure is less severe, i. e., air instead of oxygen.



Graph 2

These color tests show that exposure of halibut liver oil to oxygen as such or as air causes Vitamin A deterioration and that these losses are retarded greatly by the addition of hydroquinone.

G—In order to confirm the results of the color tests, one pair of samples (Oil A without and with hydroquinone—Nos 1 and 5 in Table I) were assayed biologically after they had been exposed to air for six weeks. The results are contained in Table II and show the pronounced protection afforded by Hydroquinone.

TABLE II

	Vitamin A Potency in U S P X Units *
Original Oil	76,750
After 6 weeks' exposure to air without hydroquinone	41,500
Protected by addition of 0.03% hydroquinone and exposed to air for 6 weeks	61,250

* Not to be confused with new units (1934 Revised). To convert to 1934 Revised Units use factor 1.4

H—The change in weight of oils in mg./Gm. of oil due to exposure to air and oxygen, are recorded in Table III and the data are plotted in curves on Graphs 1 and 2. Due to the fact that the increases in weight of oils exposed to pure oxygen were so much greater than those of the oils exposed to air the data of the two groups were plotted on separate plates. No explanation can be given at present for the sudden, temporary leveling of Curve 3. Graph 2.

It will be noted from Graphs 1 and 2 that

- (a) Oils A and B without hydroquinone (Curves 1 and 3) differ in susceptibility to oxidation, this is particularly noticeable in the "air" experiment (Graph 1)
- (b) Oils A and B with hydroquinone (Curves 2 and 4) do not differ appreciably in susceptibility to oxidation
- (c) An oil containing 0.03% hydroquinone is quite resistant to oxidation as compared with unpreserved oil

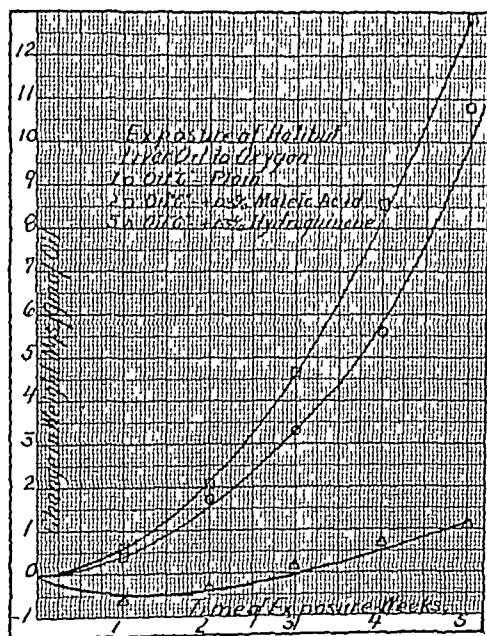
TABLE III

Sample No	Exposed to	Antioxidant	First Week	Second Week	Change in Weight—(Mg per Gm of Oil)	Third Week	Fourth Week	Fifth Week	Sixth Week	Seventh Week	Eighth Week
Oil A											
2	Air	None	-1.1*	-0.85	+0.02	+0.43	+1.5	+2.8	+6.5	+9.1	
4	Oxygen	None	+1.2	+3.7	+14.2	+19.2	+23.1	+29.0	+35.5	+39.8	
6	Air	0.03% hydroquinone	-1.2	-1.0	-0.3	-0.05	+0.7	+0.9	+1.7	+2.0	
8	Oxygen	0.03% hydroquinone	+0.5*	+1.5	+3.0	+4.3	+6.5	+11.1	+17.7	+21.4	
Oil B											
10	Air	None	+0.1	+2.4	+5.6	+7.8	+10.5	+12.0	+14.4	+16.0	
12	Oxygen	None	+8.0	+15.6	+21.8	+29.7	+29.9	+35.5	+40.6	+44.8	
14	Air	0.03% hydroquinone	+0.5	-0.6	-0.3	-0.3	-0.2	+0.35	+1.1	+1.3	
16	Oxygen	0.03% hydroquinone	+1.2	+1.0	+2.8	+4.1	+5.8	+8.5	+13.1	+16.5	

* - Decrease in weight

+ Increase in weight

I—According to Greenbank (U S Patent 1,898,363) maleic acid inhibits the oxidation of unsaturated fats, oils, fatty acids and substances which contain fatty



Graph 3

weight in mg/Gm of oil is recorded graphically in Graph 3

material and tend to become rancid. In order to study the antioxidant effect, if any, of maleic acid in halibut liver oil, an experiment, similar to that described above for oils "A" and "B" was set up, in which samples of a halibut liver oil, containing, respectively, (a) no antioxidant, (b) 0.03% hydroquinone, and (c) 0.03% maleic acid, were exposed to pure oxygen for 5 weeks. As before, one series of samples was weighed weekly and a second series was tested colorimetrically for Vitamin "A" weekly. The oil containing maleic acid was no more resistant to oxidation than the plain halibut liver oil and, according to the color test, lost its Vitamin "A" potency at the same rate as the plain oil. The oil containing the hydroquinone showed the usual resistance to oxidation and loss of Vitamin "A". The change in

CONCLUSIONS

- 1 Hydroquinone retards the absorption of oxygen by refined halibut liver oil from air and an atmosphere of pure oxygen
- 2 Hydroquinone, as indicated by the Vitamin A color test retards the deterioration of Vitamin A of halibut liver oil upon exposure to air or pure oxygen
- 3 Hydroquinone, as shown by the biological test retards the deterioration of Vitamin A of Halibut Liver Oil upon exposure to air
- 4 Maleic acid does not act as an antioxidant in halibut liver oil

Biological assays reported herein were made in the Biological Research Laboratories of E R Squibb and Sons and we gratefully acknowledge their assistance, also that of Mr E Beaman of Research Laboratories of E R Squibb and Sons who assisted in our experimental work

REFERENCES

- (1) Christiansen, *et al*, Jour A Ph A, 18, 771 (1929)
- (2) Christiansen, Chappel, Briod, U S Patent 1,745,604
- (3) Biological Board of Canada, Bull No 37, 23 (1933)

ACCURACY AND SPEED FACTORS IN HAND-FILLING CAPSULES *

BY JOHN W LEE ¹

The primary purpose of this paper is to compare two of the usual methods ordinarily employed in hand-filling capsules One of the first problems that confronts us in either the establishment of a tolerance limit or the comparison of methods in hand-filling capsules, is the method or manner in which the contents of an individual capsule is determined

Some of the methods that have been used in determining the contents of an empty capsule are

(1) Dissolving the contents of the capsule in a suitable solvent and subsequent evaporation of the solvent ²

(2) Assay of the ingredients by the Official Process

(3) The emptying of the contents and weighing directly ³

(4) Using individual capsules of the same size as a counterpoise ²

(5) Weighing a number of filled capsules at the same time using an equal number of empty shells as a counterpoise, changing the empty shells for different ones after one or two operations ³

The first method has the disadvantage of requiring too long a time, and it is not always possible to find a suitable solvent especially, when the capsule contains a mixture of powders

The second method mentioned also requires too much time and is not practical enough for use by the practicing pharmacist

The third method, consisting of emptying the contents of the capsule and weighing directly is better suited for general use, but here again too much time is consumed and in the case of adhesive powders it is almost impossible to remove all of the powder from the shell

The fourth method using the empty shell as a counterpoise, introduces the error caused by the variance in weight of the individual shells

* Section on Practical Pharmacy and Dispensing, A Ph A, Washington meeting 1934

¹ Assistant Professor in Pharmaceutical Chemistry The George Washington University School of Pharmacy In collaboration with Prof W P Briggs

- Private communication

³ Mathews, Norris W, Jour A Ph A, 22, 321 (1933)

The fifth method eliminates to some degree the variance of the empty shell, but the average weight of the filled capsules must be taken, therefore it is not a true measure of the individual contents

Experiments were carried out in an effort to eliminate some of the errors as pointed out in the foregoing methods and to find a method accurate enough and practical enough to enable the practising pharmacist to assure himself that, in the great majority of cases, his work is within the reasonable limit of error

A number of empty shells ranging from twenty to one hundred were taken at random from stock, and each batch was weighed carefully on an analytical balance. The average weight of the individual shells in each batch was determined and then the averages of these averages computed. This figure was used as the tare in all instances where this size of capsule was employed

In private communications with some of the leading manufacturers of empty capsules the writer was informed that the weight of empty shells of the same lot rarely varied more than three per cent of the average weight of the empty shell. One manufacturer stated that the weight of an individual shell never varied more than seven per cent. This variance was due, it was stated, to the variable viscosity of the gelatin and the moisture content of the air. An additional factor to be taken into consideration is that empty shells made by different manufacturers may show a difference in wall thickness and hence some variation in weight. One manufacturer stated that a 10% error would probably be the maximum. If this be true, then a No. 1 capsule which weighs approximately 80 mg. would show an error of 8 mg. or about $\frac{1}{10}$ of a grain, which would amount to about a 2% error in a 5 gram capsule.

The following table shows the result obtained by weighing different batches of capsules taken at random from stock:

TABLE I.—WEIGHT EXPRESSED IN GRAMS

Number in Batch	No. 0 Capsule		No. 1 Capsule	
	Wt. of Batch	Average Wt. per Capsule	Wt. of Batch	Average Wt. per Capsule
20	2 1748	0 1087	1 6670	0 0833
20	2 1642	0 1082	1 6540	0 0827
20	2 1780	0 1089	1 6704	0 0835
50	5 3830	0 1076	4 1590	0 0831
50	5 4010	0 1080	4 1165	0 0823
100	10 8230	0 10823	8 1200	0 0812
<hr/>				
260—Total				
Average weight per capsule		0 1083		0 0827
Maximum variation per capsule, av. wt.		0 0012		0 0023
<hr/>				
	No. 2 Capsule		No. 3 Capsule	
	Wt. of Batch	Average Wt. per Capsule	Wt. of Batch	Average Wt. per Capsule
20	1 3598	0 0679	1 0566	0 0518
20	1 3610	0 0680	1 0584	0 0524
20	1 3400	0 0670	1 0278	0 0513
50	3 3495	0 0669	2 5770	0 0514
50	3 4000	0 0680	2 4535	0 04907
100	6 7550	0 0675	5 2030	0 0520
<hr/>				
260—Total				
Average weight per capsule		0 0675		0 0513
Maximum variation per capsule, av. wt.		0 0010		0 0033

Observing the table it will be noted that the maximum variation in weight per capsule based on the average weight is in the case of the No. 3 capsule. This variation is 3.3 mg. or about five hundredths of a grain. Now by using the average weight 0.0513 this variation is reduced by about one half, so it could be considered as practically negligible.

Two prescriptions of 12 capsules each were used in Table II. In both cases the theoretical content of the individual capsules was exactly five grains. Two methods were employed in determining the actual contents of each capsule. Method A consisted of weighing the capsule directly on an analytical balance and then subtracting the average weight of the same size empty capsule, as determined in Table I. Method B consisted of emptying the contents of the capsule on to a tared watch glass and then weighing on the analytical balance.

TABLE II—THE WEIGHTS ARE RECORDED IN GRAMS

Theoretical weight of 5 grain capsule in Gm. is 0.3240

Capsule	Prescription No. 1		Prescription No. 2	
	Method A	Method B	Method A	Method B
1	0.3355	0.3292	0.3013	0.2994
2	0.3303	0.3230	0.3163	0.3100
3	0.3179	0.3036	0.2859	0.2801
4	0.3319	0.3290	0.3243	0.3196
5	0.3067	0.3036	0.3577	0.3480
6	0.2597	0.2532	0.2633	0.2583
7	0.3073	0.2990	0.3163	0.3095
8	0.3443	0.3300	0.3917	0.3900
9	0.3369	0.3368	0.2973	0.2921
10	0.3099	0.3074	0.3133	0.3137
11	0.3189	0.3334	0.3743	0.3682
12	0.3093	0.3094	0.3423	0.3410
<hr/>				
Totals	3.8086	3.7576	3.8840	3.8299
	2.83%	3.35%	0.10%	1.52%

Percentage error based on theoretical weight 3.888

Table II shows that in both instances, using the average weight of the empty shell as a tare, the results were nearer the theoretical. Furthermore, in a comparison of the weight of the contents of individual capsules, the weights obtained by Method A are practically uniform, being slightly higher than the individual weight obtained by Method B.

There are three general methods usually employed in filling capsules by hand. The individual weighing of each capsule is undoubtedly the most accurate method, but it is not practical for ordinary dispensing.

The two methods upon which the comparison of accuracy and speed are determined in this paper are

(1) *The Punching Method*, consisting of filling the capsule directly from the entire quantity of the material either by repeatedly punching the shell in the powder until filled or forcing the powder into the shell by the aid of a spatula.

(2) *The Blocking Method*, in which the material is divided into a uniform square and then into the desired number of divisions, the material in each division being placed in a capsule.

There are several factors to be taken into consideration in the comparison of the accuracy of these two methods. First, the comparison must be based upon the quantity of material per capsule, since it is uniform distribution of the material through the desired number of capsules that is important. To base it upon the theoretical average weight per capsule determined from the theoretical total weight of the ingredients would not be correct but would merely be a measure of the error.

in weighing plus the error in loss of material on the tile, etc. In the case of tolerance establishment this weighing error would be important, but not in a comparison of the accuracy of the two methods of filling. The true index as to the accuracy of filling then must be based upon the distribution of the material contained in the entire lot of capsules, not the amount that should have been placed in them. If, then, the average weight of the contents per capsule is based upon the actual weight of the total contents as determined by weighing on an analytical balance, we have a true estimate as to the quantity each capsule should contain. *Secondly*, the nature of the material would have some effect on the accuracy, so the prescriptions selected, bearing this in mind, consist of (1) a powder of medium weight and bulk, (2) a bulky powder, (3) a compact powder, (4) a mixture of bulky powders and (5) a mixture of heavy powders. *Thrd*, the comparison must be based upon the same prescription so every operator filled each prescription twice, once by each method.

The speed factor in hand-filling capsules is important enough in most cases to be considered, but it must not be intimated that accuracy should be sacrificed in order to save time. In determining the time required in the filling operation by the two different methods, it was assumed that since in each method the same weighing and triturations were necessary, the time would be the same. We therefore started measuring time from the point after complete trituration, at which the actual blocking or punching, as the case might be, was started.

The following prescriptions were filled by students of the senior class in Dispensing Pharmacy, at The George Washington University School of Pharmacy. The students were not told that the prescriptions were to be checked for accuracy but were instructed to fill the first prescription by the blocking method, the second by punching alternating until all the prescriptions had been filled. At another laboratory period the students were given the same prescriptions and instructed to use the opposite method in filling them than was employed before. In this manner each prescription was filled by each of the two methods and by the same student.

R ₁ 1	Acidum Acetylsalicylicum	5 i	R ₄ 4	Carbo Ligni	
	℞ ft Cap xii			Phenolphthaleum	aa gr ss
R ₂ 2	Quinina Sulphas	gr ʒʒʒʒ		Acetphenetidinum	
	℞ ft Cap xii			Phenylis Salicylas	aa gr xx
R ₃ 3	Bismuthi Subnitras	5 i		℞ ft Cap x	
	Ft Cap xii		R ₅ 5	Hydrargyri Chloridum Mite	gr vii
				Sodu Bicarbonas	gr ʒʒʒʒ
				℞ ft Cap xii	

The following tables show the results obtained by each method of filling the prescriptions. In order to have some standard upon which to base the comparison as to the accuracy of the two methods, a ten per cent variance was arbitrarily selected, either plus or minus, from the theoretical average weight of contents per capsule.

TABLE III—PRESCRIPTION NO. 1 Theoretical weight of ingredients in Gm, 3.8880
Punching Method

Operator	Actual Wt Total Contents of 12 Capsules	Weighing Error	Theoret Wt per Capsule Based on Actual Wt of Total Contents	No of Capsules within 10% Error Plus or Minus	No of Capsules Having an Error Greater Than 10%	Time in Min to Fill Prescrip- tions
1	3.5166	0.3714—	0.2930	7	5	7
2	3.967	0.079+	0.3305	11	1	4
3	3.757	0.131—	0.3130	10	2	9

4	3 9628	0 074+	0 3302	12	0	5
5	3 9242	0 036+	0 3270	9	3	5
6	3 7852	0 1028—	0 3154	8	4	4
7	4 0840	0 196+	0 3605	11	1	6
8	3 9182	0 030+	0 3265	11	1	3
9	3 9956	0 1076+	0 3329	11	1	5
10	4 1756	0 287+	0 3479	10	2	7
Totals				100	20	55

Blocking Method

1	3 823	0 065—	0 3185	8	4	8
2	3 741	0 147—	0 3117	10	2	7
3	3 9946	0 106+	0 3328	6	6	10
4	4 001	0 113+	0 3334	6	6	10
5	3 9672	0 079+	0 3306	8	4	6
6	3 9416	0 0536+	0 3284	10	2	5
7	3 9663	0 078+	0 3305	9	3	9
8	3 8800	0 008—	0 3265	9	3	7
9	3 8100	0 075—	0 3175	10	2	7
10	3 8010	0 087—	0 3167	9	3	8
Totals				85	35	77

TABLE IV —PRESCRIPTION No 2 Theoretical weight of ingredients in Gm 2 3328

Punching Method

Operator	Actual Wt Total Contents of 12 Capsules	Weighing Error	Theoret Wt per Capsule Based on Actual Wt of Total Contents	No of Capsules within 10% Error Plus or Minus	No of Capsules Having an Error Greater Than 10%	Time in Min to Fill Prescrip- tions
1	2 2932	-0 0396	0 1911	6	6	4
2	2 3768	+0 0440	0 1984	8	4	3
3	2 3708	+0 0380	0 1975	11	1	6
4	2 1396	-0 1932	0 1783	11	1	5
5	2 2656	-0 0672	0 1888	4	8	4
6	2 3036	-0 0292	0 1919	5	7	3
7	2 624	+0 2914	0 2186	10	2	8
8	2 0998	-0 2330	0 1749	10	2	3
9	2 1948	-0 1380	0 1829	10	2	6
10	2 2940	-0 0388	0 1915	12	0	7
Totals				87	33	49

Blocking Method

1	2 3394	+0 0066	0 1949	7	5	9
2	2 2988	-0 0340	0 1916	9	3	9
3	2 5876	+0 2888	0 2156	10	2	6
4	2 3066	-0 0262	0 1922	7	5	11
5	2 3964	+0 0636	0 1977	10	2	8
6	2 3726	+0 0398	0 1969	10	2	6
7	2 3138	-0 0190	0 1923	9	3	10
8	2 7424	+0 4096	0 2287	10	2	8
9	2 2968	-0 0360	0 1914	10	2	8
10	2 4584	+0 1256	0 2048	7	5	6
Totals				89	31	81

TABLE V—PRESCRIPTION No 3 Theoretical weight of ingredients in Gm , 3 888

Punching Method

Operator	Actual Wt Total Contents of 12 Capsules	Weighing Error	Theoreti- cal Wt per Capsule Based on Actual Wt. of Total Contents	No of Capsules within 10% Error Plus or Minus	No of Capsules Having an Error Greater Than 10%	Time in Min to Fill Prescrip- tions
1	3 888	0 000	0 3260	8	4	5
2	3 8688	-0 019	0 3226	5	7	7
3	4 8720	+0 984	0 4060	11	1	3
4	3 9916	+0 103	0 3326	9	3	7
5	4 6544	+0 766	0 3878	8	4	5
6	3 6866	-0 201	0 3072	12	0	5
7	4 0785	+0 1905	0 3398	7	5	7
8	3 7004	-0 187	0 3083	11	1	3
9	4 0240	+0 136	0 3353	5	7	9
10	3 8728	-0 015	0 3227	8	4	5
Totals				84	36	56

Blocking Method

1	3 9104	+0 022	0 3258	5	7	8
2	3 9330	+0 045	0 3277	8	4	7
3	3 8792	-0 0085	0 3232	6	6	4
4	3 9527	+0 0647	0 3295	8	4	10
5	4 6544	+0 885	0 3978	7	5	3
6	4 072	+0 184	0 3393	8	4	10
7	4 0224	+0 134	0 3352	6	6	14
8	3 7268	-0 161	0 3105	8	4	5
9	4 1314	+0 243	0 3442	12	0	7
10	3 8738	-0 014	0 3228	7	5	6
Totals				75	45	74

TABLE VI—PRESCRIPTION No 4 Theoretical weight of ingredients in Gm , 2 6556

Punching Method

Operator	Actual Wt Total Contents of 12 Capsules	Weighing Error	Theoreti- cal Wt Per Capsule Based on Actual Wt. of Total Contents	No of Capsules within 10% Error Plus or Minus	No of Capsules Having an Error Greater Than 10%	Time in Min to Fill Prescrip- tions
1	3 2298	+0 5742	0 3229	10	0	4
2	2 5690	-0 0866	0 2569	9	1	6
3	2 7284	+0 0728	0 2728	10	0	5
4	2 9516	+0 2960	0 2951	7	3	9
5	2 6064	-0 0492	0 2606	6	4	5
6	2 7308	+0 0752	0 2730	8	2	10
7	2 8246	+0 1690	0 2824	10	0	3
8	3 0372	+0 4816	0 3037	9	1	7
9	2 6270	-0 0286	0 2627	10	0	4
10	2 0410	-0 6146	0 2041	2	8	7
Totals				81	19	60

Blocking Method

1	2 6382	-0 0174	0 2638	8	2	11
2	2 8260	+0 1704	0 2826	10	0	5
3	2 9838	+0 3282	0 2983	10	0	4
4	2 7166	+0 0610	0 2716	8	2	8
5	2 6072	-0 0484	0 2607	7	3	9
6	2 9600	+0 3046	0 2960	8	2	16
7	2 6722	+0 0166	0 2672	8	2	5
8	2 7014	+0 0458	0 2701	7	3	11
9	2 5394	-0 1162	0 2539	7	3	9
10	2 4910	-0 1646	0 2491	6	4	7
Totals				79	21	85

TABLE VII—PRESCRIPTION NO 5 Theoretical weight of ingredients in Gm 3 1104

Punching Method

Operator	Actual Wt Total Contents of 12 Capsules	Weighing Error	Theoretical Wt. per Capsule Based on Actual Wt of Total Contents	No of Capsules within 10% Error Plus or Minus	No of Capsules Having an Error Greater Than 10%	Time in Min to Fill Prescrip- tions
1	2 9460	-0 1644	0 2455	6	6	4
2	3 5660	+0 4556	0 2972	9	3	5
3	3 2402	+0 1298	0 2700	5	7	6
4	3 2018	+0 0914	0 2668	9	3	6
5	3 2333	+0 1229	0 2693	10	2	5
6	2 7505	-0 3599	0 2292	8	4	7
7	3 0317	-0 0787	0 2526	11	1	4
8	3 0382	-0 0722	0 2531	4	8	3
9	2 9799	-0 1305	0 2483	6	6	4
10	2 8483	-0 2621	0 2373	7	5	6
Totals				75	45	50

Blocking Method

1	2 9414	-0 1690	0 2452	6	6	6
2	3 1952	+0 0848	0 2663	12	0	7
3	3 7322	+0 6218	0 3110	10	2	5
4	3 2088	+0 0984	0 2674	9	3	8
5	2 9063	-0 2041	0 2422	7	5	8
6	3 0942	-0 0162	0 2578	5	7	11
7	3 0422	-0 0682	0 2535	11	1	5
8	3 0448	-0 0656	0 2537	4	8	4
9	3 0056	-0 1048	0 2508	6	6	7
10	3 0714	-0 0390	0 2559	8	4	7
Totals				78	42	68

SUMMARY OF TABLES III, IV V VI AND VII

Punching Method

Prescription Number	Number of Capsules within 10% Error Plus or Minus	Number of Capsules Having an Error Greater Than 10%	Time in Minutes
1	100	20	55
2	87	33	49

3	84	36	55
4	81	19	60
5	75	45	50
	—	—	—
Totals	427	153	269

Percentage of total capsules filled 73 6% 26 4%

Average time required to fill one capsule 27 6 seconds

Blocking Method

1	85	35	77
2	89	31	81
3	75	45	74
4	79	21	85
5	78	42	68
	—	—	—
Totals	406	174	385

Percentage of total capsules filled 70% 30%

Average time required to fill one capsule 37 2 seconds

The foregoing tables show a striking uniformity in the degree of accuracy, obtained by average operators, working under ordinary conditions and filling capsules by punching or blocking methods

As was expected, the punching method required about $\frac{1}{2}$ less time for filling than the blocking method

Another significant point is that out of the one hundred prescriptions filled only nine came within the arbitrary 10% limit of variance. Of these nine, five were filled by the punching method and four by the blocking method

CONCLUSIONS

(1) The comparative accuracy between blocking and punching of capsules is in direct ratio to the skill of the operator

(2) Considerably less time is required in punching than in blocking and with a comparable degree of accuracy

(3) The results obtained in this study, which do not contain the weighing error, clearly indicate that a tolerance of more than 10% should be established

(4) The average weight of an empty gelatin capsule obtained by the method herein described may be used as a tare in determining the weight of filled capsules

Major General Charles R. Reynolds, the new Surgeon General of the Army, received the degree of M D from the University of Pennsylvania in 1899. He entered the service of Medical Corps of the army in 1900 and served through the various grades to Colonel and entered upon his duties as Surgeon General June 2, 1935. He served in the Philippines and had a brilliant record during the World War, was awarded the Distinguished Service Medal and the Silver Star and is an officer of the French Legion of Honor. He has written

many professional papers having a bearing on military medical matters

Dr James F. Couch, chemist of the Bureau of Animal Industry of the Department of Agriculture and professor of historical science at the National University, has been elected president of the Chemical Society of Washington, D C

The New York Pharmacist with the April issue, became the property of the New York State Pharmaceutical Association and is now known as the *New York State Pharmacist*

DETERMINATION OF THE REASONABLE OR PERMISSIBLE MARGIN
OF ERROR IN DISPENSING V LIQUIDS *BY MARVIN J ANDREWS ¹

INTRODUCTION

In the first paper of this series, it was stated that the different types of prescriptions which the pharmacist is ordinarily called upon to fill may be divided, roughly, into two groups, namely, liquids and solids. The four papers presented to date deal only with the more frequently encountered types of the latter, *viz* Powders and Capsules (1), Ointments (2), Suppositories (3), and Pills (4). Thus, the fifth paper of the series, deals with Liquids.

Liquids called for on prescriptions are usually measured, the volume in most cases, being determined by using either a cylindrical or conical graduate. The possibilities for error in measuring a definite volume of a liquid are greater in number than is commonly held. Fortunately, most of them may be ignored as the error involved is too small to be of practical significance. In fact, only three need be considered for the purpose of this study. They are believed to be, in the order of their importance (1) the nature of the liquid to be measured, (2) the shape and size of the graduate used, and (3) the personal equation. To determine to what extent each of these factors is responsible for the total deviation from the standard, the studies reported in this paper were undertaken.

EXPERIMENTAL PART

For the purpose of the study reported in this paper, two series of tests were made. The object of the first was to determine the relationship, if any, between the size and shape of the graduate used and the magnitude of the observed error in the measurement of definite volumes. The object of the second was to determine to what extent the magnitude of error was effected by certain physical properties of liquids, such as color, viscosity, etc.

In the actual performance of these tests, the liquids were measured in both cylindrical and conical graduates by 100 members of the senior class in dispensing pharmacy at the School of Pharmacy of the University of Maryland. In each case the liquid was poured from a quart bottle into the graduate, held in the hand of the dispenser, then transferred to a prescription bottle. The contents of the bottle were again transferred to a tared container and accurately weighed on a chainomatic balance. The temperature of the liquids in both series of tests ranged from 22° C. to 25° C.

Each dispenser was assigned a definite number so the variation in the work of any individual could be followed throughout both series. The weight of all measurements is reported.

SERIES I

In the first series of tests definite volumes of distilled water were measured by the dispenser in 10-, 25-, 50- and 100-cc cylindrical and conical graduates

* Joint Session, Scientific Section and Section on Practical Pharmacy and Dispensing, A. Ph. A., Washington meeting, 1934.

¹ In collaboration with A. G. DuMez, Professor of Pharmacy, School of Pharmacy, University of Maryland.

The results of the first series of tests are presented in Table I

TABLE I—EFFECT OF SIZE AND SHAPE OF GRADUATE ON MEASUREMENT OF DEFINITE VOLUMES OF LIQUID

Dispenser Number	10 Cc		25 Cc		50 Cc		100 Cc	
	Cyl	Con	Cyl	Con	Cyl	Con	Cyl	Con
1.	9.579	9.555	24.653	24.510	49.457	48.285	98.283	98.052
2.	9.647	9.860	24.615	23.957	49.801	48.653	98.048	99.242
3.	9.855	9.718	24.812	24.474	49.593	48.890	98.439	98.917
4.	9.653	9.410	23.622	25.231	49.417	47.836	96.715	96.637
5.	9.528	9.523	24.550	24.219	50.208	46.385	99.313	98.319
6.	9.729	9.798	24.742	24.354	49.659	46.385	98.902	97.343
7.	9.343	9.948	24.961	24.856	49.835	48.689	98.002	101.368
8.	9.373	9.529	23.444	24.745	49.140	47.379	97.815	93.970
9.	9.691	10.004	24.995	24.501	49.789	50.147	99.046	100.590
10.	9.227	9.182	24.287	22.919	48.841	47.253	97.673	98.600
11.	9.718	9.778	24.716	23.710	50.022	46.766	98.745	95.200
12.	9.455	9.586	24.383	23.721	48.842	48.948	97.804	96.911
13.	9.517	9.584	25.626	24.328	50.023	49.023	98.705	96.561
14.	9.700	9.459	24.704	22.910	49.400	48.177	98.942	93.812
15.	9.401	9.965	24.170	24.462	50.081	49.300	98.773	98.995
16.	9.717	9.632	24.336	23.848	48.964	48.553	98.478	99.201
17.	9.487	9.620	24.340	23.339	48.787	47.335	97.637	100.009
18.	9.674	9.792	24.535	24.669	49.484	50.331	98.548	99.264
19.	9.660	9.533	24.829	25.110	49.333	49.842	99.523	100.424
20.	9.561	9.944	24.170	25.135	50.170	50.036	98.753	99.740
21.	9.475	9.768	23.844	24.729	49.047	49.475	98.534	98.856
22.	9.130	9.484	24.500	24.481	49.312	49.553	97.866	96.409
23.	9.617	9.838	24.765	24.610	50.024	49.784	98.741	98.443
24.	9.617	9.951	24.905	24.604	49.131	49.362	98.400	98.777
25.	9.844	9.600	24.177	23.843	49.152	47.778	97.963	97.034
26.	8.985	8.748	24.418	23.986	49.015	47.681	98.212	94.765
27.	9.620	10.000	24.936	23.584	47.962	47.351	98.311	95.958
28.	9.231	9.145	24.060	23.642	47.910	48.739	97.456	95.683
29.	9.515	9.664	24.830	23.274	49.927	50.154	97.603	98.490
30.	9.600	9.810	24.775	24.476	49.727	49.469	98.353	100.326
31.	9.258	9.081	21.951	24.130	49.154	49.673	98.389	99.169
32.	9.572	9.354	24.655	23.406	49.746	48.444	95.119	95.420
33.	9.661	9.779	24.686	24.867	49.978	50.067	98.871	100.131
34.	9.522	9.843	23.980	23.851	49.537	48.623	98.605	99.491
35.	9.355	9.681	24.880	24.296	48.877	50.013	97.450	96.529
36.	9.284	9.377	24.556	24.252	48.741	48.459	98.537	96.729
37.	9.636	9.417	24.302	23.104	49.365	47.971	100.021	97.117
38.	9.654	9.568	24.445	24.829	50.472	49.367	98.440	98.608
39.	9.385	9.577	24.246	24.476	49.500	51.393	98.250	97.262
40.	9.540	9.601	23.355	24.021	46.653	49.337	97.403	98.365
41.	9.505	9.250	24.542	24.161	48.670	49.170	98.262	96.100
42.	9.476	9.408	23.986	23.359	48.353	47.907	97.661	97.286
43.	9.537	9.454	24.441	23.058	49.400	49.000	98.444	95.646
44.	9.832	9.705	24.920	24.470	49.521	49.221	98.540	96.049
45.	9.349	9.753	24.674	24.247	49.751	49.911	98.623	98.312
46.	9.337	9.337	24.500	21.000	49.298	45.857	97.865	98.800
47.	9.208	9.263	24.620	23.809	47.842	49.876	98.601	93.335
48.	9.567	9.202	24.362	24.107	48.875	49.205	97.904	96.937
49.	9.588	9.571	24.304	23.119	49.344	49.308	98.341	94.980
50.	9.235	9.772	22.684	25.102	49.928	49.272	97.600	96.069

51.	9.604	9.004	24.352	22.985	49.055	47.230	98.974	96.120
52.	9.515	10.209	25.003	24.107	49.653	48.348	98.210	99.056
53.	9.476	9.606	24.448	23.504	49.764	49.676	98.479	98.191
54.	9.510	9.842	24.608	24.445	49.744	49.228	98.461	97.565
55.	9.817	10.075	25.416	23.201	49.194	49.006	97.981	97.134
56.	9.601	9.348	24.376	23.210	49.341	48.258	98.003	99.001
57.	9.556	9.406	24.431	23.613	48.353	47.633	98.242	99.705
58.	8.943	9.468	24.347	24.782	49.971	47.843	97.970	98.831
59.	9.638	9.550	24.391	23.562	47.342	48.668	98.003	96.674
60.	9.660	10.301	24.239	23.504	49.396	47.962	98.966	97.748
61.	9.949	9.671	23.998	24.200	47.902	49.941	98.827	97.990
62.	9.777	9.864	24.539	23.121	50.155	48.261	97.050	97.957
63.	9.682	9.038	24.952	24.452	50.065	49.724	98.937	100.421
64.	9.452	9.262	23.641	23.490	49.078	48.531	97.730	100.348
65.	9.708	9.702	24.601	23.556	49.762	49.783	98.551	95.742
66.	9.678	9.910	24.640	24.228	48.741	49.190	98.320	99.311
67.	9.523	9.790	24.503	23.727	49.622	50.169	98.882	98.009
68.	9.501	9.164	24.107	22.746	49.104	47.386	98.816	98.612
69.	9.938	9.726	24.955	24.945	49.940	50.860	99.830	97.723
70.	9.573	9.587	24.872	24.900	49.590	48.976	97.631	96.867
71.	9.912	9.716	24.182	22.911	47.654	49.829	98.506	99.004
72.	9.721	9.543	24.748	22.733	47.820	46.303	98.209	94.402
73.	9.357	9.543	23.126	24.283	47.124	49.100	94.564	98.696
74.	9.453	9.712	24.389	21.795	49.281	48.472	98.872	97.838
75.	9.588	9.739	24.941	24.481	49.502	49.777	98.768	97.594
76.	9.485	9.229	24.633	23.268	49.239	50.036	98.002	98.753
77.	9.483	10.035	24.913	24.076	49.046	48.921	98.470	99.126
78.	9.732	9.451	24.105	24.929	49.835	46.891	98.422	96.770
79.	9.462	9.383	24.314	23.709	49.876	49.834	98.104	98.163
80.	9.589	9.678	24.483	23.771	49.186	49.260	98.683	96.768
81.	9.733	10.028	25.007	23.928	49.644	48.386	99.172	97.804
82.	9.740	9.681	24.510	23.674	48.765	50.984	98.644	99.433
83.	9.667	9.760	24.590	24.184	49.776	47.566	98.238	95.723
84.	9.629	9.630	24.710	24.740	49.386	49.937	98.636	100.388
85.	9.819	10.151	24.814	24.281	49.663	48.447	98.907	100.233
86.	9.637	9.469	24.933	24.912	49.763	48.885	96.876	99.423
87.	9.369	9.365	24.799	24.043	48.065	50.226	97.986	98.149
88.	9.637	9.722	24.888	24.341	48.382	47.635	97.380	97.932
89.	9.466	9.691	24.905	24.307	48.363	45.516	98.780	101.177
90.	9.506	9.512	24.292	24.178	49.374	49.783	98.389	99.905
91.	9.650	9.108	24.777	23.876	48.350	47.031	98.704	94.353
92.	9.991	9.104	24.835	24.202	49.601	47.561	96.550	99.961
93.	9.596	10.228	24.669	24.525	49.128	50.146	98.722	99.547
94.	9.623	9.349	24.763	24.892	49.104	49.582	98.315	97.081
95.	10.651	9.876	24.339	23.653	50.102	46.783	97.014	101.900
96.	9.484	9.806	24.341	24.256	50.653	47.343	98.333	99.502
97.	9.292	9.402	24.349	23.406	49.876	51.437	98.136	96.332
98.	9.154	9.135	24.687	23.778	49.783	48.106	98.268	98.030
99.	9.724	9.630	24.678	24.040	49.386	48.462	98.336	96.668
100.	9.203	9.973	25.067	24.103	49.336	47.286	97.643	94.192
Av Wt	9.561	9.606	24.481	23.994	49.258	48.758	98.240	97.881
S D *	0.224	0.290	0.503	0.708	0.727	1.203	0.767	1.802
% D ¹	2.34%	3.11%	2.05%	2.95%	1.48%	2.47%	0.78%	1.84%

* Standard Deviation expressed in grams

¹ Percentage Deviation based on average weight

The tabulated data given in Table I shows there is an error due to the size and shape of the graduate. The magnitude of error is considerably greater when a conical graduate is used than when a cylindrical graduate is used. With respect to size just the opposite is true, the larger the graduate and the larger the volume measured the smaller the per cent of error. For instance in the measurement of 10 cc of distilled water in a cylindrical graduate the average error based on the standard deviation amounted to 2.34%. When a 10-cc conical graduate was used it amounted to 3.11%. That the magnitude of the error is greater when the smaller graduate was used than when the larger graduate was used is shown when the volume measured was 100 cc, and a 100 cc graduate was used in making the measurements, the average error amounted to only 0.78% in the case of the cylindrical graduate and 1.84% in the case of the conical graduate.

The error due to the personal equation is naturally indefinite. In fact, it was found to be impractical to attempt to measure it separately. The error is revealed by a definite trend in a series of measurements made by an individual rather than by the observation made on a single measurement. For example, in the series of measurements made by dispenser number 1 it will be observed that a majority of the measurements here were high when compared with the average, while those of dispenser number 10 were below the average.

No effort was made to determine what the personal equation was in these cases so that an accurate statement cannot be made concerning its nature. In some cases it may have been the result of defective vision, in others it may have been due to natural carelessness, in other instances it may have been due to using the upper meniscus at times and at other times the lower meniscus for making measurements, or to some other trait of the individual making the measurements.

The results presented in Table I are summarized in Table II, which follows. This table shows the actual number of measurements falling within the standard deviation and multiples thereof. Furthermore, the table shows the per cent of measurements falling within any one group, since the total number of measurements made in each case was exactly 100.

TABLE II—SUMMARY OF RESULTS PRESENTED IN TABLE I

Liquid to Be Measured	Volume Measured in Cc	Shape of Graduate Used	Average Weight in Gm	Standard Deviation in Gm	Number of Measurements Falling within			
					1 X S D	2 X S D	3 X S D	4 X S D or Over
Distilled Water	10	Cyl	9.561	0.224	78	19	2	1
Distilled Water	10	Con	9.606	0.290	70	25	5	0
Distilled Water	25	Cyl	24.481	0.503	85	9	4	2
Distilled Water	25	Con	23.994	0.708	68	30	0	2
Distilled Water	50	Cyl	49.258	0.727	74	22	3	1
Distilled Water	50	Con	48.758	1.203	69	26	5	0
Distilled Water	100	Cyl	98.240	0.767	83	12	3	2
Distilled Water	100	Con	97.881	1.802	67	28	5	0

The second series of tests was conducted to determine the effect of certain physical properties of liquids on the measurement of a definite volume. With this object in view the following liquids were selected:

(1) Elixir of Iron, Quinine and Strychnine N F, as a green colored liquid, (2) Syrup, U S P, as a viscous clear liquid, (3) Milk of Magnesia, U S P, as an opaque liquid, and (4) Castor Oil, U S P, as an oily liquid.

To obtain comparative data, the same cylindrical and conical graduates used in measuring the 100 cc of Distilled Water in the first series of tests, were used in this series. The results of the second series of tests are given in Table III.

TABLE III—EFFECT OF CERTAIN PHYSICAL PROPERTIES OF LIQUIDS ON THE MAGNITUDE OF ERROR

Ether I Q S		Syrup		Milk of Magnesia		Castor Oil		Dispenser Num ber
Cyl	Con	Cyl	Con	Cyl	Con	Cyl	Con	
103.912	105.721	126.239	130.634	94.277	95.533	81.218	94.358	1.
104.616	105.169	125.316	128.371	101.501	93.585	90.491	87.204	2.
104.352	103.355	118.564	129.030	93.607	92.510	89.362	84.856	3.
104.251	104.403	123.108	126.035	94.705	101.491	89.300	82.680	4.
104.318	106.825	125.292	126.832	97.774	99.214	85.930	90.081	5.
103.256	101.860	122.514	129.866	94.000	93.933	84.333	84.352	6.
104.318	100.819	126.471	122.857	98.027	89.337	86.222	93.861	7.
101.712	101.838	124.300	124.772	92.631	88.506	89.515	85.641	8.
104.643	103.834	125.084	129.579	93.107	99.102	89.801	87.405	9.
103.953	100.100	126.656	120.159	93.239	88.941	89.086	80.474	10.
104.229	101.246	124.049	123.073	95.097	100.287	92.100	87.673	11.
104.054	102.125	125.450	122.511	90.924	90.785	91.311	84.130	12.
104.375	105.640	127.315	128.417	99.762	100.747	86.416	87.381	13.
103.088	100.714	125.823	127.586	92.725	93.730	84.803	86.960	14.
104.122	103.030	124.522	130.190	91.873	93.310	88.876	82.388	15.
104.451	105.937	125.141	130.632	91.260	92.836	91.340	92.253	16.
103.743	102.488	123.965	123.376	93.453	94.687	87.587	90.040	17.
104.442	104.002	121.520	126.646	97.266	96.361	86.889	91.420	18.
104.882	107.639	124.420	127.288	99.424	94.666	85.829	86.264	19.
104.455	107.165	124.510	133.900	93.595	101.015	90.888	88.206	20.
103.505	106.843	121.258	123.896	92.909	91.051	89.712	89.914	21.
104.383	103.567	127.533	129.635	95.747	96.066	91.535	90.416	22.
104.417	107.950	128.727	132.664	98.576	96.087	89.151	89.097	23.
103.758	103.323	124.188	132.217	92.377	93.932	95.985	97.780	24.
103.455	98.961	125.296	121.748	94.776	94.764	91.856	89.042	25.
101.128	103.885	124.703	128.611	92.271	96.410	81.262	84.076	26.
104.200	105.251	124.510	129.791	93.438	97.810	80.374	89.891	27.
103.290	101.965	125.746	123.473	93.091	91.271	87.200	85.853	28.
102.850	103.075	124.602	125.312	94.425	95.168	83.950	82.057	29.
104.991	103.581	122.672	132.161	98.744	100.002	84.442	85.214	30.
102.492	104.034	120.040	125.252	92.776	91.035	85.150	83.727	31.
103.902	102.730	123.021	125.508	90.431	93.059	82.224	79.224	32.
104.053	101.387	127.582	134.551	93.784	93.823	88.900	88.389	33.
104.392	102.056	127.613	126.704	97.487	98.066	93.470	84.637	34.
103.792	103.585	124.763	125.242	93.981	91.906	87.990	88.673	35.
104.267	108.794	123.323	127.172	93.381	92.345	77.756	78.931	36.
103.580	103.600	122.779	124.210	92.234	96.937	78.873	74.778	37.
106.219	103.783	124.039	129.918	94.546	98.823	82.670	84.768	38.
104.002	104.135	121.910	127.921	96.919	93.900	81.307	86.300	39.
104.379	105.932	123.700	125.678	94.222	98.302	91.318	81.351	40.
103.973	104.077	120.211	120.660	95.040	90.997	90.588	83.593	41.
103.472	104.082	124.862	123.270	97.088	92.449	78.413	99.688	42.
103.874	98.793	123.566	126.066	94.700	94.738	87.579	87.730	43.
104.048	103.592	124.363	128.529	92.859	93.882	88.885	81.158	44.
103.728	103.366	123.234	127.907	93.537	100.837	83.584	82.365	45.
103.920	102.187	121.090	122.183	92.327	90.486	86.873	83.277	46.
104.056	102.192	127.164	125.773	91.200	91.680	88.609	83.551	47.
103.881	105.031	124.634	127.411	93.643	94.768	87.549	79.439	48.
101.942	105.649	123.814	127.059	94.200	94.830	86.533	81.672	49.
100.130	104.144	125.064	125.902	97.102	91.874	87.589	97.041	50.

104.220	100.849	127.508	125.815	92.304	95.114	92.705	86.443	51.
104.221	105.980	126.184	131.553	94.949	96.272	88.733	86.821	52.
104.251	98.261	125.672	134.053	96.126	99.537	87.221	94.999	53.
105.263	106.625	123.988	127.516	101.291	93.279	88.736	95.194	54.
104.257	103.140	120.802	123.582	96.449	95.500	86.825	86.491	55.
104.013	106.221	121.343	125.064	94.508	97.651	88.382	80.959	56.
106.003	104.612	122.952	129.540	89.383	94.970	87.486	91.723	57.
104.583	104.248	127.944	125.593	98.427	96.228	90.490	88.451	58.
103.788	107.811	125.285	125.868	92.978	94.715	94.942	89.894	59.
102.384	104.025	117.325	124.333	91.980	94.233	84.364	87.272	60.
102.681	99.258	123.321	125.324	88.832	89.121	91.836	84.651	61.
103.377	107.395	126.056	132.802	94.200	97.115	87.321	89.336	62.
106.615	104.880	126.326	130.639	95.236	94.993	87.749	93.265	63.
105.527	104.623	120.935	125.761	100.304	94.160	83.647	88.772	64.
103.265	101.985	122.343	122.693	96.382	99.416	89.280	85.191	65.
103.527	99.563	124.384	122.876	91.104	96.403	91.630	84.180	66.
104.051	106.786	124.678	130.639	94.507	93.300	85.676	81.684	67.
105.357	106.001	125.565	123.774	99.909	94.948	96.776	87.603	68.
103.902	103.663	124.621	126.795	93.430	93.915	85.690	87.116	69.
104.778	105.370	125.859	129.509	99.742	95.432	83.529	84.965	70.
103.690	102.844	125.231	122.525	95.461	94.111	87.325	79.603	71.
103.672	100.578	118.993	121.108	93.729	90.062	96.146	97.798	72.
104.872	104.530	124.484	125.028	93.606	96.050	84.382	88.743	73.
105.477	103.923	123.120	123.579	93.428	94.127	87.175	86.262	74.
104.452	104.038	122.561	128.706	96.711	96.045	84.589	91.220	75.
104.005	105.483	126.936	122.363	95.369	98.710	91.365	94.323	76.
103.714	104.935	125.758	133.774	94.805	94.350	92.787	81.604	77.
104.162	105.057	125.101	127.424	98.728	94.779	86.487	89.463	78.
103.610	101.683	126.802	123.945	93.347	97.996	86.170	81.147	79.
103.334	101.810	126.740	123.543	95.250	95.584	91.765	88.502	80.
104.536	104.403	124.763	129.183	98.730	94.618	96.881	81.361	81.
105.631	103.457	120.999	125.440	95.672	97.335	88.461	87.732	82.
104.727	100.157	123.364	127.942	95.661	92.308	85.395	95.156	83.
105.006	104.987	127.376	129.519	96.100	94.585	95.601	82.397	84.
103.679	105.343	124.122	124.110	100.375	101.652	88.649	88.760	85.
105.104	106.424	123.428	124.300	94.899	99.031	85.031	87.515	86.
105.643	105.707	121.417	127.986	93.390	98.470	88.463	74.383	87.
104.325	100.955	122.765	125.045	95.588	94.613	87.637	91.687	88.
103.762	100.040	125.502	127.800	95.347	92.327	88.473	89.579	89.
103.624	105.794	118.640	121.091	93.493	97.000	85.368	84.652	90.
104.133	106.505	124.335	130.632	94.240	101.964	88.912	89.571	91.
104.876	105.122	126.255	129.312	96.400	101.782	87.251	90.784	92.
103.272	103.505	123.035	129.669	96.662	100.734	91.328	96.646	93.
104.018	106.061	128.643	126.387	97.483	95.602	88.151	99.648	94.
104.051	99.018	125.340	128.006	94.307	94.328	85.337	87.934	95.
104.688	104.350	129.288	125.665	95.670	99.775	81.565	84.572	96.
103.672	104.531	129.780	129.822	92.445	91.839	86.861	75.121	97.
103.676	98.521	122.793	120.471	90.347	90.370	80.845	85.813	98.
103.395	103.320	122.176	127.747	93.527	95.846	94.033	86.527	99.
104.783	107.346	120.760	121.229	100.674	95.201	86.130	86.941	100.
104 049	103 752	124 298	126 753	94 895	95 254	87 742	87 017	Av Wt
0 926	2 329	2 368	3 333	2 644	3 151	3 938	5 087	S D *
0 89%	2 24%	1 91%	2 63%	2 79%	3 31%	4 49%	5 85%	% D ¹

* Standard Deviation expressed in grams

¹ Percentage Deviation based on average weight

The foregoing tabulation shows that errors are made in measurement and therefore the deviation from the standard is affected by the nature of the liquid measured. The magnitude of the error observed was in the following order: Distilled Water, Elixir of Iron, Quinine and Strychnine, Syrup, Milk of Magnesia and Castor Oil. The physical properties responsible for the great part were found to be color and viscosity.

The data presented in Table III reveal that color in a liquid has a tendency to increase the magnitude in error made in measurement, for example the average error for 100 cc of Distilled Water measured in a cylindrical graduate is 0.78%, while that of the green-colored liquid, Elixir of Iron, Quinine and Strychnine is 0.89%.

A similar effect was observed with respect to viscosity. In the case of Distilled Water the average error was 0.78% as previously stated, whereas the average error found in the measurement of Syrup was 1.91%, and for Castor Oil was 4.49%.

The large error in the case of Castor Oil is no doubt due to the fact that the refractive index of Castor Oil is so near that of glass that the adherence of the oil to the sides of the graduate is not detected and not sufficient time is allowed by the dispenser for complete drainage.

Milk of Magnesia while not a liquid in the true sense of the word is nevertheless generally dispensed by volume rather than by weight, hence it must be measured. It was therefore included in this series of experiments. The comparatively large error found in this instance was no doubt due to the adherence of a considerable amount of the magnesium hydroxide to the inside of the glass graduate from which it was impossible to drain it, but could be readily seen. The average error amounted to 2.79% as compared with that of Distilled Water which was 0.78%.

The results of Table III are best summarized in Table IV.

TABLE IV—SUMMARY OF RESULTS PRESENTED IN TABLE III

Liquid to Be Measured	Volume Measured in Cc	Shape of Graduate Used	Average Weight in Gm	Standard Deviation in Gm	Number of Measurements Falling within			
					1 X S D	2 X S D	3 X S D	4 X S D or Over
Distilled Water	100	Cyl	98.240	0.767	83	12	3	2
Eli. I. Q. & S.	100	Cyl	104.049	0.926	79	14	5	2
Syrup	100	Cyl	124.298	2.368	69	25	6	0
Milk of Magnesia	100	Cyl	94.895	2.644	73	20	7	0
Castor Oil	100	Cyl	87.742	3.938	72	21	7	0
Distilled Water	100	Con	97.881	1.802	67	28	5	0
Eli. I. Q. & S.	100	Con	103.752	2.329	70	25	5	0
Syrup	100	Con	126.753	3.333	68	28	4	0
Milk of Magnesia	100	Con	95.254	3.151	65	30	5	0
Castor Oil	100	Con	87.017	5.087	70	24	6	0

To make it possible to compare the results given in Tables I and III with similar data that may have been published, but which have not been expressed in terms of the standard deviation, the per cent deviation from the average weight has been calculated and is given in Table V.

TABLE V—PERCENTAGE OF ERROR COMPUTED FROM DATA IN TABLES I AND III

Liquid to Be Measured	Volume Measured in Cc	Shape of Graduate Used	Average Weight in Gm	Number of Measurements Falling within										10% or More
				1%	2%	3%	4%	5%	6%	7%	8%	9%		
Distilled Water	10	Cyl	9 561	4	5	11	24	22	13	9	8	2	2	
Distilled Water	10	Con	9 606	11	9	19	14	14	11	7	5	6	4	
Distilled Water	25	Cyl	24 481	27	29	24	9	4	2	2	1	0	2	
Distilled Water	25	Con	23 904	13	9	18	16	10	13	7	6	4	4	
Distilled Water	50	Cyl	49 258	55	33	8	2	1	1					
Distilled Water	50	Con	48 758	29	23	30	7	6	4	1				
Distilled Water	100	Cyl	98 240	89	9	0	2							
Distilled Water	100	Con	97 881	38	34	18	7	3						
Eliv I Q & S	100	Cyl	104 049	82	12	5	1							
Eliv I Q & S	100	Con	103 752	38	26	18	9	7	2					
Syrup	100	Cyl	124 298	45	27	18	4	5	1					
Syrup	100	Con	126 753	30	18	24	14	9	4	1				
Milk of Magnesia	100	Cyl	94 895	30	26	18	9	7	6	4				
Milk of Magnesia	100	Con	95 254	29	20	12	12	11	7	7	2			
Castor Oil	100	Cyl	87 742	22	20	11	11	15	3	2	6	3	7	
Castor Oil	100	Con	87 017	19	10	17	13	4	7	9	3	5	13	

NOTE All percentages are calculated from the average weight 1% = 1% or less, 2% = from 1% plus to 2%, etc

For the purpose of comparison with previously published data it is also desirable to have information showing the percentage of the total measurements in which the error falls below certain magnitudes, the latter being expressed in terms of per cent The following table is intended to accomplish this purpose

TABLE VI—TABLE SHOWING THE MAXIMUM PER CENT OF ERROR IN 90% OF THE MEASUREMENTS RECORDED IN TABLE V

Shape of Graduate.	10 Cc.	Distilled Water 25 Cc.	Distilled Water 50 Cc.	100 Cc.	Eliv I Q & S 100 Cc.	Syrup 100 Cc.	Milk of Magnesia 100 Cc.	Castor Oil 100 Cc.
Cyl	8%	5%	3%	2%	2%	3%	5%	8%
Con	8%	8%	5%	3%	4%	5%	6%	10%

CONCLUSIONS

1 The factors largely responsible for the errors made by pharmacists in the measurement of specified volumes were found to be three in number These are in the order of their importance (1) The nature of the liquid to be measured, (2) the shape and size of the graduate used, and (3) the personal equation

The error due to the personal equation naturally cannot be predicted with any degree of accuracy as it depends entirely upon the idiosyncrasy of the individuals making the measurements In some instances it may far exceed one or both of the other two factors but in all of the measurements made in the foregoing series of tests it exceeded twice the standard deviation in less than 7 per cent of all cases

2 From the data obtained in the tests made it would seem that twice the standard deviation is a reasonable margin of error for the measurement of the volume of liquids A margin of this magnitude will permit the acceptance of the following

Shape of Graduate	10 Cc	Distilled Water		100 Cc	Elix I Q & S 100 Cc	Syrup 100 Cc.	Milk of Magnesia 100 Cc	Castor Oil 100 Cc
		25 Cc	50 Cc					
Cyl	97%	94%	96%	95%	93%	94%	93%	93%
Con	95%	98%	95%	95%	95%	96%	95%	94%

REFERENCES

- (1) Andrews, Marvin J, *Jour A Ph A*, 22, 755 and 838 (1933)
- (2) Andrews, Marvin J, *Ibid*, 23, 350 and 421 (1934)
- (3) Andrews, Marvin J, *Ibid*, 23 1003 (1934)
- (4) Andrews, Marvin J, *Ibid*, 23, 1117 and 1210 (1934)

UNITED STATES PATENTS GRANTED FOR MEDICINES DURING THE PIONEER YEARS OF THE PATENT OFFICE *

BY LYMAN F. KEBLER ¹

The word "patent" means open, not secret. A patent cannot be granted for a medicine of secret composition. The term "Patent Medicine" applied to a medicine of secret composition is a misnomer. The term in general conveys an erroneous impression. Many think that all proprietaries, foods and drugs, and medicines in package form, are of secret composition and consequently plain frauds. It is true that some outright medical frauds have been and still are perpetrated on the suffering sick. And this is true even in the case of a goodly number of medicines for which patents have been granted. Patenting a product does not preclude telling fairy tales about it. In fact, the therapeutic claims contained in the description of some of the patents for medicines are grossly false and fraudulent, as will be pointed out later.

SOME INTERESTING PHASES IN PATENTING MEDICINES

Secret medicines with their air of mysticism have held sway for the ages in all lands. The alchemistic era produced some of the most phony ideas in the matter of the philosopher's stone being a universal medicine and panacea. Secret medicines made marked advances during the time of iatrochemistry, when Paracelsus (1493-1541), with his *lapis infernales*, held sway, and John R. Glauber (1610-1770), the distinguished physician-chemist and discoverer of Glauber's salt, played such prominent parts. Glauber not only discovered the salt named after him but ascertained its medicinal virtues and sold it at a handsome profit under the name *sal mirabile*, for many years. It is claimed that he made a living selling secret medicines.

England set a precedent in granting patents to medicines. Among the earliest may be mentioned "Dr. Bateman's Pectoral Drops" (1726), "Dr. James' Fever Powder" (1747), "Ann Pike's Ointment for the Cure of Cutaneous Eruptions" (1760), and "Gale's Spa Elixir" (1782). The Ann Pike Ointment is probably one of the most glaring of frauds. It is a mixture of pomatum, lard, deer suet, calomel, Jesuits' bark, quicksilver, turpeth mineral, tutty powder, flowers of brimstone and "wood sut." The patent alleges that it is a "Grand Antidote for the Itch and All

* Section on Historical Pharmacy, A. Ph. A. Washington meeting, 1934.

¹ Former Chief of Drug Division, Bureau of Chemistry, United States Department of Agriculture.

Scorbutic Humors, a Sovereign and Efficacious Remedy that never fails all Erruptions and Cutaneous Disorders " The manner of use is to rub a quantity the size of a pea, every night for a fortnight in the palms of the hands

In 1641 the General Court of Massachusetts Bay granted a 10 year patent for a novel method of making salt The same province granted a patent for life for an invention for warming houses Maryland issued a patent for a steam carriage in 1787 I have not come across a patent issued in favor of any medicine by any Colonial Government It should be said, however, that secret medicines were freely sold in the colonies, among them Gov John Winthrop's "Rubila," "Muirson's Mercurial Ointment" and "Digby's Sympathetic Powder" The latter had the sanction of Harvard College

The colonists brought with them a demand for the remedies of their home country The English Patent Medicines were as commonly used as laudanum and castor oil Their nature and character were generally well known

THE BEGINNING OF PATENTS IN THE UNITED STATES

Our National Constitution gives Congress the power to "Promote the progress of science and useful arts by securing, for a limited time, to authors and inventors, the exclusive right to their respective writings and discoveries" The first law under this provision was enacted April 10, 1790 It provided for a board consisting of the Secretaries of State and War, the Attorney-General and the President The Executive power was simply signatory The first board consisted of Thomas Jefferson, Secretary of State, Henry Knox, Secretary of War, and Edmund Randolph, Attorney-General The first United States patent granted was issued to Samuel Hopkins, July 31, 1790 It covers a process for the manufacture of "Pot and Pearlash" No copy is available The earliest patent, of which a copy is available and displayed in the patent office, was issued to Francis Bailey, January 29, 1791 It outlines methods for making punches, for manufacturing letters, and designs for printing The patent was signed by George Washington, the President, Thomas Jefferson and Edmund Randolph, Attorney-General No grant for any medicine was issued under the law of 1790

A new law was passed in 1793 Up to 1802 the clerk in the State Department handled all of the patent office work It is alleged that patents were granted for apparently trivial and ridiculous inventions In this connection it is interesting to note that the first United States patent, dealing with therapeutic matters, was issued in 1796 to Elisha Perkins, a physician of Connecticut Its title reads ¹ "Removing Pain, etc, by Metallic Points" The devices are usually referred to as "Perkins' Tractors,"² and are ridiculed as the acme of fraud Yet, some of the leading physicians of the times purchased and used them with apparent satisfaction There is no copy of this patent available in the United States, the reason being that a disastrous fire in 1836 destroyed the entire office, including the records, patents, drawings and designs Fortunately, Congress published Indexes from time to time, copies of which were filed elsewhere and were saved In these documents are preserved the titles of the patents issued

A patent for these tractors was granted³ in England to Benjamin Douglas Perkins, a son of Elisha Perkins, March 10, 1798, under the title, "Application of

¹ List of Patents Granted by the United States, 1790-1836

² Jour A Ph A, 22, 1142 (1933) ³ Specifications of Patents, England No 2221, 1798

Galvanism as a curative agent " The basis therefore was galvanism, that held such sway at the time The tractors most eminently efficacious for removing disease were claimed to be combinations of copper, zinc, with small proportions of iron, silver, gold or platinum The diseases enumerated, as most readily cured, are rheumatism, gout, pleurisy, inflammation, spasmodic affections and most topical complaints The patients were alleged to be cured by drawing these tractors over the parts affected, or contiguous thereto

A patent for "Bilious Pills" was granted in 1796, to Samuel Lee, Jr Four additional patents were issued, for pills, to four different persons in the nineties No copies are available The "Federal Index of Patents, United States Patent Office 1790 to 1873," by M D Leggett, Commissioner of Patents, is the most complete and satisfactory, of all consulted

The year 1836 is an outstanding one for the Patent Office, in a number of respects A new law was passed The numbering of patents was begun The first numbered patent is dated, July 13, 1836 The new law had not been in operation six months when the disastrous fire, referred to above, occurred, December 15, 1836 Congress shortly thereafter made provisions to restore the records as far as possible, and to have suitable quarters built for the work The old patents actually restored are extremely fragmentary, but they contain practically all of the available data on the subject, excepting that found in the Patent Indexes referred to above

During the period from 1790 to the new order of things in 1836, about seventy-five patents were granted covering Pills, Medicines, Ointments and Salves This means less than two patents a year, but the majority were issued during the last half of the period Most of the drugs were listed simply as medicines, but a fair proportion are more definitely characterized, as is indicated by the following

Name of Medicine	Date	Patentee	Name of Medicine	Date	Patentee
Removing Pain Etc by			Ointment	1816	William Judkins
Metallic Points	1796	Elisha Perkins	Medicine for Toothache	1817	J Utley
Bilious Pills	1796	Samuel Lee Jr	Antibilious Medicine	1817	J J Girard
Antibilious Pills	1797	Benjamin Duval	Elixir of Life	1817	Jules Rucco
Pills	1798	Samuel Cooley	*Liquid Magnesia Process	1818	J Cullen
Pills	1799	John Hawkes	Family Pills	1820	David Coit
Bilious Pills	1799	Samuel H P Lee	Medicine	1820	Lorenzo Dow
Bitters Jaundice	1801	J Wheaton	Anti dyspeptic Pills	1821	George Smith
Antibilious Pills	1802	Thomas H Raunson	Anti-dysenteric Medicine	1821	John G Vought
Antibilious Cordial	1802	Simon Lazarus	Medicine	1822	John Prentiss
Vegetable Elixir	1803	Samuel Cooley	Anti dyspeptic Pills	1822	C M Brockway
Antibilious Pills	1803	Thomas H Raunson	Medicine	1823	Samuel Thompson
Family Pills	1803	Daniel Coit	Medicine for Scrofula	1824	Gideon Jaques
Antiseptic Gas	1803	J C M Picornell	Consumption Pharma		
Canker Drops	1804	S Chamberlaine	ceutic	1825	John C Bay
Bilious Cordial	1804	S Chamberlaine	Tincture for Curing Corns	1826	Elisha Smith
Rheumatic Pills	1805	George B Dexter	Composition for Scurvy	1827	James U Armour
Essence of Tansey	1806	I Newton	Liquid for Preventing		
Vermifuge Preparation	1807	Jos Lehman	Scurvy	1827	W Armore
Galvanism for Salivation	1807	William Phoebeus	Medicine for Dysentery		
Cure for a Mad Dog Bite	1809	W Story	and Dyspepsia	1828	T Powell
Medicine for Scrofula and			Rheumatic Pills	1828	Ezre Deane
Cancer	1810	E Willard	Cough Drops	1828	Daniel E Smith
Bilious Pills	1810	Samuel Lee	Medicine	1828	Fitzgerald Bird
Consumption Medicine	1812	C S Long	Medicine	1828	John Dent
Febrifuge	1812	A Johnson	Toothache Specific	1829	Samuel Pennington
Restorative Elixir	1812	Harvey Frank	Chemical Catholicon	1830	I W Smith
Fever Medicine	1813	S Thompson	Blister Plaster	1830	Elisha Perkins
Bilious Pills	1814	Samuel H P Lee	Medicine for Dropsy and		
Rheumatic Pills	1814	Ezra Deane	Epilepsy	1831	J S Fall
Canker Drops Medicine	1814	David Halbreck	Medicine for Gout and		
Cancer Medicine	1816	J Andrus	Rheumatism	1831	A Parker
Syphilis Cure	1816	J Mosher	Medicine for Cholera	1832	J Houck
Syphilis Cure	1816	C T Jackson			

* A copy each of the patents for the medicines starred above, will be found in the "Restored Patent" volumes in the Patent Office Library They are all in longhand The John Cullen process patent for "Liquid Magnesia" granted May 4 1818 is the earliest of the patents restored for medicines

Scorbutic Humors, a Sovereign and Efficacious Remedy that never fails all Errup-tions and Cutaneous Disorders " The manner of use is to rub a quantity the size of a pea, every night for a fortnight in the palms of the hands

In 1641 the General Court of Massachusetts Bay granted a 10-year patent for a novel method of making salt The same province granted a patent for life for an invention for warming houses Maryland issued a patent for a steam carriage in 1787 I have not come across a patent issued in favor of any medicine by any Colonial Government It should be said, however, that secret medicines were freely sold in the colonies, among them Gov John Winthrop's "Rubila," "Muirson's Mercurial Ointment" and "Digby's Sympathetic Powder" The latter had the sanction of Harvard College

The colonists brought with them a demand for the remedies of their home country The English Patent Medicines were as commonly used as laudanum and castor oil Their nature and character were generally well known

THE BEGINNING OF PATENTS IN THE UNITED STATES

Our National Constitution gives Congress the power to "Promote the progress of science and useful arts by securing, for a limited time, to authors and inventors, the exclusive right to their respective writings and discoveries" The first law under this provision was enacted April 10, 1790 It provided for a board consisting of the Secretaries of State and War, the Attorney-General and the President The Executive power was simply signatory The first board consisted of Thomas Jefferson, Secretary of State, Henry Knox, Secretary of War, and Edmund Randolph, Attorney-General The first United States patent granted was issued to Samuel Hopkins, July 31, 1790 It covers a process for the manufacture of "Pot and Pearlash" No copy is available The earliest patent, of which a copy is available and displayed in the patent office, was issued to Francis Bailey, January 29, 1791 It outlines methods for making punches, for manufacturing letters, and designs for printing The patent was signed by George Washington, the President, Thomas Jefferson and Edmund Randolph, Attorney-General No grant for any medicine was issued under the law of 1790

A new law was passed in 1793 Up to 1802 the clerk in the State Department handled all of the patent office work It is alleged that patents were granted for apparently trivial and ridiculous inventions In this connection it is interesting to note that the first United States patent, dealing with therapeutic matters, was issued in 1796 to Elisha Perkins, a physician of Connecticut Its title reads ¹ "Removing Pain, etc, by Metallic Points" The devices are usually referred to as "Perkins' Tractors,"² and are ridiculed as the acme of fraud Yet, some of the leading physicians of the times purchased and used them with apparent satisfaction There is no copy of this patent available in the United States, the reason being that a disastrous fire in 1836 destroyed the entire office, including the records, patents, drawings and designs Fortunately, Congress published Indexes from time to time, copies of which were filed elsewhere and were saved In these documents are preserved the titles of the patents issued

A patent for these tractors was granted³ in England to Benjamin Douglas Perkins, a son of Elisha Perkins, March 10, 1798, under the title, "Application of

¹ List of Patents Granted by the United States, 1790-1836

² Jour A Ph A, 22, 1142 (1933) ³ Specifications of Patents England No 2221, 1798

Galvanism as a curative agent " The basis therefore was galvanism, that held such sway at the time The tractors most eminently efficacious for removing disease were claimed to be combinations of copper, zinc, with small proportions of iron, silver, gold or platinum The diseases enumerated, as most readily cured, are rheumatism, gout, pleurisy, inflammation, spasmodic affections and most topical complaints The patients were alleged to be cured by drawing these tractors over the parts affected, or contiguous thereto

A patent for "Bilious Pills" was granted in 1796, to Samuel Lee, Jr Four additional patents were issued, for pills, to four different persons in the nineties No copies are available The "Federal Index of Patents, United States Patent Office 1790 to 1873," by M D Leggett, Commissioner of Patents, is the most complete and satisfactory, of all consulted

The year 1836 is an outstanding one for the Patent Office, in a number of respects A new law was passed The numbering of patents was begun The first numbered patent is dated, July 13, 1836 The new law had not been in operation six months when the disastrous fire, referred to above, occurred, December 15, 1836 Congress shortly thereafter made provisions to restore the records as far as possible, and to have suitable quarters built for the work The old patents actually restored are extremely fragmentary, but they contain practically all of the available data on the subject, excepting that found in the Patent Indexes referred to above

During the period from 1790 to the new order of things in 1836, about seventy-five patents were granted covering Pills, Medicines, Ointments and Salves This means less than two patents a year, but the majority were issued during the last half of the period Most of the drugs were listed simply as medicines, but a fair proportion are more definitely characterized, as is indicated by the following

Name of Medicine	Date	Patentee	Name of Medicine	Date	Patentee
Removing Pain Etc by			Ointment	1816	William Judkins
Metallic Points	1796	Elisha Perkins	Medicine for Toothache	1817	J Utley
Bilious Pills	1796	Samuel Lee Jr	Antibilious Medicine	1817	J J Girard
Antibilious Pills	1797	Benjamin Duval	Elixir of Life	1817	Jules Rucco
Pills	1798	Samuel Cooley	*Liquid Magnesia Process	1818	J Cullen
Pills	1799	John Hawkes	Family Pills	1820	David Coit
Bilious Pills	1799	Samuel H P Lee	Medicine	1820	Lorenzo Dow
Bitters Jaundice	1801	J Wheaton	Anti dyspeptic Pills	1821	George Smith
Antibilious Pills	1802	Thomas H Rauson	Anti dysenteric Medicine	1821	John G Vought
Antibilious Cordial	1802	Simon Lazarus	Medicine	1822	John Prentiss
Vegetable Elixir	1803	Samuel Cooley	Anti-dyspeptic Pills	1822	C M Brockway
Antibilious Pills	1803	Thomas H Rauson	Medicine	1823	Samuel Thompson
Family Pills	1803	Daniel Coit	Medicine for Scrofula	1824	Gideon Jaques
Antiseptic Gas	1803	J C M Picornell	Consumption Pharma		
Canker Drops	1804	S Chamberlaine	cutic	1825	John C Bay
Bilious Cordial	1804	S Chamberlaine	Tincture for Curing Corns	1825	Elisha Smith
Rheumatic Pills	1805	George B Dexter	Composition for Scurvy	1827	James U Armour
Essence of Tansey	1806	I Newton	Liquid for Preventing		
Vermifuge Preparation	1807	Jos Lehman	Scurvy	1827	W Armore
Galvanism for Salvation	1807	William Phoebeus	Medicine for Dysentery		
Cure for a Mad Dog Bite	1809	W Story	and Dyspepsia	1828	T Powell
Medicine for Scrofula and			Rheumatic Pills	1828	Ezre Deane
Cancer	1810	E Willard	Cough Drops	1828	Daniel E Smith
Bilious Pills	1810	Samuel Lee	Medicine	1828	Fitzgerald Bird
Consumption Medicine	1812	C S Long	Medicine	1828	John Dent
Febrifuge	1812	A Johnson	Toothache Specific	1829	Samuel Pennington
Restorative Elixir	1812	Harvey Frink	Chemical Catholicon	1830	I W Smith
Fever Medicine	1813	S Thompson	Blister Plaster	1830	Elisha Perkins
Bilious Pills	1814	Samuel H P Lee	Medicine for Dropsy and		
Rheumatic Pills	1814	Ezra Deane	Epilepsy	1831	J S Fall
Canker Drops Medicine	1814	David Halbreck	Medicine for Gout and		
Cancer Medicine	1816	J Andrus	Rheumatism	1831	A Parker
Syphilis Cure	1816	J Mosher	Medicine for Cholera	1832	J Houck
Syphilis Cure	1816	C T Jackson			

* A copy each of the patents for the medicines starred above will be found in the "Restored Patent" volumes, in the Patent Office Library They are all in longband The John Cullen process patent for "Liquid Magnesia," granted May 4 1818 is the earliest of the patents restored for medicines

THE DEPARTMENT OF THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY

C B JORDAN—CHAIRMAN OF EXECUTIVE COMMITTEE, A A C P, EDITOR OF THIS
DEPARTMENT

Food, drug and cosmetic legislation seems to be at a standstill at the time this note is written. Our efforts to secure the needed provision to protect the consumer under present conditions have been blocked by interested parties whose activity would be curtailed if the proposed bill becomes a law. Public sentiment should be aroused to the point where Congress will have to recognize it. We have no objection whatever to a revision of S B 5 provided the revision is for the best interests of the consumer and also reasonable from the standpoint of the manufacturer and distributor. We are however opposed to revisions that will nullify the bill. Ralph W. Clark of the University of Wisconsin along with many others has been active in bringing this bill to the attention of the retail pharmacists and the public. The following radio address by Dr. Clark is a sane presentation of the situation.—C B JORDAN *Editor*

NATIONAL FOOD AND DRUG LEGISLATION *

BY RALPH W. CLARK **

Our social order has entered a period of accelerating change. Notwithstanding this fact, the attempt last year represents the first far-reaching effort since 1906 to augment the legal safeguards of the consumers of foods, drugs and cosmetics.

In a simple agricultural society the problem of the supply of these commodities devolves, more or less, upon every family. In the present industrial society a large proportion of the population is entirely dependent upon the general market. There is, therefore, a need for more stringent regulation of foods and drugs and the inclusion of cosmetics and advertising which are not mentioned in the 1906 Food and Drugs Act.

The first step in food and drug legislation was taken in 1850 when a law was passed which classified various kinds of tea. One year later the AMERICAN PHARMACEUTICAL ASSOCIATION was organized "to improve and regulate the drug market by preventing the importation of inferior, adulterated and deteriorated drugs and by detecting and exposing home adulterations." This organization, as well as the American Association of Colleges of Pharmacy, the National Association of Boards of Pharmacy, the National Association of Retail Druggists, and the Wisconsin Pharmaceutical Association, favors the present bill, the essential points of which will be outlined shortly. Last year, due to a misunderstanding, pharmacists were classed as opponents to the bill. They did oppose some portions of it which they thought were unreasonable and which have since been modified. They favor the present legislation as they have in the past favored desirable legislation which had to do with public health.

From 1879 to 1906, when the present Food and Drugs Act was passed, 190 measures were presented in Congress which were designed in some way to protect the consumer. Very little active interest in favor of such legislation as well as powerful opposition thereto resulted in only eight of these measures becoming laws.

* Radio Station WHA Home Maker's Hour—May 15 1935

** Instructor in Pharmacy, University of Wisconsin, Chairman, Inter-Professional Relationship Committee, Wisconsin Pharmaceutical Association

When the fight, just before 1906, was at its height, the name of Dr Harvey W Wiley was associated with various newspapers and magazines in exposing many existing evils and urging legislation to correct them. How different is the situation now when newspapers, magazines and radio are not favoring, but in many cases opposing this legislation, at least by not bringing information on it before the public. It is encouraging to have read early this year in the *Nation* and the *Milwaukee Journal* comments favorable to the proposed legislation. *Time*, however, recently made somewhat of a joke over the fact that the present Copeland Bill had been indefinitely postponed.

Credit should be given to the book, "100,000,000 Guinea Pigs," for stirring up an interest in the need for this type of legislation. Its authors, however, in writing the book, a best seller a year or two ago, and in operating Consumer's Research, are no less financially interested than manufacturers of foods, drugs and cosmetics. Many of the statements made are radical to say the least and should not influence the consumer too much. After all, it is home operation of an electric refrigerator or car and not laboratory tests that decides the value of the product. Certainly most manufacturers, the ones who intend to stay in business, undertake to market a product only after assuming the responsibility that their product is of high enough quality to be safe for consumer use and will be what they claim it to be when the consumer uses it for the purpose for which it is intended.

For the past few years, however, there has been a rapidly growing public recognition of the need for a revision of the Law of 1906 to better control the unscrupulous manufacturer. Court decisions have revealed weaknesses in the measure that were not foreseen when it was enacted, yet few substantial alterations of the existing Law have been made. In June 1933, Senator Copeland introduced a bill, S 1944, known as the Tugwell Bill, intended to strengthen and extend the Federal Food and Drugs Act of 1906. A storm of protest arose against the bill and it was twice revised, first as S 2000 and later as S 2800. Although the bill was reported favorably by a sub-committee of the Committee on Commerce, it was not acted upon in the last Congress because of the brief time between its favorable report and adjournment, because of the press of other legislative matters and because the revisions had not served to allay powerful opposition from some elements of the regulated industries.

Since the last session of Congress Senator Copeland has spent much time in revising and perfecting the measure which was introduced into this session as S 5 and is now popularly called the Copeland Bill. Following hearings held in March 1935, the bill was again favorably reported to the Senate. The provisions which aroused most opposition have been rejected. Chief among them was the one giving the Secretary of Agriculture extensive power in rule-making. The Secretary must, in the revision, which at the moment has been indefinitely postponed, consult the proper advisory committee, one on Food and one on Public Health, to be appointed by the President, and have its majority vote before establishing any regulations for the enforcement of the Act.

The bill now contains the valuable features of the present law. Its principal differences from the present law lie in the elimination of those provisions whose terms have caused courts to make interpretations that have afforded avenues for escape for the unscrupulous, extension of its provisions to cosmetics and advertis-

ing, amplification and reinforcement of certain provisions to safeguard public health and to promote honesty and fair dealing, and to strengthen its procedural provisions better to effectuate its purpose

The Copeland Bill contains definitions of foods, drugs and cosmetics which are broad. There has been no difficulty experienced with the definition of a food, but the term drug has now been made broad enough to include mechanical devices, while the definition of the term cosmetic is inclusive enough to embrace all substances, other than ordinary toilet or household soap, intended for cleansing or altering the appearance of, or promoting the attractiveness of the person. The bill prohibits labeling of foods, drugs and cosmetics in any manner which is false or misleading in any particular and every label must bear the name and place of business of the manufacturer. The latter inclusion is intended to prevent the sale of commodities under labels which remain silent with respect to the sponsorship of the products, or which utilize merely fictitious names, and to establish responsibility for statements used in advertising. The language of the bill is designed to prevent the use of claims of misleading breadth and to require, in the case of drugs, that all representation be limited to the actual value of the drug. In general, misbranding is designed to apply to all misrepresentation of whatever kind, whether of origin, identity, quality, effect or other description of property.

The definitions of standards in the bill are broad and delegation of power to make further regulations such as may become necessary are provided for in the manner previously mentioned. Adulterated is the term applied to products to which substances have been added which are in themselves harmful. An adulterated food, drug or cosmetic is, therefore, one which contains a substance which may render it dangerous to health under the conditions prescribed for its use. Certain color and other tolerances are set up and still others may be promulgated by the Secretary with the approval of the proper advisory committee.

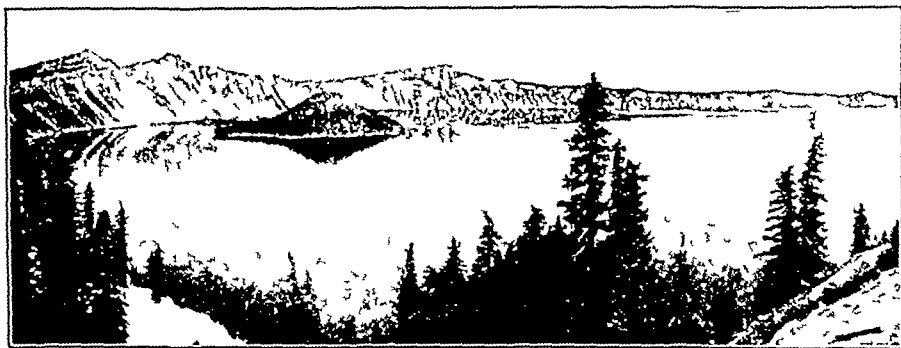
Advertising, as you all know from seeing and hearing it, needs considerable attention. Much of it is based upon the motive of fear—fear that one will lose his position unless he sleeps on a certain kind of mattress or drinks a certain kind of coffee, fear that he will be ostracized from society if certain mouth washes are not used to purify his breath, fear that a child will not be well if he is not given certain beverages and food—all these and many more call to mind specific advertising seen and heard regularly. This sort of thing I hope and believe will be cleared up if the Copeland Bill becomes a law. It should be remembered, too, that half-truths are more pernicious than falsehoods. The bill requires that statements used on the package, in the newspaper, in the magazine, and on the radio, must be statements of fact when the product is used as specified. If, for instance, the word antiseptic is used in describing a product, it must meet the test required in the bill for an antiseptic under the conditions indicated.

I have two small children at home. It is irritating to me to read or hear advertising stating that I am experimenting with them unless I use certain products for appetite-stimulators or for the treatment of colds and other so-called minor ills. I know full well that I really am experimenting unless they are seen regularly, whether sick or well, by a physician who has the training, the experience and the apparatus to check up on their general condition, and, in the case of colds, to listen to their lungs and inspect their ears and throats.

It should be pointed out that the manufacturer who is interested is treated fairly in that he may ask and receive a court review of the regulations handed down by the Secretary of the Department of Agriculture. The Act, by the way, should be administered in this department, rather than by the Federal Trade Commission, as proposed in certain other bills on this subject before this session of Congress. The Federal Trade Commission is regularly occupied in issuing cease and desist orders for unfair trade practices and not in deciding what products are good for the public health.

In conclusion let me quote from *The Milwaukee Journal* editorial "In general the Copeland Bill is right, and it would result in more effective protection to the public than does the present law." It is therefore necessary for you home-makers to take an active interest in securing the passage of the Copeland Bill. As I have said before, this bill¹ has now been indefinitely postponed but may be brought up again at any time. The present attempt is in danger of again not becoming a law and the much-needed legislation will be successful only if sufficient consumer interest can be aroused.

¹ The Copeland Bill (Federal Food, Drugs and Cosmetic Act) was passed by Senate, May 28, 1935, and referred to Interstate and Foreign Commerce, May 31, 1935.



Crater Lake, in Crater Lake National Park, is known as one of the "Seven Wonders of the World."

Crater Lake in Crater Lake National Park is considered one of the wonders of the world. To one historically minded, Oregon has an extra charm. The winning of the Pacific Northwest—the states of Oregon, Washington, Montana, Idaho and Wyoming—is a story with Oregon its focal center. It was at Champoege, a little spot on the Willamette 30 miles above Portland, that a provisional government of the Oregon country under the Stars and Stripes was declared on May 2, 1843. At the mouth of the Columbia River a hundred miles from Portland lies Astoria, the first settlement in Oregon, founded by John Jacob Astor in 1811, a community that fell to the British in the War of 1812 and was recovered six years later. A few miles beyond lies Seaside, where Lewis and Clark reached the end of the trail. Just across the Columbia from Portland stand Vancouver Barracks where General Grant and others of his day served as lieutenants and captains. Monuments, statues and shrines mark these places.

The world-famed Columbia River Highway starts eastward through the wondrous gorge of the Columbia from the very edge of Portland. An hour's drive carries you to some of the greatest scenic spots on this magnificent drive to the Vista House perched on the top of a mighty cliff some 700 feet straight above the great river where you may look out over a vast stretch of Oregon and of Washington lying just across the stream, to Multnomah Falls leaping down a sheer 625 feet in a roaring, mystic white. Words are futile in describing the magnificence, the awe inspiring grandeur of this highway hewn out of the towering rock-walled gorge which the river cut through the Cascade mountain in endless centuries of toil.

PROCEEDINGS OF THE LOCAL BRANCHES

"All papers presented to the Association and Branches shall become the property of the Association with the understanding that they are not to be published in any other publication prior to their publication in those of the Association, except with the consent of the Council"—Part of Chapter VI, Article VI of the By Laws

ARTICLE III of Chapter VII reads "The objects and aims of local branches of this Association shall be the same as set forth in ARTICLE I of the Constitution of this body, *and the acts of local branches shall in no way commit or bind this Association and can only serve as recommendations to it* And no local branch shall enact any article of Constitution or By-Law to conflict with the Constitution or By-Laws of this Association "

ARTICLE IV of Chapter VII reads "Each local branch having not less than 50 dues paid members of the Association, holding not less than six meetings annually with an attendance of not less than 9 members at each meeting, and the proceedings of which shall have been submitted to the JOURNAL for publication, may elect one representative to the House of Delegates "

Reports of the meeting of the Local Branches shall be mailed to the Editor on the day following the meeting, if possible Minutes should be typewritten with wide spaces between the lines Care should be taken to give proper names correctly and manuscript should be signed by the reporter

CHICAGO

The last monthly meeting of the Chicago Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION for the school year of 1934-1935 was held May 14th at the University of Illinois College of Pharmacy The speaker of the evening was Dr Frank B Kirby of the Abbott Laboratories

The 'Kirby Group Plan' was presented by President Webster The plan has as its aim monthly meetings that will interest the retail druggists The meeting time would be divided into definite periods with definite topics and would last in the neighborhood of two and one half hours

A lively discussion followed the presentation of the plan and the group present voted to accept the offer of Dr Kirby to send a copy of the plan to the members of the Branch so as to get the opinions of those interested in the plan as to whether such an organization should be started in Chicago

Dr Kirby was presented, and discussed "Diseases of the Head "

The discussion was divided into three subdivisions namely (1) The Eye, (2) The Nose and (3) Hay Fever

The Eye—Dr Kirby stated that the pharmacist should be in a position to render the eye specialist some kind of special service As a suggestion, the stock in the store pertaining to eye medication could be arranged in special shelving Then the druggist could pose as catering to this special field The necessary equipment should be obtained to properly fill this type of prescription and signs should be displayed giving the impression that you are paying particular attention to the filling of prescriptions involving the eye

You are now in a position to make a personal call on the eye specialists It was suggested that at least six specialists and a population of 200,000 is needed before a special department should be established

Twenty of these departments have been established in stores through the help of Dr Kirby

The Nose—Dr Kirby made a plea for professional recognition of colds in the head Large companies have been making intensive surveys of the loss of time by employees due to colds in the head No one has come along with a specific for colds in the head

It was suggested that a professional window, depicting that the physician can render aid where common remedies fail be displayed Part of the window space can call attention to bacterins These are injected by the physician but indirectly create good will with that profession A minor part of the display can be devoted to vitamin A making mention of the reasons why it should be taken during the seasons when colds are easily acquired

Hay Fever—Two million people suffer annually from hay fever in this country

Two opportunities await those dispensing hay fever medicines First, there is the pre

ventive medicine that is appreciated by the sufferers and one may start treatment prior to August 15th, say about the middle of June

In many cases known sufferers may go through the entire season with relief if they take injections of the correct pollen extract before the air becomes contaminated with it

About 10% of the suffering comes from hay, mainly timothy, and sometimes blue grass About August 15th, the chief offender, the ragweed, comes along

A suggestion was made that a ragweed be placed in the window as very few people know what it looks like Show how pollens are marketed, the syringes, and a chart showing the pollen content of your territory These charts are easily obtained

Such a window was placed in a Chicago loop drug store and attracted so much attention that it was left in for a much longer period of time than had originally been planned

During the first part of August a curative window should be displayed There will now be new victims and those sufferers who did not take the June treatment The display will be of a remedial nature and should show sprays, nasal douches ephedrine preparations eye preparations and vitamin A products A full grown ragweed could be shown with blue glazed glass or blue glazed paper below which will show the pollen as it falls from the plant These windows are known to have given results according to Dr Kirby The meeting was closed with an open discussion and with a rising vote of thanks to Dr Kirby for his interesting discussion

LAWRENCE TEMPLETON, *Secretary*

NEW YORK

The May 1935 meeting of the New York Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held on May 13th, in the College of Pharmacy of Columbia University, New York About thirty members and their guests attended Dr Charles W Ballard presided, the minutes of the previous meeting were read and approved Treasurer Currens reported a balance on hand

Chairman Lehman of the Committee on Education and Legislation then reported as follows

"Fair Trade Stabilization has lost a valuable friend and ally in the accidental death of Clyde Kelly, former congressman from Pennsylvania

The Copeland Food and Drug Bill S 5 It will be several weeks before this measure may come up Rumor has it that a compromise has been effected and that the bill will come up in an amended form

American Retail Federation Recent press release announces the formation of this super-trade organization, which is supposed to represent over one million retailers in the United States, the Executive Committee of the organization consists of

"Louis Kirstein Department store operator in Boston, George M Gales of Liggett & Co , C W Kress, Five and Ten Cent Stores, F Lazarus, Jr department store operator in Columbus, Ohio, A H Morrill, of the Kroger Grocery & Bakery Chain, Samuel Robinson of American Stores, Lessing Rosenwald of Sears, Roebuck & Co , E C Sams, of J C Penney Co , H J Tilly of the Retailers National Council

"General Johnson on April 18th asked How much voice is the little fellow going to have in such an organization?"

'An investigation of this Retail Federation has been authorized by unanimous vote of the House of Representatives and is being conducted under the chairmanship of Congressman Cochran of Missouri and six other members, including Congressman Cole of New York Pharmacists and others are asked to write to the chairman of the Committee stressing the need of statutory protection by small business men against monopolistic tendencies in distribution

'The New York State Prophylactic Bill (Stewart Bill) was signed by Governor Lehman, on May 9th and is now a law

"The Fair Trade Bill was passed by the Senate some time ago, and during the last days of the Legislative session by an enormous majority in the Assembly but so far has not been signed by the Governor

"An organization favoring Price Stabilization of Trade Marked merchandise is the Allied Retailers Association consisting of

'The New York State Pharmaceutical Association The New York State Retail Food Merchants, The New York State Retail Meat Dealers The New York State Retail Jewelers, The New

York State Retail Liquor Package Dealers, The Paint Dealers Protective Association, the Retail Dealers of America, representing 174,000 retail outlets in the State of New York.

"A meeting of this organization will be held at the Hotel Pennsylvania in the interest of the adoption of the Feld Crawford Fair Trade Bill, on the date of Wednesday evening, May 15th. Every local organization affiliated with the N Y Pharmaceutical Association is entitled to one official delegate to this meeting.

"From Bruce Philips Bulletin we see that the 'Medical Society of Greater New York (?)' is seriously discussing the question of a standardized home and office visit charge by the physician to the needy in that section. Suggested fees to be \$1 00 for office and \$2 00 for house visits.

"It is suggested that physicians at the same time should consider economies in the matter of prescription writing, and call for U S P and N F Remedies, instead of expensive proprietaries.

"The New Booklet of the U S P and N F Propaganda Committee of the New York State Pharmaceutical Association, under the chairmanship of our member J Leon Lascoff, is now ready for distribution. The book contains information for the physician about official preparations, their strength, dosage and therapeutic value also a large number of suggested prescriptions 50+ pages, price 25¢ per copy.

"Alcohol regulations permitting the sale at wholesale of alcohol in containers of two or more gallons have gone into effect. Those pharmacists in N Y State who have a \$1 00 license can only purchase in containers as designated.

"Seizures and dismantling of stores violating the federal alcohol laws have been moderated so as to provide a hearing for the accused before indulging in the drastic action heretofore exercised by the officials."

In view of the fact that since the meeting the NRA has been declared unconstitutional all references to NRA and code provisions have been omitted from Mr Lehman's report.

A letter from Samuel Hilton, Remington Medalist for 1935 was read. This letter brought on a discussion concerning the actual presentation of the medal. In this discussion Dr Schaefer, Mr Currens and Dr Newcomb took part. It was finally moved and approved that the secretary and the Executive Committee would be empowered to arrange for the presentation either in Washington or in New York City, according to Dr Hilton's wishes. In the event that the presentation would take place in New York City the program would be patterned after the procedure followed at the time of the Remington Medal presentation to Dr E F Kelly.

President Ballard appointed Samuel C Henry and Mr Fred C A Schaefer to act as Branch delegates at Delegates' meetings of the New York Pharmaceutical Council. Professor Otto Canis, of Fordham University, and Mr Jacob Seley were appointed to act as alternates. In connection with this Dr Schaefer suggested that the report of the Council Delegates be made a regular part of the Branch meeting program from now on.

Dr Ballard then introduced the speaker for the evening, Dr Robert P Fischelis, president of the AMERICAN PHARMACEUTICAL ASSOCIATION, whose address was entitled "The A P H A — Shall It Remain a Symbol or Shall It Become a Living Thing?"

Dr Fischelis began his address by pointing out that for nearly eighty-three years the pharmacists of the United States have looked up to the A P H A as the personification of everything they would like pharmacy to represent in the highest and most professional sense. In spite of this the membership represents less than three per cent of the pharmacists of the United States. He emphasized the fact that the ASSOCIATION remains something distant and hazy in the minds of most pharmacists from a strictly practical sense.

In more recent years developments in pharmacy have forced pharmacists to consider relations and to question all things and have focused attention upon the men and things responsible for the conditions which surround every phase of our profession and industry. In attacking these various problems they have evolved new units in American pharmacy to grapple with the various problems. In the meantime the A P H A instead of making use of its power to assist in the evolution of American pharmacy has calmly sat by and permitted new organizations to come into being. In this sense it has completely failed to assume the responsibilities which it justly should have and has even encouraged and fostered the growth of new organizations to handle specific problems. It is the argument of Dr Fischelis that this is a great pity, for it has permitted a decentralization of power in American pharmacy with various groups pulling in different directions.

He pointed out particularly that the original organization as set up of the A P H A was

such that no changes would be necessary in order to assume the various responsibilities, both professional and economic, which confront the industry. It is his opinion that in their conservatism the leaders of the ASSOCIATION have leaned over backwards.

In calling attention to some of the problems which the ASSOCIATION should rightfully have handled, Dr. Fischelis cited that in many instances the good name and prestige of the A. P. H. A. had been used by numerous organizations as a means of furthering their program and gaining wider recognition. He stated that every single one of these organizations which has endeavored to capitalize on the prestige of the A. P. H. A. always has capitalized on objectives, to which the A. P. H. A. could have and should have directed its attention, if it had been a living thing and not merely a symbol.

In criticizing the ASSOCIATION for failure to assume its rightful place in American pharmacy Dr. Fischelis stated that both inertia and the force of reactionary elements within the ASSOCIATION were responsible for the inactivity.

Before proposing a remedy the speaker carefully explained the present set up of the ASSOCIATION and pointed out how provision was actually already there for assuming leadership in both the professional and economic fields of the industry. He went on to explain how a closer tie up could be arranged between the State Association, the A. P. H. A., the N. A. R. D. and the local A. P. H. A. Branches which would make it possible for a single membership fee to provide adequate revenue for these various units. With such a set-up organizations like the Drug Institute would be wholly superfluous and it was Dr. Fischelis' opinion that if the large sum of money collected on behalf of that organization had been poured into such a set-up it would have been more productive of results since no salaries up to twenty-five thousand dollars a year would need to be paid.

In closing, Dr. Fischelis called attention to the power and unity represented in the medical field by the American Medical Association and the influence which this organization wields over advertising in the pharmaceutical field as well as physicians.

In the discussion which followed, A. W. Pauley of the Drug Center of St. Louis stated that he believed that the Drug Institute filled a place which other organizations could not. He claimed that individual associations had their own responsibilities and that the present set up might better continue. He was particularly interested in calling attention to the Retail Federation which he claimed could easily destroy the independent retail druggist and called upon every retail unit to fight this new movement.

C. V. Michaels, of the Drug Institute, very briefly called attention to some of the work being done by the Institute and pointed out that this body had contributed something in awakening other organizations to their respective responsibilities.

Secretary Newcomb, of the New York Wholesale Druggists Association, believed that a furthering of the activities of the AMERICAN PHARMACEUTICAL ASSOCIATION would weaken the professional standing of that organization. He pointed out that in reality, two kinds of drug stores were making their appearance, one a strictly professional and ethical prescription pharmacy and the other a miniature department store. He believed that the AMERICAN PHARMACEUTICAL ASSOCIATION would best fill its place in American pharmacy by retaining its active interest in the professional and scientific side and not by entering into the business field.

President David I. Cohen, of the New Jersey State Pharmaceutical Association, claimed that more active workers were needed in the field and that the industry required consolidating of its various forces.

Dean H. V. Army pointed out that the AMERICAN PHARMACEUTICAL ASSOCIATION was an extremely conservative pharmacy organization and had in more recent times broadened its interests. He also stated that the House of Delegates had failed to fully function. Referring to Dr. Fischelis' statements concerning the solidarity shown in other professional fields it was Dr. Army's opinion that this was not exactly true, and that the solidarity was not as great by any means as it appeared to be on the surface.

At the close of the discussion a rising vote of thanks was accorded the speaker and all those who took part in the discussion.

RUDOLF O. HAUCK, *Secretary*

PHILADELPHIA

The May meeting of the Philadelphia Branch, AMERICAN PHARMACEUTICAL ASSOCIATION was held May 21, 1935 at the Philadelphia College of Pharmacy and Science, President E H MacLaughlin in the chair

The speaker of the evening Dr Robert P Fischelis, president of the AMERICAN PHARMACEUTICAL ASSOCIATION, spoke on "The AMERICAN PHARMACEUTICAL ASSOCIATION and the Future of American Pharmacy" Dr Fischelis's speech was one of the most interesting heard during the past year He emphasized the pitfalls of American pharmacy and the need of whole hearted cooperation on the part of pharmacists throughout the United States, if they hoped to survive the great wave of influence which is tending to degrade pharmacy and to eliminate the individual pharmacist

He stressed the importance of the organization of pharmacists into one powerful cohesive group, pointing out that the AMERICAN PHARMACEUTICAL ASSOCIATION, with its present set-up, was able to cope with any major Pharmaceutical problem He emphasized the need of a new type A PH A JOURNAL—one that would hold interest and be helpful for the pharmacist as well as the scientist

A rising vote of thanks was given Dr Fischelis in appreciation of his most valuable talk

Respectfully submitted,

GEORGE E BYERS, *Secretary*

(Concluded on page 521)

A PHARMACEUTICAL STUDY OF p_H

BY FREDERICK F JOHNSON

(Concluded from page 412 May Journal A Ph A)

 p_H AND STABILITY OF GALENICAL PREPARATIONS

Digitalis Preparations—The question of p_H and digitalis stability has been a matter of controversy for many years and is far from settled at the present time Hintzelmann and Joachimoglu (89) stated that the tincture was most stable in an acid medium Emig (238) reported that tinctures prepared from menstruums of p_H 4.5–5.2 showed the least loss in potency although the initial potency was less than for normal tinctures Rowe and Scoville (248) stated that adjustment of the tinctures to p_H 4.0 with hydrochloric acid increased the stability and later stated (289) that tinctures of p_H 3.0 were more stable than those of p_H 6.0 or 7.0

In contrast to these results, Haag and Hatcher (127) reported that HCl decomposed constituents of digitalis, Wokes (187) reported that acidifying did not increase stability, Haag and Jarrett (206) reported that no definite relation existed between the activity of the tinctures and p_H , and Foster and Van Dyke (264) stated that the most stable tinctures were those of highest p_H

Hintzelmann and Joachimoglu (83), (42) reported that alkalinizing the tinctures with NaHCO_3 greatly increased deterioration, while Wokes (187) reported that the addition of Na_2CO_3 caused very little deterioration Joachimoglu and Bose (65) reported that the addition of tartaric acid increased the stability Rowe and Scoville (248) reported that the addition of hypophosphorous acid as a reducing agent was detrimental It seems to be definite that the addition of anhydrous sodium acetate or anhydrous sodium sulphate as antihydrolytic agents does result in increased stability (248), (289) (301)

Several investigators have reported that stability is increased by destroying the ferments of the crude drug or preparations by heat (95) (248) (289) Rowe and Scoville (289) reported that tinctures prepared from a 77% alcoholic menstruum were more stable than those prepared from an 87% menstruum, but Stasiak (329) claimed that absolute alcohol tinctures were more stable than 70% alcohol tinctures Macht and his co workers (88), (98), (99) stated that ultraviolet light and polarized light hastened destruction of the tinctures, but Bond and Gray (108) claimed that no destruction was produced by exposure to either light

There is plenty of evidence that the crude drug, tincture and infusion tend to become more acid during storage (92), (162) (214) Krantz (163), (274) has determined the buffer capacity of the tincture as 0.009 between p_H 5.75–2.50, and as 0.012 between p_H 5.75–9.50, 5.75 being the p_H of a U S P tincture He further stated (243) that the acids of the leaf are probably combined

with potassium and are extracted by the alcohol water mixture yielding a system having a high buffer capacity, consisting of a strong base combined with a weak acid, and also some slightly dissociated acid

Carr and Krantz (308), while investigating for the Revision Committee of the U S P XI, arrived at the following conclusions concerning the tincture of digitalis The official tincture has a pH of 5.50-6.00 Considering the manner of dosage, it is a stable product There is no distinct evidence that its stability can be increased by buffering or by adding acid to the product

Concerning infusions of digitalis, the consensus seems to be that preservative agents increase stability, that the infusions become more acid with age, and that a neutral infusion is most stable (77), (92), (214) The infusion is less acid than the tincture

Ergot Preparations—In 1926 an article in the *Public Health Reports* (79) stated

‘In order to insure the stability of the liquid extract, the hydrogen ion concentration should be adjusted within the limits represented by pH 4.0 and pH 5.0 The extract should be sterilized and sealed in ampules of non-alkaline resistant glass ’

The pH of the U S P Fluidextract of Ergot is approximately 4.5 In the last few years there has been a great variety of opinions concerning the efficacy of further reductions of the pH The confusion in the literature is augmented by the undependable results of the various assay methods

Six investigators have concluded that adjusting the pH to about 3.0 favors stability of the fluidextract and the alkaloid solutions (138), (188), (229), (247), (288) (306) These workers disagreed, however, concerning which acid was most effective Powell and his co workers (247) favored tartaric acid, Rowe and Scoville (288) favored reducing acids and Bernerowna (306) claimed that phosphoric acid was best Swanson (250) stated that a pH of 3.0 appeared to favor stability of the fluidextract, hypodermic solutions of ergot, and alcoholic solutions of ergotamine tartrate, but that the results were very questionable and no conclusions could be drawn Three investigators (227), (269), (294) reported that lowering the pH either did not increase stability or resulted in even more decomposition

Smith and Stohlman (227) reported that the addition of 2.5% sodium thiosulphate or 2.5% sodium hyposulphite or 1% cysteine hydrochloride as reducing agents to the fluidextract or alkaloid solutions favored stability if above pH 5.0 Bartsch (191) claimed that ergotamine tartrate was most stable at pH 2.04 Bernerowna (306) stated that of the various salts of the ergot alkaloids, the organic salts were most stable, and the sulphuric acid salts were more stable than the hydrochloric acid salts Wokes and Elphick (188) claimed that for proper extraction of ergot, the pH of the menstruum must be not less than 5.4

Aconite Preparations—The attempts to stabilize aconite preparations by adjusting the hydrogen-ion concentration have been quite successful Swanson (64), (69), (105) performed the original work and recommended that the pH values of the tinctures and fluidextracts be adjusted between pH 2.5-3.00 Without addition of acid the pH of the U S P tincture lies between 5.1-5.6 By lowering the pH , Swanson was able to decrease the deterioration from 90% to 5% He pointed to the discrepancies in the assay methods as deterioration increases The chemical assay at no time showed any loss of potency, the guinea pig and white mice methods were concordant for standard preparations but the difference between the two increased as deterioration progressed

Haag and Hawkins (155) thoroughly verified the results of Swanson Baker (304) also agreed with Swanson and established the optimum pH range for all aconite preparations as pH 2.3-3.0 He recommended the use of hydrochloric acid rather than a reducing acid like hypophosphorous acid He also reported that all of the tinctures became decidedly less acid during storage The only disagreement to the established optimum pH range was put forward by Munch and Pratt (282) who claimed that adjusting the pH to 2.5-3.10 did not increase the stability of the tincture or fluidextract

Carr and Krantz (308) recommended to the Revision Committee of the U S P XI the adoption of the pH range 2.5-3.0 for Tincture of Aconite It was reported that if the tincture is acid to methyl orange and shows an orange color with thymol blue, it will be within the stable pH range Carr and Krantz reported the buffer capacity of Tincture of Aconite as 0.0086 in the acid range This is very close to the buffer capacity of Tincture of Digitalis which is 0.0090

Miscellaneous Vegetable Preparations—Krantz and Slama (97) reported that the precipitation in the Compound Tincture of Gentian could be minimized by adjusting the reaction to pH

70 The official tincture has a p_H of 5.2 The precipitate was composed of starch, gentian sugars and albuminous material Begun (120) found that by exposing the crude gentian to hot alcohol vapors, the hydrolysis and inversion of gentian sugars and glucosides were considerably reduced

Swanson and Hargreaves (118) (182) have studied the effect of the hydrogen ion concentration upon veratrum, gelsemium and nux vomica preparations The optimum p_H for both the fluidextract and the tincture of veratrum was between p_H 4.3-4.8 The p_H of the U S P IX fluidextract is 5.0 and of the U S P X tincture, 5.4 The N F Fluidextract of Gelsemium of p_H 3.45 was stable and remained so when the p_H was reduced to 1.0 The N F Fluidextract of Nux Vomica of p_H 5.30 was stable and remained that way when the p_H was reduced to 0.75

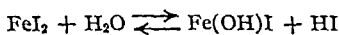
Lichtin (215) reported that acidifying the menstruum or percolate of Tincture of Cinchona did not increase stability Caines and Evers (260) have reported concerning the loss of color in mixtures containing the B P Compound Tincture of Cardamon From p_H 7.0-9.5 the mixtures were stable in the dark but fading occurred in the dark at higher p_H values Calcium salts caused precipitation of calcium carminate at p_H 4.0 and above

Scoville (103) has studied the effect of acid upon the precipitation in many of the less important tinctures The acid increased precipitation of red cinchona, aloë, frangula, juglans, rhu barb, senna, rhus glabra, quercus, wild cherry and stilingia It retarded precipitation of cinchona calisaya, castanea, geranium and rose Sodium acetate retarded precipitation of aloë, frangula, scna, chionanthus, glycyrrhiza, salix nigra and senega It seemed that the tannin-containing drugs were especially prone to precipitation by hydrolytic action Krantz (162) reported that Fluidextract of Cascara becomes slightly more acid upon standing and that Elixir of Iron, Quinine and Strychnine becomes much less acid upon standing irrespective of the type of light to which they are exposed

Turner (230) stated that the syrup and mucilage of acacia rapidly decompose because of the development of acidity Attempts to produce acid free preparations by heat sterilization and the use of preservatives were unsuccessful Eschenbrenner (199) has reported that infusions of ipecac can be stabilized if prepared with dilute hydrochloric acid and 15% alcohol This corresponds to the U S P acid fluidextract The p_H of Eschenbrenner's infusion was 4.5 Madsen (216) claimed that such an infusion was unstable and proposed a formula which produces an alcoholic infusion of p_H 3.6 This was claimed to be stable for three years

Conduche and Gregoire (148) have reported that in aromatic waters, both filtered and unfiltered, there was a diminution of acidity on keeping The p_H usually changed from about 3.8-7.0 The reduction of acidity was almost proportional to the amount of volatile oils which separated and was evidently a result of the removal of the volatile oils The reaction could best be stabilized by preventing the growth of microorganisms Krantz and Carr (164) have investigated the effects of different filtering mediums upon the reaction of Aromatic Elixir Using talc, as in the U S P preparation, the p_H values were between 7.00-7.35 Elixirs prepared with magnesium carbonate had p_H values from 9.10-9.80, with magnesite or normal magnesium carbonate the p_H was 6.8, and with precipitated calcium phosphate the p_H was between 5.95-6.30

Miscellaneous Chemical Preparations—Husa and Klotz (314), (315) have studied the mode of decomposition of Syrup of Ferrous Iodide During storage the p_H always dropped from 4.1 or above to 3.2 The hydrolysis predominated according to the equation



Two equilibria existed in the hydrolysis one at p_H 4.1 and the other at p_H 3.2 Precipitation occurred at p_H 3.2 Alkaline glass of the container retarded the hydrolysis It was shown by solubility product data that precipitation of Fe(OH)_3 cannot occur in the syrup Ewe (200) reported that Syrup of Hydriodic Acid caramelized, due to excessive acidity Attempts to lower the acidity by reducing the proportion of hypophosphorous acid resulted in the appearance of free iodine in the syrup When the acidity was reduced by diluting the syrup with water until the sugar content was 35%, the syrup remained colorless for a year Husa and Magid (271) also reported that the decomposition of the Syrup of Hydriodic Acid increased with increasing hydrogen ion concentration Mercuric iodide, barium iodide, aluminum sulphate and calcium chloride caused a marked retardation of the decomposition of the syrup

Guyote (74) reported that a solution of arsenous iodide hydrolyzes to hydriodic acid which becomes oxidized to free iodine This was overcome by neutralizing the solution with sodium

hydroxide, thus converting the arsenous iodide to an arsenite. The arsenite solution appeared to be stable. Knight (112) criticized the U S P Fowler's Solution, claiming that 2% of potassium bicarbonate causes an unnecessary increase in alkalinity. He stated that 1% of potassium bicarbonate would be sufficient. Smelt (293) recommended that the B P Fowler's Solution be adjusted to a p_H less than 4.0. The growth of molds was favored between p_H 5.0-7.8, and precipitation occurred between p_H 4-9. The acid solution was favored because of greater compatibility.

Donovan's Solution can be sufficiently stabilized by adjusting the p_H to neutrality. The U S P preparation is very acid, due to the hydrolysis of the arsenous iodide. Cocking (122) and Husa (160) both showed that the hydrolysis of dilute arsenous iodide is complete, the p_H of tenth normal solutions of arsenous iodide and hydriodic acid being the same, 1.1. Duncan (14) first showed that the liberation of iodine from Donovan's Solution could be checked by neutralizing the free hydriodic acid. Husa (158), (241), (270) found that the p_H of Donovan's Solution was 1.2. There was no liberation of iodine when the p_H was adjusted to 6.0-8.0. He recommended the use of a carbonate as the neutralizing agent as it prevented oxidation by replacing the air with carbon dioxide.

Husa (272) stated that the stability of Solution of Iron and Ammonium Acetate was slightly increased when the acetic acid was omitted and the solution buffered with hydrochloric acid. Ammonium chloride and sodium chloride. Jones and Glass (161) reported that properly prepared Iron and Ammonium Citrate is a neutral substance of p_H of about 7.5. Its incompatibility with magnesium sulphate could not be correlated with any increase of p_H . Morton (168) stated that the commercial bismuth and ammonium citrate and the B P Solution of Bismuth and Ammonium Citrate are unsatisfactory preparations. The complex was stable only in the presence of an excess of alkali citrate. Kleinschmidt (212) claimed that the Solution of Magnesium Citrate would not precipitate if the citric acid content were reduced. Oakley and Krantz (246), however, decided that the precipitation was due to the conversion of a large amount of the magnesium acid citrate to the neutral salt, $Mg_3(C_6H_5O_7)_2$, and that the presence of an excess of citric acid would shift the equilibrium to the acid salt and favor stability.

Ëwe (200) reported that the fungous growths in the Acid Solution of Phosphates could be prevented by the addition of about 1% of concentrated hydrochloric acid and 0.4% formic acid. Ëwe further stated that the Compound Elixir of Glycerophosphates develops a precipitate within a few months. The precipitation was reduced by increasing the lactic acid content, and was completely corrected by substituting phosphoric acid instead.

Delay and Lee (262) found that samples of the official Elixir of Ferric Pyrophosphate, Quinine and Strychnine underwent a color change which was roughly proportional to a simultaneous increase in p_H . Those samples which were carefully neutralized in their preparation were most constant in p_H but the neutralization did not affect their stability.

Thompson and his co-workers (296) reported that the p_H values of Spirit of Ethyl Nitrite changed greatly during deterioration. The following are the p_H values of different samples corresponding to the ethyl nitrite content during 23 months' storage:

4.25% (fresh)	2.95%	1.54%	0.00%	0.00%
p_H 0.82	p_H 0.46	p_H 1.00	p_H 5.95	p_H 4.34

Davis (197), (198) reported the p_H of various hypochlorite preparations as follows: Dakin's Solution, p_H 9.71, Eusol, p_H 7.21, Daufresne's Solution, p_H 10.23, 1% Chloramine, p_H 10.05. Eusol decomposed more rapidly than the more alkaline Dakin's Solution. When Davis prepared mixtures of chlorinated lime, sodium carbonate and boric acid, p_H 9.53 was the lowest p_H value which could be obtained with stable preparations.

Noyes and Wilson (52) obtained evidence that hypochlorous acid ionizes in an amphoteric fashion, forming both positive and negative chlorine ions. They assumed the presence of two compounds, $H^+ ClO^-$ and $Cl^+ OH^-$. Lynch and Nodder (245) have published the most extensive data concerning the ionic condition of hypochlorite solutions. They included a method for calculating the displacement of the p_H of buffer solutions, due to the presence of sodium hypochlorite. The development of the glass electrode enabled Davidson (261) to accurately determine the dissociation constant of hypochlorous acid as 3.7×10^{-8} at 20° C. He reported that bleaching powder decomposed, forming oxalic and carbonic acids with an accompanying reduction of p_H . The more alkaline solutions decomposed the least, and decomposition was much less when the acids were removed as they were formed.

pH AND STABILITY OF ALKALOIDS

It has been shown that pH is an important factor in the stability of alkaloids during sterilization. It is obvious, also, that the pH of these solutions for injection must be stabilized to a value comparable to the pH of the blood. Trendelenburg (70), Schon (225), Regnier (285), (328), Schou (291), and Woelm (299) have pointed out the importance of buffering to the physiological pH solutions of morphine, cocaine, tutocaine and larocaine solutions which are intended for injection. This buffering is necessary not only to counteract the alkaline tendency of the glass containers but to prevent a spontaneous change in hydrogen ion concentration as a result of the decomposition of a small amount of the alkaloid.

Dietzel and Huss (111) studied the decomposition of morphine at high temperatures and at different pH values. The decomposition was detected by changes in the absorption spectrum. At pH values of less than 5.5, the morphine was stable for 60 minutes at 100° C. Neutral and alkaline solutions were very unstable. The free morphine was not any less stable than the morphine hydrochloride, the decomposition being due to oxidation by hydroxyl ion catalysis. It was found that alkaline glass caused decomposition at room temperature. Dietzel (311) verified his results in 1934 and again attributed the stability at reduced pH to catalytic neutrality. The pH of morphine hydrochloride and morphine sulphate solutions is about 4.0.

Cocaine also requires an acid medium for stability and undergoes a decrease in pH during storage and sterilization. Regnier and his co-workers (285) (286) demonstrated the change to acidity during storage and pointed out the dangers of the pharmacological use of such acid solutions. Macht and Anderson (98) and Macht and Krantz (99) reported that exposure to polarized light increased the hydrogen ion concentration of cocaine solutions. Dietzel and Steeger (263) reported that the hydrolysis of cocaine by heat was a minimum between pH 2-5. The type of glass container had a negligible effect. Schon and Helm (225) reported that the hydrolysis of benzoyl ecgonine was a minimum between pH 2-7. When they attempted to buffer cocaine solutions to the physiological pH , hydrolysis was accelerated unless the pH was as low as 3.4. A pure solution of cocaine hydrochloride changed in 2 months from pH 5.17 to 4.2 without any perceptible decomposition. One buffered to pH 6.05 showed 31% hydrolysis in the same time. Regnier and David (287) found that solutions buffered to neutrality by being saturated with calcium carbonate and magnesium carbonate retained their potency during sterilization but rapidly deteriorated afterward. Their anesthetic power was inferior to that of pure solutions of cocaine. Regnier and David (327), (328) later reported that solutions of cocaine buffered by NaH_2PO_4 almost completely deteriorated during sterilization but those buffered by acetic acid and sodium citrate retained their activity. Dietzel (311) reported that of the various cocaine salts, cocaine sulphate was most stable during the first 25 hours of heating. The pH of cocaine sulphate solutions is about 5.2.

Dietzel and Steeger (263) determined the dissociation constants for cocaine and its hydrolysis products. The results were as follows:

Cocaine	2.4×10^{-6}	
Methylecgonine	3.0×10^{-6}	
Benzoylecgonine	$\frac{(\text{benzoylecgonine}) (\text{OH}^-)}{(\text{benzoylecgonine})}$	1.9×10^{-12}
	$\frac{(\text{benzoylecgonine}) (\text{H}^+)}{(\text{benzoylecgonine})}$	1.8×10^{-18}
Ecgonine	$\frac{(\text{ecgonine}) (\text{OH}^-)}{(\text{ecgonine})}$	6.0×10^{-12}
	$\frac{(\text{ecgonine}) (\text{H}^+)}{(\text{ecgonine})}$	7.6×10^{-12}

The authors pointed out that in the choice of an acid to be combined with cocaine its dissociation constant must not be smaller than that of methylecgonine or cocaine, that is, not smaller than 10^{-6} . Otherwise the dissociation forms hydroxyl ions which promote hydrolysis by hydroxyl ion catalysis.

Abildgaard (190) reported that solutions of procaine hydrochloride in hydrochloric acid showed no appreciable decomposition when heated. Under the same conditions and in a pure water solution, 5% of the procaine hydrochloride was hydrolyzed, and, when buffered to a pH of 6.5, 19-35% was hydrolyzed. Wiedhopf (231) claimed that pantokain is very stable and can withstand several hours' boiling near the neutral point. An aqueous solution has a pH of 7.0 and a 1% solution in physiological salt solution has a pH of 6.7. Procaine was more easily hydrolyzed. Schou and Staggeimer (291) reported that tuteocaine, when heated to 120° C for 20 minutes, decomposed 24% at pH 7.0 and 12.2% at pH 6.5. Under the same conditions, larcocaine decomposed 20.9% at pH 7.0 and 11.4% at pH 6.5. The solutions were adjusted with phosphate buffers. Dietzel and Kuhl (310) reported that during storage of eucaine hydrochloride the pH dropped from 6.98 to 5.26 in 1 year with 39.7% decomposition. Heat sterilization or exposure to oxygen did not hasten the decomposition.

Schou and Bjerregaard (249) have studied the decomposition of atropine and homatropine solutions. Pure 0.4% aqueous atropine sulphate was sterilized for 20 minutes at 120° C with only 3.4% hydrolysis. Buffering to higher pH values caused greater loss. Pure 0.4% aqueous homatropine hydrobromide was less stable and decomposed 8.2% under the same conditions. Complete hydrolysis occurred at pH 7.3 and above.

Biddle and Watson (28) noted that changes in the hydrogen ion concentration caused a change in the ionic condition of the cinchona alkaloids. Dietzel and Sollner (149) have elaborated on this work. They stated that in the water-soluble salts of quinine, quinidine and cinchonidine, the nitrogen of the quinuchidine ring is ionized while the nitrogen of the quinoline ring is not. In the presence of an excess of acid, the latter nitrogen ionizes and forms salts. With decreasing pH there was in each case an increase of optical rotation which paralleled the ionization of the quinoline nitrogen. Macht and Anderson (99) reported that quinine and cinchonidine salts decreased in toxicity upon exposure to polarized light.

Dietzel (311) reported that hydrastine decomposed very rapidly at 100° C but that hydrastinine showed very little change. Decomposition of berberine was very slight and evidently was not altered by an increase in hydrogen-ion concentration.

Gifford and Smith (265) reported that physostigmine and pilocarpine decomposed more rapidly in an alkaline buffer solution of pH 7.6 than in an acid buffer solution of pH 5.5.

pH AND STABILITY OF MISCELLANEOUS ORGANIC COMPOUNDS

Nielson (284) reported that the decomposition of sodium luminal increased with increasing pH . A 10% solution has a pH of about 8.9. A 10% solution decomposed 1.0% in 3 weeks at room temperature and 22% in 1 month at 39° C. Madsen (319) reported that the decomposition of sodium barbital also increased with increasing pH . A 10% solution has a pH of 8.9; the decomposition was accompanied by a decrease in pH . Sixty minutes at 100° C caused 2.5% decomposition of the sodium barbital with the formation of diethylacetylurea.

Kolthoff (128) claimed that the decomposition of a thiosulphate with acid was due to the formation of the undissociated thiosulphuric acid which is unstable. Schou and Bennekou (290) stated that sodium thiosulphate solutions could be sterilized without decomposition only when the pH was 7.0. The solutions were adjusted by phosphate buffers.

Macht and Shohl (37) have published data concerning the decomposition of benzyl alcohol solutions. Solutions stored in insoluble glass were stable over long periods of time but showed a slight increase in hydrogen ion concentration. Solutions stored in soft or alkaline glass quickly became alkaline and rapidly deteriorated. The deterioration was evidently an oxidation process. The authors claimed that the oxidation was hastened by neutralizing the benzoic acid which was formed. It was recommended that solutions of benzyl alcohol be sealed in hard glass containers with the addition of a buffer to keep the pH between 6.8-7.0.

Nijhoff and Van Oort (171) found that urotropin solutions could not be sterilized by boiling because of decomposition into ammonia and formic acid. The type of glass did not influence the decomposition. The authors recommended that urotropin be sterilized by tyndallization after the addition of 2% of sodium bicarbonate.

Levy and Cullen (36) found that the autoclaving of strophanthin solutions changed the reaction from pH 6.0 to pH 9.0. This increase in pH greatly reduced the biological action of strophanthin. Autoclaving at pH 5.0 caused only 2% deterioration. Haag and Hatcher (127) have

also demonstrated the alkaline instability of strophanthin. They reported that ouabain solutions slowly decomposed in ampuls of hard glass.

Dubrisay and Emschwiller (237) have completed a thorough study of the decomposition of iodoform. Iodoform in solution was oxidized by light with the formation of iodine and hydriodic acid, which, in turn, accelerated further oxidation. Other mineral acids promoted oxidation, whether in the light or dark. Oxidation was the slowest with ether, carbon disulphide or toluene as the solvent. Very small amounts of phenol or hydroquinone retarded the oxidation.

Lindholm (276) reported that hydrogen peroxide solutions were stabilized by the addition of any one of the following: acetanilid, quinine hydrochloride, urea, methyl parahydroxybenzoate, acetphenetidin, oxalic acid and iodine. A 3% peroxide solution was stabilized by 0.04% iodine for 5 years.

Pertaining to the stabilization of phenol, Vergez (252) stated that a solution containing 20 Gm. of phenol, 8 Gm. of crystalline boric acid and 1000 cc. of water remained unchanged for 18 months.

In 1929, Smith and his co-workers (136) reported the finding of large discrepancies in the pH values of commercial neoarsphenamine. The values ranged from pH 5.80-8.74. Upon dilution, some samples increased in pH and others decreased.

GENERAL PRINCIPLES CONCERNING pH AND STABILITY

Much work has been performed which, at the present time, has little practical application in the stabilizing of drugs. However, the results of these investigations have established certain fundamental principles which can broaden our conception concerning the mechanism of the ionic condition.

For instance, Koltzoff (128) has shown conclusively that ions which are in an adsorbed state possess reaction qualities different from those of free ions. If the ions of the reacting substance are adsorbed upon some stratum, the reaction is greatly retarded and, if the ions of a product of a reaction are adsorbed, the reaction is greatly accelerated. In his experiments the ions were adsorbed upon charcoal.

Kiehl and Hansen (84) have investigated the ionization during the hydration of pyrophosphates. By the use of reference curves obtained by making hydrogen ion concentration measurements on synthetic solutions and plotting the molar concentrations of hydrogen ions against the molar concentrations of disodium orthophosphate, each hydration was followed to completion by hydrogen-ion concentration measurements. The hydrogen ion concentration decreased progressively with time, reaching a final fixed value as complete conversion to the orthophosphate occurred. This fact indicates that pyrophosphoric acid produces more hydrogen ions than does orthophosphoric acid and, consequently, that the withdrawal of hydrogen ions will displace the reaction toward the pyro acid.

Buchanan and Barsky (144) reported that the rate of polymerization of cyanamide is a function of the hydrogen ion concentration, the velocity of the reaction being greatest at pH 9.6 and decreasing rapidly above and below this point. Between pH 6-10 the polymer alone (param or cyanquandine) was formed. Between pH 10-12 both the polymer and urea were formed. Above pH 12 no polymerization occurred and only urea was formed. Zappi and Williams (255) noted also that there was an optimum pH in the region of 9.5 for the polymerization of aldehydes. Zappi's article was also of interest concerning the effect of pH upon the concentrations of the tautomeric forms of aldehydes.

Volfkovich (253) and Bryan (258), (259) have demonstrated the presence of a transition point at pH 4.3 between the two types of oxidation, addition of oxygen and hydrogen evolution. The hydrogen evolution occurred below pH 4.3. This was applied experimentally to iron salts and to sulphites.

Bolin (107) has determined a number of pH values for the maximum stability against hydrolysis of esters. The reactions occurred at 25° C. unless stated otherwise. His results indicate that esters are hydrolyzed by hydrogen- and hydroxyl ion catalysis. He drew the following conclusions: For esters of fatty acids, the optimum pH for a weak acid is lower than for a strong acid. For methyl esters, the optimum pH is lower than for the corresponding ethyl esters. Introduction of a phenyl group lowers the optimum pH and increases the ve-

locity of decomposition Bolin claimed that derivatives of secondary amines and similar compounds which are not prone to hydrolysis are most stable at pH 7.0

	pH		pH
Ethyl butyrate	5.65	Ethyl phenylacetate	4.9
Methyl benzoate	4.0 (80° C)	Ethyl acetoacetate	4.4
Ethyl benzoate	4.15 (80° C)	Ethyl alphachloropropionate	4.0
Phenyl acetate	4.1	Ethyl hippurate	4.4
Benzyl acetate	4.3	Methyl acetanilide	6.0

Olivier (134) claimed that the influence of the hydrogen-ion concentration upon hydrolysis is conditioned by the nature of the organic compound. Such an influence is absent in alkyl halides and acid chlorides, as well as in other compounds in which the water molecule, as such, may be expected to add directly. Olivier further stated that the concordant and regular influence of the substituents upon the hydrogen ion catalyzed hydrolysis of esters are best explained by the theories of induced alternating polarities of Lapworth, Kermak and Robinson. For further information concerning the reaction of different molecular structures to hydrogen ion catalysis the reader is referred to Olivier (321), (322), (323).

BIBLIOGRAPHY

- (1) Helmholtz H V 1881 *J Chem Soc* 39
- (2) Arrhenius Svante 1887 *Z physik Chem* 1, 631
- (3) Nernst W 1889 *Ibid* 4 129
- (4) Arrhenius Svante 1890 *Ibid* 5 1
- (5) Ostwald W 1893 *Ibid* 11 521
- (6) Wjys J A 1893 *Ibid* 12 514
- (7) Nernst W 1894 *Ibid* 14 155
- (8) Kohlrausch F and Heydweiller A 1895 *Ann physik Chem* 53 209
- (9) Bugarszky S and Liebermann L 1898 *Arch ges Physiol* 72 51
- (10) Peters R 1898 *Z physik Chem* 26 193
- (11) Arrhenius Svante 1899 *Ibid* 31, 197
- (12) Crotono, F 1900 *Z anorg allgem Chem* 24 225
- (13) Euler Hans 1900 *Z physik Chem* 32 348
- (14) Duncan William 1903 *Pharm J* (1903), 586 Through *Proc. A Ph A*, 51 631
- (15) Salecky, W 1904 *Z Elektrochem* 10 204
- (16) Salm E 1906 *Z physik Chem* 57 471
- (17) Fitzgerald E and Lapworth A 1908 *J Lond Chem Soc* 93 2163
- (18) Lapworth A 1908 *Ibid* 93 2187
- (19) Haber F and Klemensiewicz 1909 *Z physik Chem* 67 385
- (20) Lewis G N and Sargent, L W 1909 *J Am Chem Soc*, 31 362
- (21) Sorensen S P L 1909 *Biochem Z* 21 131
- (22) Goldschmidt Heinrich 1909 *Z Elektrochem* 15 4
- (23) Michaelis, L and Davidsohn H 1911 *Biochem Z* 35 386
- (24) Dawson, H M and Powis F 1913 *J Lond Chem Soc* 103 2135
- (25) Hildebrand J H 1913 *J Am Chem Soc* 35 847
- (26) Steegitz Julius 1913 *Ibid* 35 1774
- (27) Dawson H M and Powis F 1914 *J Lond Chem Soc* 105 1093
- (28) Biddle, H C and Watson Thomas 1917 *J Am Chem Soc* 39 968
- (29) Clark W M and Lubs H A 1917 *J Bact* 2 1 109 191
- (30) Harkins 1917 *J Am Chem Soc* 39 354
- (31) Lewis G N Brighton T B and Sebastian R L 1917 *J Am Chem Soc* 39 2245
- (32) Dudley H W 1919 *J Pharmacol Exp Ther* 14 295
- (33) Loeb Jacques 1919 *J Gen Physiol* 1 717
- (34) Thomas Arthur W and Baldwin M E 1919 *J Am Chem Soc* 41 1981
- (35) Abel John J and Nagayama T 1920 *J Pharmacol Exp Ther* 15 347
- (36) Levy Robert L and Cullen G E 1920 *J Exp Med* 31 267
- (37) Macht, David I and Shohl A. T 1920 *J Pharmacol Exp Ther* 16 61
- (38) Northrop John H 1920 *J Gen Physiol* 2 465
- (39) Builmann E *Ann chim* (9) 15 109
- (40) Builmann E and Lund H *Ibid* (9) 16 321
- (41) Crane Marian M *J Pharmacol Exp Ther* 18 319
- (42) Joachimoglu, G *Arch expil Path Pharm*, 91 156 Through *C A*, 16 3130
- (43) Kendall James *Proc Nat Acad Sci* 7 58
- (44) Kolthoff, I M *Pharm Weekbl* 58 961 Through *YEAR BOOK A Ph A* 10 305
- (45) Northrop John H *J Gen Physiol* 3 715
- (46) Bogue Robert H *J Physic Chem* 26 801
- (47) Cohen Barnett, *J Bact* 7 183
- (48) Corran J W and Lewis W C M *J Am Chem Soc* 44 1673
- (49) Fleisch Alfred *Arch expil Path Pharmacol* 94 22 Through *Chem Zentralbl* 93 1205
- (50) Kolthoff I M *Pharm Weekbl* 59 104 Through *YEAR BOOK A Ph A* 11 378
- (51) Northrop John H *J Gen Physiol* 5 263
- (52) Noyes William A and Wilson T A *J Am Chem Soc* 44 1630
- (53) Van Slyke D D *J Biol Chem* 42, 525
- (54) Williams John R and Swett M *J Am Med Assoc* 78 1024
- (55) Williams John R and Swett M *Proc Soc Expil Biol Med* 19 266
- (56) Builmann E *Trans Faraday Soc* 19 676
- (57) Joachimoglu G *Biochem Z* 134 489
- (58) Kolthoff I M *J Soc Chem Ind* 42 427A
- (59) Lewis G N and Randall M *Thermodynamics and the Free Energy of Chemical Substances* McGraw Hill Book Co N Y
- (60) Muscu, Peter and Moffat M I *Jour. A Ph A* 12 609
- (61) Rice F O *J Am Chem Soc* 45 2808
- (62) Robertson O H Woo S T and Sia H P *Proc Soc Expil Biol Med* 21 119
- (63) Smith R. B and Giesy P M *Jour A Ph A* 12 955
- (64) Swanson E E and Walters A L *Jour A Ph A* 12 957
- (65) Joachimoglu G and Bose P *Arch expil Path Pharmacol* 102 17 Through *C A*, 18 2787
- (66) Kuhn Richard and Sobotka H *Z physik Chem* 109 65
- (67) Northrop J H *J Gen Physiol* 1 6 317 11 7 603
- (68) Risch C *Biochem Z* 148 147

- (69) Swanson E E *Jour A Ph A* 13 1108
 (70) Trendelenburg Paul Oe P 90 276
 Through *Chem Zentralbl* 95 1060
 (71) Waterman H I and Kuiper P *Rec trav chim* 43 323 Through *C A* 18 2582

1925

- (72) Abt G and Loiseau G *Ann inst Pasteur* 39 114 Through *C A* 19 2511
 (73) Brownlee John *Biochem J* 19 377
 (74) Guyot R *Bull soc pharm Bordeaux* 63 217 Through *C A* 20 985
 (75) Johnston J H and Peard G T *Biochem J* 19 281
 (76) Kerridge P M T *Biochem J* 19 611
 (77) Plaut Research Lab (Lehn and Fink) *Am J Pharm* 97 456
 (78) Roy L *J Pharm chim* (8) 1 525

1926

- (79) Anonymous *Pub Health Rep* 41 505
 (80) Eggerth Arnold H *J Gen Physiol* 10 147
 (81) Geill Torben *Compt rend soc biol* 95 1219, and 1221 Through *C A* 22 250
 (82) Ghosh S and Dhar N R *J Phys Chem* 30 830
 (83) Hintzelmann and Joachimoglu *Arch expll Path Pharmacol* 112 56 Through *Yahresber Pharm* 61 233 and *Quart J Pharm Pharmacol* 3 215
 (84) Kiehl Samuel J and Hansen W C *J Am Chem Soc* 48 2802
 (85) Kraemer Elmer O *Colloid Symposium Monograph* 4 102
 (86) Krantz John C Jr and Gordon N E *Jour A Ph A* 15 83
 (87) Lepper E and Martin C J *Biochem J* 20 45
 (88) Macht D I and Krantz J C Jr *Proc Soc Expll Biol Med* 23 340
 (89) Sherman H C and Burton G W *J Biol Chem* 70 639
 (90) Stasiak A *J Pharmacol Exp Ther* 28, 1
 (91) Strom K. M *Nyt Mag Naturvidenskab* 64 109 Through *C A* 22 2729
 (92) Taunter M L *Jour A Ph A* 15 255
 (93) Vahlteich H W *Ibid* 15 193

1927

- (94) Hassan A and Drummond J *Biochem J* 21 653
 (95) Iselin Ernst *Pharm Acta Helv* 2 80
 (96) Koffler L and Lazar Z *Arch Pharm u Ber deut pharm Ges* 265 610
 (97) Krantz J C Jr and Slama F J *Jour A Ph A* 16 1166
 (98) Macht D I and Anderson W T Jr *J Am Chem Soc* 49 2017
 (99) Macht D I and Krantz J C Jr *Jour A Ph A* 16 106
 (100) Marrack J and Hewitt L F *Biochem J* 21 1129
 (101) Ringer W E and Grutterink B W Z *Physiol Chem* 164 112
 (102) Sadolin Erik *Dansk Tids Farm* 1 223 Through *C A* 21 1869
 (103) Scoville Wilbur L *Jour A Ph A* 16 1136
 (104) Smorodinzew J A and Danilow V A *Biochem Z* 181 149
 (105) Swanson E E and Hargreaves C C *Jour A Ph A* 16 296

1928

- (106) Behrens W U *Z anal Chem* 73 129
 (107) Bolin Ivan *Z anorg allgem Chem* 177 227
 (108) Bond W R and Gray E W *Quart J Pharm Pharmacol* 32 351
 (109) Bronsted J N *Trans Faraday Soc* 24 630
 (110) Clark W M The Determination of Hydrogen Ions 3rd edition page 36 Williams and Wilkins Co Baltimore Md
 (111) Dietzel R and Huss W *Arch Pharm u Ber deut pharm Ges* 266 641
 (112) Knight W A *Pharm J* 121 396
 (113) Krantz J C Jr and Gordon N E *Colloid Symposium Monograph* 6 173
 (114) Krogh A and Hemmingsen A *Biochem J* 22 1231
 (115) Malquori G *Gazz chim ital* 58 203 Through *Chem Zentralbl* 99 217

- (116) Mayeda Siebung *Biochem Z* 197 410
 (117) Northrop J H and Simms H S *J Gen Physiol* 12 313
 (118) Swanson E E and Hargreaves C C *Jour A Ph A* 17 22
 (119) Tschirch A and Fluck H *Pharm Acta Helv* 3 140

1929

- (120) Beguin M C *Pharm Acta Helv* 4 213
 (121) Chapin Robert M *J Am Chem Soc* 51 2112
 (122) Cocking T *Quart J Pharm Pharmacol* 2 409
 (123) Cornog J and Hershberger A *Proc Iowa Acad Sci* 36 264 Through *C A* 25 1146
 (124) Cruess W V and Richert P H *J Bact* 17, 363
 (125) Fluck H *Pharm Acta Helv* 4 58
 (126) Guha B and Drummond J *Biochem J* 23 880
 (127) Haag H B and Hatcher R A *J Am Med Assoc* 93 26
 (128) Kolthoff I M *Rec trav chim* 48 298 Through *C A* 23 2872
 (129) Krantz J C Jr *Jour A Ph A* 18 469
 (130) Krantz J C Jr and Gordon N E *Ibid* 18 797
 (131) Miller Edgar G *Biochem J* 23 876
 (132) Mulford H G and Greenbaum F R *Jour A Ph A* 18 564
 (133) Nasset F S and Greenberg D M *J Am Chem Soc* 51, 836
 (134) Olivier S C *J Chem Weekbl* 26 518 Through *C A* 24 1338
 (135) Reader Vera *Biochem J* 23 689
 (136) Smith R B *Jurist A E and Christiansen W G* *Jour A Ph A* 18 1142
 (137) Svedberg T and Heyroth F *J Am Chem Soc* 51 550
 (138) Swanson E E *Jour A Ph A* 18 1129
 (139) Temple J W *J Am Chem Soc* 51 1754
 (140) Van Winkle R and Christiansen W G *Jour A Ph A* 18 707
 (141) Williams Waterman and Gurin *J Biol Chem* 83 321

1930

- (142) Acree S F and Fawcett E H *Ind Eng Chem Analyt Ed* 2 78
 (143) Benda Louis U S 1758 425 May 13 Through *C A* 24 3326
 (144) Buchanan G H and Barsky G *J Am Chem Soc* 52 195
 (145) Chick H and Roscoe M *Biochem J* 24 101
 (146) Chick H and Copping A *Ibid* 24 932
 (147) Chick H and Copping A *Ibid* 24 1764
 (148) Conduche E and Gregoire F *Bull Sci Pharmacol* 37 529
 (149) Dietzel R and Soliner K *Arch Pharm u Ber deut pharm Ges* 268 629
 (150) Eddy and Gurin *J Biol Chem* 87 729
 (151) Fosdick L S H L Hansen and Dragstedt C A *Proc Soc Expll Biol Med* 27 529
 (152) Gaddum J H *Biochem J* 24 939
 (153) Gerlough T D *J Am Chem Soc* 52 824
 (154) Guerrant N B and Salmon W D *J Biol Chem* 89 199
 (155) Haag H B and Hawkins L W *Jour A Ph A* 19 1284
 (156) Hoen E and Chertkov L *Zentr Bact Parasitenk* 117 364 Through *C A* 24 5855
 (157) Hofmann E *Helv Chim Acta* 13 138
 (158) Husa W J and Enz W F *Jour A Ph A* 19 328
 (159) Husa W J *Ibid* 19 825
 (160) Husa W J *Ibid* 19 1287
 (161) Jones A J and Glass N *Quart J Pharm Pharmacol* 3 488
 (162) Krantz J C Jr and Carr C J *Jour A Ph A* 19 32
 (163) Krantz J C Jr *Ibid* 19 366
 (164) Krantz J C Jr and Carr C J *Ibid* 19 1095
 (165) Krantz J C Jr *Ibid* 19 1181
 (166) McGilivray Ivor *Biochem J* 24 891
 (167) Morris T N *Dept Sci Ind Research Rept of Food Investigation Board* (1930) 119 Through *C A* 25 4837
 (168) Morton C *Quart J Pharm Pharmacol* 3 561
 (169) Morton C *Ibid* 3 438
 (170) Narayanan B and Drummond J *Biochem J* 24 19

- (171) Nijhoff G H and Van Oort H D *Pharm Weekbl* 67 884 Through *Yahresber Pharm* 05 302 and *Quart J Pharm Pharmacol* 4 127
- (172) Pace James *Biochem J* 24 006
- (173) Pleass W B *Ibid* 24 1472
- (174) Remesow Igor *Biochem Z* 218 86
- (175) Schmidt S *Kgl Danske Videnskaps Selskab Biol Medd* 9 1 Through *C A* 25 3383
- (176) Schmidt S *Dansk Tids Farm* 4 173 Through *C A* 24 5855
- (177) Schmidt S *Z Immunitäts* 66 506
- (178) Sjogren B and Svedberg T *J Am Chem Soc* 52 5187
- (179) Smith E L *Quart J Pharm Pharmacol* 3 499
- (180) Svedberg T *Trans Faraday Soc* 26 740
- (181) Svedberg T and Sjogren, B *J Am Chem Soc* 52 2855
- (182) Swanson E E and Hargreaves C C *Jour A Ph A* 19 122
- (183) Thumann K V and Page A B *Biochem J* 24 1058
- (184) Thompson M R *Jour A Ph A* 19 705
- (185) Weeks I C *Physical Review* 35 668
- (186) Williams J and Corran J *Biochem J* 24 37
- (187) Wokes F *Quart J Pharm Pharmacol* 3 205
- (188) Wokes F and Elphick G K *Ibid* 3 599
- (189) Wokes F and Elphick G K *Ibid* 3 59
- 1931
- (190) Abildgaard, J *Dansk Tids Farm* 5 129 Through *Quart J Pharm Pharmacol* 4, 644
- (191) Bartsch O *Dansk Tids Farm* 5 172
- (192) Berg E *Pharm Zeit* 76 959 Through *YEAR BOOK A Ph A* 20 37
- (193) Bruck *Apoth Zeit* 40 994
- (194) Chapin R M *J Am Chem Soc* 53 912
- (195) Cruess W V Richert P H and Irish J H *Hilgardia* 6 295
- (196) Daniels T C and Lyons, R E *J Phys Chem* 35 2049
- (197) Davis H *Quart J Pharm Pharmacol* 4 360
- (198) Davis H *Pharm J* 127 81
- (199) Eschenbrenner H *Pharm Zeit* 76 694 Through *Yahresber Pharm* 66 236
- (200) Ewe G E *Jour A Ph A* 20 360
- (201) Freudenberg K D W and Eyer, H *Z physiol Chem* 202 128
- (202) Freudenberg K D W *Ibid* 202 159
- (203) Friedman L and Evans D N *J Am Chem Soc* 53 2898
- (204) Gerlough T D *J Pharmacol Exp Ther* 41 307
- (205) Guha B C *Biochem J* 25 945
- (206) Haag H B and Jarrett L E *Jour A Ph A* 20 474
- (207) Harada T *Ind Eng Chem Analyt Ed* 3 1
- (208) Hartley P *Lancet* 221 582
- (209) Hazel I and Sorum C H *J Am Chem Soc* 53 49
- (210) Jacobs M H and Parpart A K *Biol Bull* 60 95
- (211) Janistyn H *Seifensieder Zeit* 58 363
- (212) Klemschmidt F *Jour A Ph A* 20 47
- (213) Kordatzki W *Z f Untersuchung der Lebensmittel* 62 480
- (214) Krantz J C Jr *Arch Pharm u Ber deut pharm Ges* 269 470
- (215) Lichten A *Am J Pharm* 103 279
- (216) Madsen E H *Pharm Zeit* 76 901
- (217) Mattheus A O *Jour A Ph A* 20 767
- (218) Mogilsku A V *Byull Nauch Issledovatel Khim Farm Inst* (1931) 111 Through *C A* 27 5474
- (219) Morton C *Quart J Pharm Pharmacol* 4 1
- (220) Morton C *Ibid* 4 161
- (221) Morton C *Ibid* 4 451
- (222) Price T S *Phot J* 71 59
- (223) Rae A *Pharm J* 127 467
- (224) Rowe L W and Scoville W L *Jour A Ph A* 20 1030
- (225) Schon S A and Helm C *Dansk Tids Farm*, 5 1 Through *C A* 26 256 and *YEAR BOOK A Ph A* 20-21 166 and *Quart J Pharm Pharmacol* 4 541
- (226) Sjogren B and Svedberg T *J Am Chem Soc* 53 2657
- (227) Smith M I and Stohliman E F *J Pharmacol Exp Ther* 43 621
- (228) Taft R and Malm L E *J Phys Chem* 35 874
- (229) Thompson, M R *Jour A Ph A* 20 1027
- (230) Turner H A *Pharm J* 126 160
- (231) Wiedhopf O *Deuts Med Wschr* 53 13
- Through *Quart J Pharm Pharmacol* 4 159
- 1932
- (232) Aberhalden E and Buadze S *Fer mentforschung*, 13 363 Through *C A* 27 106
- (233) Bach S *Pharm J* 128 392
- (234) Barker J Evers N and Eastland C *Biochem J*, 26 2129
- (235) Bye M *Proceedings A D M A* (1932) 298
- (236) Cruess W V *J Ind Eng Chem* 24 648
- (237) Dubrissay R and Emschwiller G *Compt rend* 195 660 Through *YEAR BOOK A Ph A* 21 448
- (238) Emig H M *Jour A Ph A* 21 1273
- (239) Enz W W F and Jordan C B *Jour A Ph A* 21 34
- (240) Hering K. *Arch Pharm u Ber deut pharm Ges* 270 402
- (241) Husa W J *Jour A Ph A* 21 211
- (242) Krantz J C Jr and Carr C J *Jour A Ph A* 21 1291
- (243) Krantz J C Jr and Munch J C *Jour A Ph A* 21 16
- (244) Linsner H *Biochem Z* 244 157
- (245) Lynch L P and Nodder C R *J Textile Institute* 23 309T
- (246) Oakley M and Krantz J C Jr *Jour A Ph A* 21 132
- (247) Powell, C E Schulze and Swanson *Ibid* 21 1003
- (248) Rowe L W and Scoville W L *Ibid* 21 160
- (249) Schou S A and Bjerregaard P B *Dansk Tids Farm* 6, 185 Through *YEAR BOOK A Ph A* 21 477
- (250) Swanson E E Powell, Stevens and Stuart *Jour A Ph A*, 21 320
- (251) Tanko Bela *Biochem Z* 250 7
- (252) Vergez, G *Bull soc pharm Bordeaux* 2 144 Through *C A*, 27 2759
- (253) Volkovich S I and Belopolskii A P *J Applied Chem (U S S R)* 5 529 Through *C A* 27 35
- (254) Wilcox I V *Ind Eng Chem Analyt Ed* 4 38
- (255) Zappi E V and Williams A T *Bull Soc Chim* 51 1258
- 1933
- (256) Bedford M H Keller W H and Gabbard J L *J Am Chem Soc* 55 3953
- (257) Britton H T S and Dodd E *Trans Faraday Soc* 29 537
- (258) Bryan J M *Ibid* 29 830
- (259) Bryan J M *Ibid* 29 1198
- (260) Caines C M and Evers N *Quart J Pharm Pharmacol* 6 486
- (261) Davidson G F *J Textile Institute* 24 185T
- (262) Dekay H D and Lee C O *Jour A Ph A* 22 316
- (263) Dietzel R. and Steeger O *Arch Pharm u Ber deut pharm Ges* 271 521
- (264) Foster R H K. and Van Dyke H B *Jour A Ph A* 22 381
- (265) Gifford S R. and Denton S R *Arch Ophth* 9 227
- (266) Goldberg S D *U S* 1924 685 Through *C A* 27 5483
- (267) Haddock L A *Quart J Pharm Pharmacol* 6 496
- (268) Hansen S Schou and Tonnesen *Dansk Tids Farm* 7 26 Through *C A* 27 5146 and *Pharm Zentralbl* 75 443
- (269) Hersant E F. and Linnell W H *Pharm J* 131 3
- (270) Husa W J *Druggists Circular* 77 17
- (271) Husa W J and Magid Louis *Jour A Ph A* 22 278
- (272) Husa W J and Birmingham G W *Jour A Ph A* 22 495
- (273) Klobusitzky D *Kolloid Z* 62 98
- (274) Krantz J C Jr *Jour A Ph A* 22 106

- (275) Kunzmann T Z *Hyg Infektionskrankh*
114 623 Through C A 27 5899
- (276) Lindholm Farm Tidende (1933) 68
Through Pharm Zentralh 75 381
- (277) Loughlin W Biochem J 27 1779
- (278) Marshall P G Ibid 27 821
- (279) McBain J W and McClatchie W L J
Am Chem Soc 55 1315
- (280) Milne G R and Ratray G Pharm J
130 246
- (281) Morton C Quart J Pharm Pharmacol 6
492
- (282) Munch J C and Pratt H J Proceedings
A D M A (1933) 220
- (283) Murray D Biochem J 27 543
- (284) Nielsen L Dansk Tids Farm 7 137
Through Pharm Zentralh 75 352
- (285) Regnier J Liot and David Bull sci
pharmacol 40 271
- (286) Regnier J Liot and David Ibid 40 353
- (287) Regnier J and David Ibid 40 650
- (288) Rowe L W and Scoville W L Jour
A Ph A 22 938
- (289) Rowe L W and Scoville W L Ibid 22
1087
- (290) Schou S A and Bennekou I Dansk
Tids Farm 7 17 Through C A 27 5146
- (291) Schou S A and Staggemeier O M Dansk
Tids Farm 7 106 Through C A 27 5146 and
Pharm Zentralh 75 417
- (292) Schrel R J Immunol 25 183
- (293) Smelt E M Quart J Pharm Pharmacol
6 375
- (294) Swoap O F Cartland and Hart Jour
A Ph A 22 8
- (295) Taketomi N and Horikoshi T J Soc
Chem Ind Japan 36 187 Through C A 27 1933
- (296) Thompson M R Andrews and Ichniowski
Jour A Ph A 22 487
- (297) Walbum Dansk Tids Farm 7 37
Through Pharm Zentralh 75 433
- (298) Wintersteiner O J Biol Chem 102 473
- (299) Woelm Max U S 1916 089 Through
C A 27 4830
- (300) Woodward W A and Cowlan A N
Pharm J 131 132 and Quart J Pharm Pharmacol
6 363
- 1934
- (301) Anonymous Pharm J 132 111
- (302) Anonymous Drug and Cosmetic Ind 34
399
- (303) Baborovsky J Collection Czechoslov Chem
Communications 6 283 Through C A 28 6362
- (304) Baker W B Jour A Ph A 23 974
- (305) Bartole A Scienza farm 1 255 Through
C A 28 5299
- (306) Bernerowna M Wiadomosci Farm 61
169 and 207 Through C A 28 4839
- (307) Boutaric A and Morizot F Bull soc
chim (5) 1 153
- (308) Carr C J, and J C Krantz Jr Jour A
Ph A 23 50
- (309) Cocking T T Pharm J 132 110
- (310) Dietzel R and Kuhl G W Arch Pharm
u Ber deut pharm Ges 272 369
- (311) Dietzel R Pharm Zentral 75 469
- (312) Howland R B and Bernstein A Biol
Bull 66 276
- (313) Hurd C B Lawrence and Miller J Phys
Chem 38 663
- (314) Husa W J and Klotz L J Jour A Ph
A 23 679
- (315) Husa W J and Klotz L J Ibid 23 774
- (316) Jermstad A and Ostby O Arch Pharm
Chem 41 524
- (317) Krejci L and Svedberg T J Am Chem
Soc 56 1706
- (318) Laverne V Kissell and Couillault Compt
rend soc biol 116 160 Through C A 28 5085
- (319) Madsen C J T Dansk Tids Farm 8 62
Through C A 28 6520
- (320) Meyer Erich Drug and Cosmetic Ind 34
353
- (321) Olivier S C J, and Weber A Re trav
chim 53 889 Through C A 28 6121
- (322) Olivier S C J Rec trav chim, 53 891
Through C A 28 6122
- (323) Olivier S C J and Weber A P Rec
trav chim 53 899 Through C A 28 6122
- (324) Osborn T W B Biochem J 28 423
- (325) Peters A F and Osol A Jour A Ph A
23 197
- (326) Quartaroli A Gazz chim ital 64 243
- (327) Regnier J and David R Bull sci
pharmacol 41 321
- (328) Regnier J and David R Compt rend
soc biol 115 1195 Through C A 28 4175
- (329) Stasiak A Magyar Gyógyszeresztud Társag
Értesítője 10 384 Through C A 28 5177
- (330) Svedberg T and Quensel J Am Chem
Soc 56 1700
- (331) Svedberg T Naturwissenschaften 22 225
- (332) Walker J F Can 341 481 Through C
A 28 3831
- (333) Zakharova G H Kolloid Z 67 222

ASTRINGENT MOUTH WASH

(Zinc Chloride Type)

Zinc Chloride	2 0 Gm
Menthol	0 6 Gm
Oil of Cinnamon	1 4 cc
Oil of Clove	0 3 cc
Formaldehyde	0 4 cc
Saccharin	0 4 Gm
Alcohol	40 0 cc

Water q s ad 1000 0 cc

A mouth wash preferred by some who desire the astringent effect of a zinc salt

MOUTH RINSE No 1

Saccharin Soluble	0 10 Gm
Fuchsin, basic	0 02 Gm
Oil of Cinnamon	0 25 cc
Oil of Peppermint	0 25 cc
Oil of Clove	0 50 cc

Alcohol	300 00 cc
Talc	10 00 Gm

Distilled Water, q s 1000 00 cc

This makes a pleasant sweet spicy mouth rinse when diluted with 2-3 parts of water. No medication is intended in this formula. Especially suitable for the Spray Bottle

MOUTH RINSE No 2

Thymol	0 50 Gm
Menthol	1 00 Gm
Oil of Peppermint	3 00 cc
Alcohol	300 00 cc

Distilled Water, q s, 1000 00 cc
Color to suit

A pleasant mint-flavored mouth wash to be used diluted 2-3 times with water. Especially suitable for the Spray Bottle

ASSOCIATION BUSINESS

AD INTERIM BUSINESS OF THE COUNCIL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, 1934-1935

March 28 1935

Office of the Secretary, 2215 Constitution Avenue, Washington, D C

LETTER NO 15

To the Members of the Council

78 Committee on National Formulary Recently Mr Oliver A Farwell submitted his resignation as a member of the A P H A and as a member of the Committee on N F because of his retirement from active work.

The By Laws provide that "Whenever deemed advisable by the Council, it shall after the publication of each edition of the National Formulary, appoint a committee of 15 members from the general membership of the ASSOCIATION, which committee shall have charge of the revision of the Formulary This committee shall report annually, or as often as required, to the Council, and shall continue to serve for a term of ten years or until their successors are appointed Vacancies occurring in this committee shall be filled by the Council as quickly as is expedient "

The resignation was reported to Chairman Gathercoal of the Committee, and the following letter has been received from him

"As you informed me that Dr Oliver A Farwell has resigned from the National Formulary Committee and as the work of this Committee should actively continue during the years immediately ahead, I would offer the suggestion that one of the capable pharmacognosists of the United States be elected to the Committee to take the place occupied by Dr Farwell

"There are several very splendid and experienced men in the group of younger pharmacognosists who have been somewhat active as auxiliary members in the work of the present revision Among these, Dr E H Wirth has taken an unusually active part and has been of great assistance to me It gives me pleasure to recommend him as a nominee for this vacant place on the N F Committee "

If members of the Council desire to submit other nominees for the vacancy, they are requested to do so promptly

79 Honorarium for Editor of the Recipe Book I At a recent meeting of the Executive Committee of the Council and in connection with a vote to make an appropriation for the editing of the copy for Recipe Book II, Dr LaWall called attention to the fact that Professor Ivor Griffith had not been paid anything for his work as editor of the Recipe Book I \$1000 00 was appropriated for the editing of the Recipe Book I and this amount plus an added appropriation was expended for clerical and other assistance in the work

The following letter was received from Dr LaWall

"I wish to make a motion that inasmuch as Professor Ivor Griffith never received any remuneration for the long and arduous work of editing the manuscript for the first edition of the Recipe Book that he be paid an honorarium of \$500 for this service "

and the following letter from Dr James H Beal

"Returning from a trip North, I find your letter of inquiry regarding the proposed honorarium to Dr Ivor Griffith awaiting attention

"I recall that the matter was discussed in Council on several occasions and that there was a general understanding that the payments made to Dr Griffith were

solely on account of the clerical services which he was obliged to procure. It was my understanding, also, that an honorarium would be tendered to him for his own valuable services as Editor of the manuscript of the text of the Recipe Book at some future date. I do not recall that any formal motion to that effect was adopted, but the sum of \$500 00 was named in the discussion, and it was also suggested that the honorarium be paid after the Recipe Book had been issued and placed on sale.

"I feel sure that Dr Griffith abundantly deserves such recognition, and would be glad to second a motion awarding him the honorarium of \$500 00."

(Motion No 29) It is moved by LaWall that Professor Ivor Griffith be paid an honorarium of \$500 00 for his services as Editor of the Pharmaceutical Recipe Book, First Edition, and that this sum be added to the appropriation for the Recipe Book in the Budget for 1935

A vote on this motion will be called for in about two weeks.

80 Life Members E Fullerton Cook, Philadelphia, Pa, Charles Morgan, Baltimore Md, and Leonard A Seltzer, Detroit Mich, have become Life Members through the payment of dues for thirty-seven years, and Edwin R Westmoreland, Lockhart, Texas, through membership since 1910 and the payment of \$25 00.

81 Applicants for Membership The following applications properly endorsed and accompanied by the first year's dues have been received:

No 110, Douglas Carleton Fernlock, 6159 Commonwealth Detroit, Mich, No 111 Glendouglas Gordon Stewart, 810 Broadway, Saskatoon, Canada, No 112 Horace E Grant, 238 Highland St, Portsmouth, N H, No 113, Morris M Daffner, 1068 Willett St Schenectady N Y, No 114, Richard Roubos, P O Box No 7, Oakdale Calif, No 115, Joseph Frank Tandy, 323 E Forest Ave, Detroit, Mich, No 116 Harry Lindstrom 1220 Eddy St, Chicago, Ill, No 117, Buford Lee White, University Station, Gainesville Florida, No 118, Elbert Voss, University of Florida, Gainesville Fla No 119, Walter Dennis Griffin, Jr, Pi Delta Sigma House, Gainesville, Fla, No 120, Robert Gerald Goedhart, 414 N Pleasant St Gainesville Fla, No 121, E Herbert Gilliland, Route No 4 Gainesville Fla No 122, Cleveland Joseph Bourgeois, 200 S Wilson St, Gainesville, Fla, No 123 Harvey A Henry, Sixth & St Paul Los Angeles, Calif, No 124, Sister M Conchessa, College of St Catherine, St Paul, Minn, No 125 Joseph Harrison Beckwith Murray, U S Veterans Admn Pharmacy, S L C, Utah, No 126 Nathan Isaac Liss, 1818 N Smallwood St, Baltimore Md, No 127 Edgar A O'Harrow, 110 S Indiana Ave, Bloomington, Ind, No 128, Vincent B Norelli 1121—17th St, N W, Washington D C, No 129, Sister Mary Oswald Flaherty, 2010 Adams Ave, Scranton, Penna, No 130 Anthony Scacciaferro, 665 Summer Ave, Newark N J, No 131, Isaac J Epstein, 2552—8th Ave, New York N Y, No 132 William O Smith, 1656 W Va Ave, N W, Washington D C, No 133, Michael James Ward, 39 Main St, Westernport Md No 134 Morris Heron Wise 921 S Bonnie Brae, Los Angeles, Calif, No 135, George Ross Fowler 245 S Oxford Ave Los Angeles, Calif, No 136, John R Leach, 6615 S E Foster Rd Portland, Ore, No 137 S A Matthieu, 1 N Russell St Portland, Ore No 138, Herbert C Miller, Pres North Pacific College, Portland, Ore, No 139, Edmund Herman MacLaughlin 43d & Kingsessing Philadelphia Pa, No 140, Irving P Biber, 119 Aldine St, Newark N J, No 141, Vincent Michael Matteis 458 Lafayette Ave, Brooklyn, N Y, No 142, William George Healey, Jr, 226 S Clinton St Baltimore, Md, No 143, Dorothy Stam, 2412 Eutaw Place, Baltimore, Md, No 144 Alexander John Ogrinz 2210 Prentiss Place, Baltimore, Md, No 145, Victor E Levine, 14th & Davenport Sts, Omaha Nebr, No 146, Carl H Johnson 1307 E 41st St, Seattle Wash No 147, Charles Homer Jackson P O Box 309, Mountain Grove Mo, No 148 Shozo Miyaki Lahaina Maui Hawaii, No 149, Henry J Plowhead, 3326 N E Clackamas, Portland Ore, No 150 Edgar Stupe, 605 S W 4th Ave, Portland Ore, No 151, Peter T Ingram, 900 West End Ave, New York N Y, No 152, William D Grady, 512 Edwards St R D No 5, Johnstown Penna, No 153, Frances Garman, Box 192, College Sta, Pullman, Wash No 154, Glen Smith 510 Campus Ave, Pullman, Wash, No 155, Arthur Johnson, 403 Pioneer Way, Pullman, Wash, No 156, Forest Marvin Klick, 103 S Fifth Ave, St Charles, Ill, No 157 William S Maltman 123 Printz Ave, Norwood Pa, No 158, Howard Zimmer, Route No 2, Canby, Oregon, No 159, Edward J Prochaska, Pine City Minn, No 160, Margaret Anne Pearson, Children's Hospital Washington, D C, No 161, Ernest DeWitt Reason, c/o S E Massengill Co Bristol, Tenn No 162 Harry Kaye Whalen Drug Co, 82—39th St Brooklyn N Y, No 163, Elmer A

Buerge, 10514 E Jefferson, Detroit Mich, No 164, Melvin Hanlin, Y M C A, Indianapolis, Ind, No 165, Helen Glucksmann, 2801 Boulevard, Jersey City, N J, No 166, Lillian K Chin 414 W Saratoga St, Baltimore, Md, No 167, William Tombari, College Sta, Pullman, Wash, No 168, Theodore Schlosser, c/o W L Dillon, Rt 3, Pullman, Wash, No 169, Olive Conant College Sta, Pullman, Wash, No 170, Roy Christensen, College Hospital Pullman Wash No 171, John Vibber, S P E House, Pullman, Wash, No 172, Arthur Miller, College Sta, Pullman, Wash, No 173, Herman Forslund, 902 Colorado, Pullman, Wash, No 174, Emily Giles, Cliff House, Pullman, Wash, No 175, Stanley George Mittelstaedt, 1211 Morton St Pullman, Wash, No 176, Orion Furness, 405 Colorado, Pullman, Wash, No 177, Maxine Gumz, College Sta, Pullman, Wash, No 178 Jack Engeln, 906 Thatuna, Pullman Wash, No 179, Victor Himmelfarb, 408 Queen St W, Toronto, Ont, Canada, No 180, Howard Stephenson, 572 Madison Ave, New York N Y, No 181, Frank Reinish, 8 Elliott St, Morristown, N J, No 182, John W Widmann, Bellefonte Ave, Lock Haven, Penna, No 183, Melvin A Widmann Bellefonte Ave, Lock Haven, Pa, No 184, Lester F Widmann, 220 W Water St, Lock Haven, Pa, No 185 Philip A Teah, Water & Vesper Sts, Lock Haven, Pa, No 186, Sister M Alphonsa Schorp, 365 Ridge Ave Evanston, Ill, No 187, Felix L Wiatrowski, 807 W Thomas St South Bend, Ind, No 188, Frederick Francis Johnson, 4515—16th Ave, N E, Seattle, Wash, No 189 Samuel T Helms, Bromo-Seltzer Tower Bldg, Baltimore, Md, No 190, Laird C Dinsmore, 93 Henry St, Brooklyn N Y No 191 Taylor W Hoskins, State Board of Health Louisville, Ky, No 192, Doris Beauchamp, College Station, Pullman, Wash, No 193, Marjorie Whiteside, College Sta, Pullman, Wash, No 194 Robert L Johnson, Hillcrest Apt No 14, Pullman Wash, No 195, Sister Mary Esther, Berry & Broadway, Fort Wayne, Ind, No 196 Jack A Dascoll 40 Cook Ave, Madison N J, No 197, Emil Gottesman, 414 E 169th St New York N Y, No 198 Leon Rose, 241 W 101st St, New York, N Y, No 199 Christian F, Wight 314—20th St, West New York, N J, No 200 Vincent Anthony Lapenta, 711 Indiana Pythian Bldg, Indianapolis Ind

(Motion No 30) *Vote on applications for membership in the American Pharmaceutical Association* E F KELLY Secretary

LETTER NO 16

May 7, 1935

To the Members of the Council

82 *Year Books for the Library of Congress* Motion No 26 (Council Letter Nos 12, page 167, and 14 page 426) has been carried

83 *Minutes of the Meeting of the Executive Committee* Motion No 27 (Council Letter No 13, page 329) has been carried President Fischelis voted "No" for the reason given in his letter of April 3, 1935, of which copies were sent to members of the Council

84 *Sale and Exchange of Liberty Bonds* Motion No 28 (Council Letter No 14, page 428) has been carried President Fischelis voted "No" for the reason given in his letter of April 3 1935, of which copies were sent to the members of the Council The Fourth Liberty Loan Bonds referred to were delivered for exchange and sale The U S Treasury Bonds, 27/8%, 1955-1960 have not, as yet been delivered and a report will be submitted promptly upon their receipt

85 *Committee on National Formulary* See Council Letter No 15, page 509 President Fischelis has submitted the following

'I would like to nominate Professor Arno Viehoever of Philadelphia, for membership on the National Formulary Committee, to succeed Dr Farwell As you well know, Dr Viehoever is an outstanding pharmacognosist and would, no doubt, serve in a capable manner'

(Motion No 31) *As no other nominations have been received than those of Dr E H Wirth and Prof Arno Viehoever, the members of the Council are requested to vote on these two nominees*

86 *Honorarium for Editor of Recipe Book I* See Council Letter No 15, page 509 Dr H V Army submitted the following letter

'Commenting on Motion No 29 (Council Letter No 15), I beg leave to make the following comments (1) In 1924 an appropriation of \$1000 00 was made to Dr

Griffith to edit the manuscript of Recipe Book No 1 as he received it from Chairman Lascoff and to carry the work through the press to its ultimate publication (2) I learn that during 1925-1929 Dr Griffith received \$1375 66 for this purpose (3) I, therefore, cannot see why another \$500 00 appropriation be granted to Dr Griffith especially since Chairman Lascoff has neither received nor asked for an honorarium for his fine work in behalf of the Recipe Book "

President Fischelis requested certain information with respect to the payment of honoraria, in his letter of April 3, 1935, of which copies were sent to the members of the Council Copies of the secretary's reply of April 5, 1935, were also sent to members of the Council

A vote on Motion No 29 is called for at this time

87 *Election of Members* Motion No 30 (Council Letter No 15 page 511) has been carried and applicants for membership numbered 110 to 200 are declared elected

88 *Committee on Library and Committee on Museum* The members of the Council are requested to submit nominations for the members of these two special committees (Council Letter No 13, page 331) Please note that the membership of these committees is not limited to Council members and is to be selected with special reference to their knowledge and experience

89 *Program of the 1935 Meeting* The tentative general program is being completed and will be submitted to the Council in an early letter

90 *Applicants for Membership* The following applications properly endorsed and accompanied by the first year's dues have been received

No 201, Carle Muzzy Bigelow, c/o the Calco Chemical Co, Bound Brook, N J No 202 F W Moudry, 5th & St Peter Sts, St Paul, Minn, No 203, Jennie Morrow Banning, St Joseph Mercy Hospital, Sioux City, Iowa, No 204, Michael F Hastings, 106 High St, Clinton Mass, No 205, Bernard Schneider, 1564 St Paul St, Rochester, N Y, No 206, William R Bond, 21 Grey Oaks Ave, Nepera Park, N Y, No 207, Harry A Nuse, 155 Leonard St, New York, N Y, No 208, W O Frohring, 4814 Prospect Ave, Cleveland Ohio, No 209, Evelyn Gray Scott, 11809 Cromwell Ave, Cleveland Ohio, No 210, Morgen Reno Hohmann, 6721 Bartmer Ave, St Louis, Mo, No 211, Albert H Musick, 624 W 49th St Los Angeles, Calif, No 212, Abraham Lynn Dubinbaum, 1501 Undercliff Ave, Bronx, New York City, No 213, Joseph Ludwig Stummer, 23 E 20th St, New York N Y, No 214, Hyman Ferber, 1483 Bryant Ave, New York, N Y, No 215, Eugene Renaud, Fort & State Sts, Lincoln Park Mich, No 216, Lucille Dahlquist, College of Pharmacy, San Francisco, Calif, No 217, Frederick P McNess, 620 N Lake St, Madison, Wis, No 218, Sister M Marcina, 390 E Division St, Fond du Lac, Wis

(Motion No 32) *Vote on applications for membership in the American Pharmaceutical Association*

E F KELLY, Secretary

LETTER NO 17

May 27, 1935

To the Members of the Council

91 *Committee on National Formulary* Dr E H Wirth has been elected as a member of this Committee to serve the unexpired term of Oliver A Farwell

92 *Honorarium for Editor of Recipe Book I* The vote on Motion No 29 (Council Letters No 15, page 509, and No 16 page 511) is not complete and the announcement will, therefore, be deferred

93 *Election of Members* Motion No 32 (Council Letter No 16, page 512) has been carried and applicants numbered 201 to 218, inclusive, are declared elected

94 *Committee on Library and Committee on Museum* Those members of the Council who have not submitted nominations for members of these two special committees (Council Letter 13, page 331, Council Letter No 16, page 512) are requested to do so promptly

95 *Use of the Text of the N F VI* The following communication has been received through Chairman Gathercoal from Paul Nicholas Leech Secretary Council on Pharmacy and Chemistry of the American Medical Association

"The Council on Pharmacy and Chemistry is about to revise its publications dealing with National Formulary products so as to bring them into conformance with the new National Formulary. It is hoped that the revisions of these books can start about June 1st. The Council has therefore directed the secretary to communicate with you and to ask for permission to quote from the National Formulary in the forthcoming editions of the following books: 'Useful Drugs,' 'Hospital Practice for Interns,' 'Epitome of the U. S. Pharmacopœia' and 'National Formulary'.

In order that you may know the general scope of these books a complimentary copy of each is being sent to you. It is understood, of course, that if permission is granted there will be published on the back of the title page the announcement of the permission of your Committee, such as now appears in the books being sent to you. If this statement requires any modification the Council shall be pleased to make it in accordance with the desires of the National Formulary Committee."

The request was referred to Chairman DuMez of the Committee on Publications who writes as follows:

"Inasmuch as the privilege to use portions of the text of the National Formulary for comment has been given to the American Medical Association in the past, and that ASSOCIATION has not abused the privilege, to the best of my knowledge, I can see no good reason why this privilege should not be extended as heretofore."

(Motion No. 33) It is moved by DuMez that the American Medical Association be granted permission to use for partial reproduction the text of the N. F. V in its publications entitled "Useful Drugs," "Hospital Practice for Interns," and "Epitome of the U. S. Pharmacopœia and National Formulary" with the understanding that the usual notice will appear on the back of the title page of each of the publications and that these publications will not be issued until after the N. F. VI has been issued and that no charge be made. A vote on this motion will be called for in about ten days.

96 *Tentative General Program for the Eighty Third Meeting.* With the approval of President Fischelis, Local Secretary Mickelsen and the Committee on Standard Program of the Council, the secretary submits the attached tentative general program. Officials of the various affiliated organizations represented in the program have approved those features in which their respective organizations are directly interested.

The important changes suggested in the tentative program for the 1935 meeting are:

(a) The meeting of the Council heretofore held on Monday has been scheduled for the Saturday preceding. The object is to avoid the conflict with the sessions of the A. A. C. P. and the N. A. B. P. on Monday and to provide time for the uninterrupted consideration of the important business to come before the Council. It is understood that the meeting of the Council will be continued on Sunday if necessary.

(b) Provision is made for a Joint Meeting of the Council and the Executive Committee of the N. A. R. D. on Wednesday afternoon, August 7th.

(c) Meetings of the Committees on Nominations and on Resolutions are scheduled in order that those who may desire to appear before these Committees will have the opportunity to do so.

(d) The Third Session of the House of Delegates is scheduled for Friday afternoon rather than on Friday morning and the short Final Session of the House heretofore held just prior to the Final General Session on Friday evening is omitted, since the change above mentioned makes the short session unnecessary. Under the proposed arrangement, the sessions of the Sections will be completed by noon on Friday and all resolutions and actions requiring consideration by the House of Delegates can be acted upon at the Friday afternoon session. In addition, time will be available to prepare the final report of the House for consideration at the Final General Session.

In this connection, the following letter has been received from Chairman Hilton:

"I approve the Tentative Program for the Portland Meeting with the exception of the meeting of the Council on Saturday, August 3rd.

"It is my belief that this meeting of the Council should be scheduled for Sunday, August 4th, at 10 A. M. because it will be difficult to secure the attendance of

a quorum on Saturday and because the business to come before the Council can certainly be completed during a morning, afternoon and evening session on Sunday I understand that Dean Bradley has expressed the same opinion

Please place this statement before the Council in submitting the Tentative Program and I suggest that, when a vote is called for, you request an opinion from the members of the Council "

(*Motion No 34*) *It is moved by Kelly that the tentative general program of the Eighty Third Annual Meeting be approved* A vote on this motion will be called for in about ten days

E F KELLY, *Secretary*

TENTATIVE GENERAL PROGRAM FOR THE EIGHTY THIRD ANNUAL MEETING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION AND RELATED ORGANIZATIONS, HOTEL MULTNOMAH, PORTLAND, OREGON, AUGUST 1-10, 1935

All dates included in special fare arrangements with railroads

AUGUST 1-3		6 00 P M	Dinner, A A C P—Marine Room
Plant Science Seminar Program to be arranged Meetings will be held at the North Pacific College of Oregon		8 00 P M	A A C P—Junior Ball Room
		9 30 P M	Reception—(Informal) followed by dancing—Masonic Temple Ball Room
SATURDAY, AUGUST 3			
10 00 A M	Council A Ph A—Cameo Room		TUESDAY, AUGUST 6
2 00 P M	National Conference on Pharmaceutical Research—Assembly Hall	9 00 A M	Joint Meeting N A B P and A A C P—Assembly Hall
8 00 P M	National Conference on Pharmaceutical Research—Assembly Hall	12 15 P M	Luncheon, Committee on National Formulary
		1 30 P M	First Session, House of Delegates—Grand Ball Room
		2 30 P M	N A B P—Assembly Hall
		2 30 P M	A A C P—Junior Ball Room
8 00 P M	American Council on Pharmaceutical Education—Empire Room	6 30 P M	Banquet, A Ph A and Related Organizations—Masonic Temple Ball Room
SUNDAY, AUGUST 4			
MONDAY, AUGUST 5			WEDNESDAY, AUGUST 7
9 00 A M	N A B P—Assembly Hall	9 00 A M	First General Session, A Ph A—Grand Ball Room
9 00 A M	A A C P—Executive Committee—Empire Room	12 15 P M	Luncheon, Syllabus Committee
9 00 A M	A A C P—Teachers Conferences	2 00 P M	First Session, Scientific Section—Assembly Hall
	Chemistry Conference—Club Room	2 00 P M	First Session, Section on Education and Legislation—Colonial Room
	Pharmacy Conference—Junior Ball Room	2 00 P M	First Session, Section on Commercial Interests—Marine Room
	Pharmacognosy and Pharmacology Conference—Colonial Room	2 00 P M	First Session, Section on Historical Pharmacy—Rose Room
	Pharmaceutical Economics Conference—Marine Room	2 00 P M	First Session, Conference of Pharm Assoc Secretaries—Club Room
1 30 P M	N A B P—Assembly Hall Room	3 00 P M	Joint Meeting Executive Committee, N A R D and Council, A Ph A—Cameo Room
1 30 P M	A A C P—Junior Ball Room		
6 00 P M	Dinner, N A B P—Assembly Hall Room		

- 3 00 P M Meeting Committee on Nominations—Empire Room
- 6 00 P M Dinner, Rho Chi Fraternity followed by Annual Convention
- 6 00 P M Dinner, Lambda Kappa Sigma Sorority
- 8 00 P M Second Session, House of Delegates—Grand Ball Room

THURSDAY, AUGUST 8

- 9 00 A M Council A P H A —Cameo Room
- 9 00 A M Second Session, Section on Commercial Interests—Marine Room
- 9 00 A M Second Session, Scientific Section—Assembly Hall
- 9 00 A M First Session, Section on Practical and Dispensing—Grand Ball Room
- 9 00 A M Second Session, Section on Historical Pharmacy—Rose Room
- 9 00 A M First Session, Conference of Law Enforcement Officials—Club Room
- 12 00 M Veteran Druggists' Luncheon
- 2 00 P M Second General Session, A P H A —Grand Ball Room
- 6 00 P M Dinner, Kappa Psi Fraternity
- 6 00 P M Dinner, Phi Delta Chi Fraternity
- 6 00 P M Dinner, Kappa Epsilon Fraternity
- 8 00 P M Joint Session, Scientific Section and Section on Practical Pharmacy and Dispensing—Assembly Hall
- 8 00 P M Joint Session, Section on Education and Legislation, Conference of Pharmaceutical Law Enforcement Officials, and Conference of Pharmaceutical As-

soc Secretaries—Junior Ball Room

- 8 00 P M Meeting Committee on Resolutions—Rose Room

FRIDAY, AUGUST 9

- 9 00 A M Third Session, Scientific Section—Assembly Hall
- 9 00 A M Second Session, Section on Practical Pharmacy and Dispensing—Grand Ball Room
- 9 00 A M Second Session, Section on Education and Legislation—Colonial Room
- 9 00 A M Second Session, Conference of Law Enforcement Officials—Junior Ball Room
- 9 00 A M Second Session, Conference of Pharmaceutical Association Secretaries—Club Room
- 1 00 P M Meeting, Committee on Resolutions—Rose Room
- 2 00 P M Final Session, House of Delegates—Grand Ball Room
- 5 45 P M Dinner, Former Presidents, A P H A —Multnomah Hotel
- 6 00 P M Special Dinners
- 8 00 P M Final General Session, A P H A —Assembly Hall
- 10 00 P M Farewell Party—Grand Ball Room
- 10 00 P M Council A P H A —Cameo Room

SATURDAY, AUGUST 10

- 9 30 A M An all-day scenic drive up the Columbia River Highway including a visit to the Bonneville Dam and an out-door luncheon featuring Columbia River salmon

PARTIAL LIST OF PAPERS OF THE SECTIONS, CONFERENCES, ETC

Officers who have not reported will please mail programs as far as they have been completed by *Special Delivery*, to the Editor of the JOURNAL A P H A , 2215 Constitution Ave, Washington, D C This request is made, because it is necessary for the preparation of the program

Contributors should at once send in their papers to Section and Conference Officers See list of Officers under Societies and Colleges in this issue of the JOURNAL

SCIENTIFIC SECTION

Members and Friends of the Scientific Section, American Pharmaceutical Association

The 83rd annual meeting will be held in Portland, Oregon, during the week of August 5th

The Scientific Section will hold several sessions and for the officers to plan these sessions, we should know as early as possible not only the titles of the papers to be presented but

also have short abstracts of them With this information the program can be arranged so as to group the papers on a common subject

It is now only about four weeks before the convention, and authors of papers should advise the secretary promptly, giving titles of the papers which they will present, and also note if they expect to be present in person or if the paper is to be presented by title

The By-Laws provide that papers shall be presented in duplicate, so that one copy will be available for publication and the other can be referred to the Committee on Ebert Prize In writing the paper, the authors should follow the procedure as outlined in the March JOURNAL, page 256 (Also on the page facing the Abstract Section of each issue of the JOURNAL) When submitting your title, also inform the secretary whether a lantern will be required for the presentation

FRANCIS E BIBBENS, *Secretary*

PARTIAL LIST OF PAPERS FOR SCIENTIFIC SECTION, A PH A

"A Study of *Lacinaria* Species," B V Christensen and G M Hocking

"The Assay of Organic Medicinal Preparations Containing Arsenic," Edward J Hughes

"Modern Pharmaceutical Research Problems," Henry J Goeckel

"Absorption of Drugs by the Human Skin," A Richard Bliss, Jr

"The Microscopy of Powdered Desiccated Thyroid and Suprarenal Glands," Heber W Youngken

"Antiseptics A Comparative Study of Laboratory and Practical Tests," George F Reddish

PARTIAL LIST OF PAPERS FOR SECTION ON PRACTICAL PHARMACY AND DISPENSING

"Improvement in Technique in the Preparation of Three Common Products," Edward D Davy

"Professional Pharmacy," Ernest T Stuhr

"Potent Medicaments in Sugar-Coated Pills and in Confections," John F Suchy

"Difficult Prescriptions, Series No 4," J Leon Lascoff

"Enteric Pill Coatings," F S Bukey

"The Hospital and the Pharmacist, Some Observations in Establishing a Department of Pharmacy in a Hospital," H C McAllister

"Studies on Three U S P and N F

Preparations by Shortened Procedures," Henry M Burlage and W J Smith

The following have promised papers to the Section Carl Gibson, C George Hamilton, George Secord, R P LeRoy Thomas G Wright, Wilham F Reindollar J Solon Mordell P W Howard, R L Swain, L M Kantner Marvin J Andrews

PARTIAL LIST OF PAPERS FOR SECTION ON COMMERCIAL INTERESTS

"The Pharmacist Studies Law," Charles G Ajax

"How to Help the Pharmacist Commercially," Eugene C Brokmeyer

"A Study of the Commercial Pharmacy Curriculum," Neal Bowman

"What Determines Net Profit? C Leonard O'Connell

"The Fair Trade Acts and Their Effects" Paul C Olsen

"The Selling Price of Prescriptions," Frank A Delgado

"The Open View Prescription Department" Frank A Delgado

"Merchandising Your Profession" Ralph A Beegle

"The Need of Commercial Training in Colleges of Pharmacy," Ralph A Beegle

"Dogs, Cats, Birds and Babies," Alice-Esther Garvin

"The Futility of Cutting Prices and a Comparative Price Survey of Two States—One with a Price Maintenance Act," George F Archambault

"The California Fair Trade Act" Ira J Darling

"Vaccines and Serum Products of U S P XI" Clarence M Brown

PARTIAL LIST OF PAPERS FOR SECTION ON HISTORICAL PHARMACY

"A Brief History of the Drug Code," E F Kelly

"The First Pharmacist in North America" T J Bradley

"Medicine Making as Depicted by Museum Dioramas" Charles Whitebread

"Honoring Age and Service," John E Kramer

"The Origin and Development of Pharmaceutical Education in the United States," Ernest T Stuhr

"Report of the Pharmacy Exhibit at the World's Fair during 1933 and 1934," H C Christensen

'History of the Darflinger Druggist's Show Globes," Robert W Rodman

"David Henshaw, the Druggist's Secretary of the Navy," George E Éwe

"The Pharmaceutical Museum at the University of Minnesota," Frederick J Wulling

"Drugs of the Bible," A R Bliss, Jr

"The Ancient Medicinal Uses of Gems and Precious Stones," A R Bliss, Jr

"William Withering and the Introduction of Digitalis into Medical Practice" Louis H Roddis

'Estonian Pharmacy " Rudolf Wallner

Thirty-Second Annual Meeting of the

NATIONAL ASSOCIATION OF BOARDS OF PHARMACY

HOTEL MULTNOMAH, PORTLAND, OREGON,
AUGUST 5-6, 1935

OFFICERS

President, C H Evans, *Honorary President*, F W Hancock, *Vice Presidents*, George Moulton, John Woodside, E V Zoeller, Albert Ely, Wm Muesing, C M Brewer, R C Shultz, R W Fleming, *Secretary*, H C Christensen, *Treasurer*, J W Gayle

Program

MONDAY, AUGUST 5, AT 9 30 A M—FIRST SESSION—ASSEMBLY HALL ROOM

- 1 Call to Order, President C H Evans
- 2 Roll Call
- 3 Appointment of Committee on Credentials, President C H Evans
- 4 President's Address Charles H Evans
- 5 Appointment Committee on President's Address
- 6 Report of Secretary, H C Christensen
- 7 Report of Treasurer, J W Gayle.
- 8 Appointment of Nominating Committee, President Evans
- 9 Report of Executive Committee, A L I Winne, *Chairman*
- 10 Presentation of Suggested Amendments to Constitution and By-Laws, L C Lewis, *Chairman*

MONDAY, AUGUST 5, AT 1 30 P M—SECOND SESSION—ASSEMBLY HALL ROOM

- 1 Report of Advisory Examination Committee, H C Christensen, *Chairman*
- 2 Report of Syllabus Committee

3 Report of Legislative Committee, Mac Childs, *Chairman*

4 Report of Committee on National Legislation, R L Swain, *Chairman*

5 Report of Committee on Prerequisite, R W Fleming, *Chairman*

6 Report of Publicity Committee, Rowland Jones, *Chairman*

7 Report of Grievance Committee, W M Hankins, *Chairman*

8 Report of Committee on National Certificate, H C Christensen, *Chairman*

9 Report of Committee on Minimum Standards of Technical Equipment, A C Tayler, *Chairman*

10 Report of Committee on Pharmaceutical Jurisprudence, Roy B Cook, *Chairman*

11 Report of Committee on Code Matters, R L Swain, *Chairman*

12 Report of Banquet Committee, Linn E Jones, *Chairman*

MONDAY, AUGUST 5, AT 6 30 P M—N A B P BANQUET—ASSEMBLY HALL ROOM

TUESDAY, AUGUST 6, AT 9 00 A M—JOINT SESSION—ASSEMBLY HALL ROOM

National Association of Boards of Pharmacy and American Association Colleges of Pharmacy—program to be announced later

TUESDAY, AUGUST 6, 1 30 P M—FINAL SESSION—ASSEMBLY HALL ROOM

- 1 Reports of Vice-Presidents
District No 1, George Moulton
District No 2, John M Woodside
District No 4, Albert E Ely
District No 5, Wm C Muesing
District No 6, Mac Childs
District No 7, R C Shultz
- 2 Report of Committee on President's Address
- 3 Report of Department of Education, R L Swain, *Director*
- 4 Report of Committee on Constitution and By-Laws, L C Lewis, *Chairman*
- 5 Report of Resolutions Committee, A C Taylor, *Chairman*
- 6 Report of Committee on Plaque, J A J Funk, *Chairman*
- 7 Reports of Special Committees
- 8 Unfinished Business
- 9 New Business
- 10 Report of Nominating Committee
- 11 Election and Installation of Officers
- 12 Adjournment

**Thirty-Sixth Annual Meeting of the
AMERICAN ASSOCIATION OF
COLLEGES OF PHARMACY**

HOTEL MULTNOMAH, PORTLAND, OREGON,
AUGUST 5-6 1935

OFFICERS

President, Ernest Little, *Vice President*,
Antone O Mickelsen, *Secretary Treasurer*,
Zada M Cooper, *Chairman of the Executive
Committee*, Charles B Jordan

MONDAY, AUGUST 5TH

9 00 A M Meeting of Executive Committee—
Empire Room

9 30 A M Meetings of Teachers' Conference

Conference of Teachers of Pharmacy, Monday,
August 5th, 9 30 A.M.—Junior Ball Room

OFFICERS

Chairman, W G Crockett *Vice-Chairman*,
Leon W Richards, *Secretary* Emery T
Motley

Program

A Round Table Discussion of Pharmaceu-
tical Technique as Described in the Syllabus

Conference of Teachers of Chemistry, Monday,
August 5th, 9 30 A M —Club Room

OFFICERS

Chairman Marion L Jacobs, *Secretary*,
John C Bauer

Program

1 Instruction about Synthetics, E V Lynn
Discussed by—George L Webster and
Glenn L Jenkins

2 The Teaching of Food and Drug Analysis
C C Glover Discussed by—Russel A
Cain and Frederick Grill

Conference of Teachers of Pharmacognosy and
Pharmacology—Monday, August 5th, 9 30
A M —Colonial Room

OFFICERS

Chairman, A John Schwarz, *Secretary*
Charles E F Mollett

Program

Topics for Discussion

1 Pharmacology Definition and Scope of
the Course for Pharmacy Majors
Frank H Eby and H M Burlage

2 Should the Term Materia Medica Be
Deleted from Our Catalogs and from
State Board Examinations? C E
Mollett

3 Should Undergraduate Students in Phar-
macy Do Animal Experimentation or
Should the Course Be Taught by
Demonstration? F J Bacon

4 Biological Assays for Undergraduate
Students in Pharmacy, D B R
Johnson

5 Correlation of the Courses in Pharma-
cology and Physiology, Dr Van Loan

6 Pharmacology as a Basis for Improving
Relations with Physicians, B V
Christensen

7 Suggestions for a Course in Botany for
Pharmacy Students, H M Wilson and
Ralph Bienfang

Paper—'A Study of the Records of the Same
Class in Botany and Pharmacognosy,"
Marin S Dunn

Conference of Teachers of Pharmaceutical
Economics—Monday, August 5th, 9 30 A M —
Marine Room

OFFICERS

Chairman, Paul C Olsen *Secretary*, John F
McCloskey

Program

Topics for Discussion

Trends in drug store profits 1932 1933 and
1934

Accounting records necessary and desirable
in drug stores

The operation of state fair trade acts for re-
sale price control

SESSIONS OF THE ASSOCIATION

First Session, Monday, August 5th, 1 30
P M —Junior Ball Room

Roll Call

Appointment of Committee on Resolutions

Address of the President Ernest Little

Report of the Secretary Treasurer Zada M
Cooper

Report of Executive Committee Charles B
Jordan

Appointment of the Nominating and Audit-
ing Committees

Paper—"The Four Year Course in Phar-
macy" C O Lee and H G DeKay

Reports of Standing Committees

Committee on Educational Standards
Edward Spease

Committee on Curriculum and Teaching Methods, Robert C Wilson
 Committee on Activities of Students and Alumni, George C Schucks
 Delegates to the American Council on Education, Rufus A Lyman

MONDAY, AUGUST 5TH, 6 00 P M

Annual Dinner

Address by Dean E H Lauer of the University of Washington

Second Session, Monday, August 5th, 8 00 P M —Junior Ball Room

Reports of Standing Committees (*Continued*)

Committee on Relation of Boards and Colleges, D B R Johnson

Committee on Libraries, Charles O Lee

Committee on Problems and Plans, Rufus A Lyman

Papers—"Objectives and Objective Tests"

For Qualitative Analysis, H G DeKay

For Organic Chemistry, C J Klemme

Syllabus Committee, J G Beard

Paper "The Teaching of Bacteriology to Pharmacy Students," George F Reddish

Reports of Special Committees

Committee on Student Branches of the AMERICAN PHARMACEUTICAL ASSOCIATION, George L Webster

Committee on the Establishment of a Pharmaceutical Corps in the United States Army, Townes R Leigh

Committee to Study List of Crude Drugs Prepared by District No 2, Heber W Youngken

Joint Session of the National Association of Boards of Pharmacy and the American Association of Colleges of Pharmacy, Tuesday, August 6th, 9 00 A M —Assembly Hall Room

Report of the Fairchild Scholarship Committee, E G Eberle

Paper—"The Possibilities and Limitations of Cooperation between Boards of Pharmacy and Colleges of Pharmacy," Robert P Fischelis

Report of Recommendations or Resolutions Referred from District Meetings, D B R Johnson

Third Session, Tuesday, August 6th, 2 00 P M —Junior Ball Room

Reports of Special Committees (*Continued*)

Committee on Membership Standards, A G DuMez

Committee on Code Matters, W F Rudd

Committee on Food and Drug Legislation, Charles B Jordan

Report of Committee on Resolutions

Reports of Special Representatives

Representative on American Council on Pharmaceutical Education, A G DuMez
 Reporter on Biological Abstracts, Heber W Youngken

Representatives to National Conference on Pharmaceutical Research, Glenn L Jenkins

Representatives to National Drug Trade Conference

Representatives to the Druggists' Research Bureau, Paul C Olsen

Representative to the National Association of Retail Druggists John F McCloskey

Report of Historian, Edward Kremers

Unfinished Business

Miscellaneous

New Business

Executive Session

Other programs under 'Societies and Colleges'

SCIENTIFIC SECTION OF THE PROPRIETARY ASSOCIATION

At the recent meeting of the Proprietary Association plans were formulated for work of the Scientific Section under direction of Dr Geo F Reddish, assisted by Dr Frederick J Cullen. The foregoing will be assisted by a group of three scientists, to be appointed

OFFICERS OF THE PROPRIETARY ASSOCIATION

The election for officers of the Proprietary Association resulted in the unanimous re turning of the retiring executives to office, as follows: *President*, Frank A Blair, New York, *Honorary Vice President* Dr V Mott Pierce, Buffalo, *First Vice-President*, Henry F Bristol, New York, *Second Vice-President*, E K Hyde, Buffalo, *Third Vice-President*, J H Howe St Louis, *Secretary-Treasurer*, Charles P Tyrrell, Syracuse

N W D A CONVENTION

The sixty-first annual convention of the National Wholesale Druggists Association will be held September 29th to October 3rd at the Greenbrier Hotel, White Sulphur Springs W Va. R C Treseder is chairman of the arrangements and entertainment committee

COMMITTEE REPORTS

COMMITTEE ON RESEARCH, AMERICAN PHARMACEUTICAL ASSOCIATION

H V ARNY, CHAIRMAN

The question of the 1935-1936 award from the A P H A Research Fund has been given the careful consideration of the Research Committee, and by mail ballot, it was decided that the grant of \$1000 00 be devoted to *one special piece of research*, subject to be decided upon at the August meeting of the Research Committee during the A P H A Convention in Portland, Oregon

The fine work on drug extraction performed by Dr W J Husa and his associates during the past three years and financed by grants from the A P H A Research Fund encourages the Research Committee in the belief that another extended piece of worth-while research is desirable, and this notice is being published by way of an invitation to workers in the field of pharmaceutical research to suggest topics suitable for the creation of a research project to be financed from the A P H A Research Fund

All such suggestions (or applications) shall be laid before a special sub committee consisting of Messrs Cook, Gathercoal, Scoville Beal and Arny who will make specific recommendations of the entire membership of the Research Committee at its Portland meeting At that time the Committee will decide upon the subject of the research project and the person to whom the task will be entrusted, and the recommendations of the Committee will then be transmitted to the A P H A Council and to the General Session of the ASSOCIATION for final action

Suggestions as to topics and requests for the grant should be sent to the *chairman* of the Research Committee H V Arny, 115 W 68th St, New York, N Y, not later than July 10 1935

NATIONAL FORMULARY EXHIBIT AT THE AMERICAN MEDICAL ASSOCIATION CONVENTION *

BY ADLEY B NICHOLS

As usual the National Formulary held an exhibit in the Scientific Section at the annual convention of the American Medical Association, convened this year at Atlantic City, N J, during the week of June 10th

In this year's exhibit advantage was taken of the fact that the new National Formulary will appear shortly A number of the new items were featured, in an attempt to arouse interest and to have the physicians prepared and "up to date," as one of the cards announced

Dr Bernard Fantus, of Chicago, a member of the National Formulary Revision Committee presented a paper before the association, in which he discussed many of the new National Formulary products, together with some of the old, and numerous items of related interest Dr Fantus' paper was used as a basis for the National Formulary exhibit

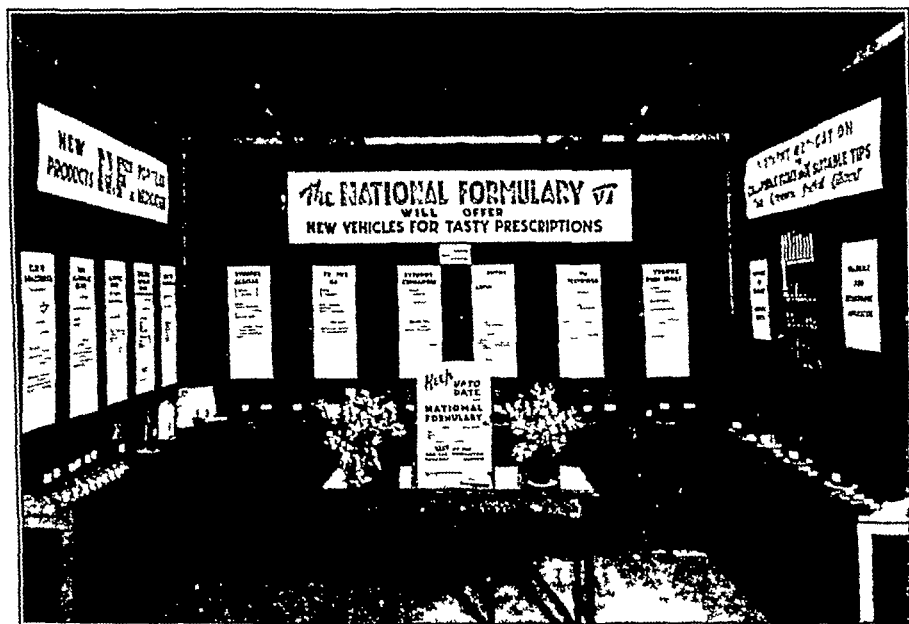
The central section of the National Formulary booth was devoted to a half dozen interesting vehicles The physician to day desired to find out how to make his prescriptions as tasty as possible and he thoroughly appreciates whatever help he can obtain along this line Vehicles have been shown repeatedly in these exhibits, and still continue to be a real drawing card It must be remembered that since the American Medical Association meets in a different section each year, a great many of these in attendance come from the nearby territory and consequently even a repeated item is new to them

The following preparations were included in the central section, Syrup of Acacia, which has been modified for the N F VI, Syrup of Cherry, a striking new vehicle, which received front page attention in the *Philadelphia Evening Bulletin* and *Associated Press News* dispatches, Syrup of Cinnamon and Syrup of Glycyrrhiza, both remodeled N F products, and Syrup of Raspberry, an old favorite which was shown again, because of its popularity

One of the side wings was given to the presentation of the new Iso alcoholic Elixir of the N F VI This was well received and it is hoped that pharmacists will make themselves thor

* Atlantic City, N J, June 10-14 1935

oughly acquainted with the many possibilities of this preparation and be prepared to sponsor it when the N F VI appears Emulsion of Cod Liver Oil with Egg and the New Emulsion of Liquid Petrolatum and Phenolphthalein were also shown on this side of the booth



National Formulary Exhibit at A. M. A. convention, Atlantic City June 10-14, 1935

The other side carried a special display of assorted collapsible tubes and tips, together with ointments and jellies illustrating the specific uses of eye tips, nasal tips, rectal tips, etc. This display was based upon the paper by Dr. Fantus.

As usual, a booklet was prepared briefly covering the high spots of the exhibit and approximately fifteen hundred of these were distributed during the session.

LOCAL BRANCHES

(Continued from page 498)

CHICAGO

The regular monthly meeting of the Chicago Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held on April 16th, at the University of Illinois College of pharmacy. The speaker of the evening was Dr. Paul N. Leech, secretary of the Council of Pharmacy and director of the American Medical Association Chemical Laboratory.

Dr. Leech discussed "Some Topics of Interest to the Pharmacist and Physician."

The discussion began with a review of the present Pure Food and Drugs Act and of the progress being made with the bill before Congress at the present time to strengthen the act.

Dr. Leech stated that so many changes were constantly being made with the present bill that it is absolutely impossible to keep up with the changes and presented the last revised copy of the bill that he had received and which had since been changed.

It was stated that the present bill was good for all of those except where the shoe did not fit and in most cases where it did not fit the objections were against the welfare of the public.

Dr. Leech stated that the present bill had been emasculated and that he hoped for a better bill than the present one as it stands before Congress. Certainly the present law is inadequate but maybe it would be better to amend it than to adopt the new one in its present condition.

Slides were shown and discussed showing the evolution of medicines during the past thirty years This brought out the ease with which testimonials could be obtained from reliable doctors then as compared to now

Slides were shown giving a comparison of trade marked drug prices as compared to similar U S P and N F products The price was unquestionably in favor of the official drugs

Attention was drawn to the many super advertised drugs on the market that are not what their names or description imply Mention was made of many drugs that have been tested by the American Medical Association Laboratories that did not come up to standard It was pointed out that we were not being led to believe that the entire drug trade was in this condition but that only some of the 'sore thumbs' had been discussed to show that there is need for a stricter supervision over those firms who do not have the welfare of the public at heart

Dr Leech made mention of the dearth of new drugs being discovered in America before the war and the rapid progress made in this country since the war At first we began producing many new products of an organic extract nature, then synthetics and now the center of attention seems to be in the biologicals

LAWRENCE TEMPLETON, *Secretary*

NORTHERN NEW JERSEY

The Northern New Jersey Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION held its second annual Physician's Night as its April meeting, on April 15th Due to the development during the year of the New Jersey Formulary the greater part of the evening was devoted to a discussion of this important project William Richert, of Elizabeth, addressed the physicians and pharmacists on the work from the viewpoint of the pharmacist and Dr H B Wilson of Hackensack, discussed the physician's views The Formulary Committee made a display of the various preparations which thus far have been included in the formulary and following the meeting answered questions pertaining to the compounding and use of each product

Dr Hans Molitor, director of the Merck Institute of Therapeutic Research addressed the meeting on the subject, "Therapeutic Research and Its Relation to Pharmacy Medicine and Chemistry," in which he explained the objects of research in developing new drugs justifying the use of old drugs, and in developing new uses for old drugs

The May meeting of the Branch will take the form of a testimonial dinner to Dean Ernest Little in recognition of his services to the profession as president of the American Association of Colleges of Pharmacy The dinner will be held at the Hotel Robert Treat Newark on Monday night, May 20th, at seven o'clock

The officers of the Branch are *President*, George C Schicks, *Vice President* Robert W Rodman, *Secretary*, C L Cox, *Treasurer*, A F Marquer

C L Cox, *Secretary*

PHILADELPHIA

The April meeting of the Philadelphia Branch, AMERICAN PHARMACEUTICAL ASSOCIATION was held in the Temple University, Medical School, Broad and Ontario Streets on April 16 1935

President MacLaughlin called the meeting to order at 8 30 P M The minutes of the March meeting were read and approved as read

Upon a motion by Dr Munch, seconded by Ambrose Hunsberger Dr A T Pollard was elected to Honorary Life membership in the Philadelphia Branch

President MacLaughlin appointed the following committees

Committee on Professional Relations H Evert Kendig, *Chairman*, Dr Wilmer Krusen Charles H LaWall

Committee on Practical Pharmacy Ambrose Hunsberger, *Chairman*, Quintus Hoch Charles T Pickett

Committee on Membership Dr James C Munch, *Chairman*, Alfred Barol Frank H Eby Geo K Schacterle Harvey P Frank, William J Stoneback

Committee on Entertainment Adley B Nichols

The speaker of the evening, Prof Marvin R Thompson of the School of Pharmacy University of Maryland, was then introduced His topic was 'Recent Developments in the Pharmacology and Therapeutics of Ergot' After a brief historical sketch on the introduction of Ergot

into medical practice, the speaker outlined the constituents found in the drug. He summarized, most masterfully, the amino bases and specific alkaloids found in Ergot and discussed the pharmacodynamics of each. He stated that pharmacologically and clinically Ergostetrine proved to be the most active of the alkaloids. The alkaloid "Ergostetrine" discovered and isolated by Prof. Thompson was discussed in detail.

In discussing the U. S. P. X. Cock's Comb Test, Prof. Thompson stated that it seemed to be the most satisfactory test known at the present time, but also he said, that in a sample of Ergot showing a 100% pharmacological activity, 75% of the activity was due to all the Ergot alkaloids and 25% of the activity was due to ergostetrine, whereas clinically 75% of the activity was due to ergostetrine and only 25% of the activity was due to the other alkaloids.

Prof. Thompson was greatly in favor of the use of aqueous or hydro alcoholic extracts of the drug rather than its specific alkaloids.

After a general discussion of the subject a rising vote of thanks was given the speaker for his most interesting lecture.

GEORGE E. BYERS, *Secretary*

NEW JERSEY INTENDS TO MAKE "PRACTICAL EXPERIENCE" MEAN SOMETHING

BY ROBERT P. FISCHELIS

The new New Jersey law which deals with practical experience was signed by the Governor on May 31st, and becomes effective July 1, 1936. The following is taken from a statement made by the secretary of the Board of Pharmacy of the State of New Jersey, Robert P. Fischelis:

"The new legislation provides

"1 That the applicant shall have not less than four years of practical experience obtained in accordance with the rules and regulations of the Board of Pharmacy under a Registered Pharmacist in a registered pharmacy where prescriptions of medical practitioners are compounded and drugs are sold at retail, and which registered pharmacy is approved by the Board of Pharmacy for such purpose.

"2 A credit of not more than three years may be given in lieu of store experience for an equal time spent in a course of study and laboratory instruction in a school of pharmacy approved by the Board of Pharmacy.

"3 The Board of Pharmacy is authorized to conduct written examinations in the theoretical subjects for applications for registration at any time after the applicant has been graduated from an approved college of pharmacy.

4 No candidate shall be examined in practical pharmacy and laboratory work until he has met all of the requirements for registration provided in the law and rules of the Board, and such requirements shall include one year of practical experience served under the supervision of a Registered Pharmacist *subsequent* to graduation from an approved college of pharmacy,

in a pharmacy approved by the Board for such purpose.

"5 The successful passing of the examination in theoretical subjects confers no rights or privileges upon the applicant in connection with the practice of pharmacy in the State of New Jersey.

"Rules and regulations for the enforcement of the new experience requirement have not been made, but they will be made with great care and will be announced in due course. It is important for future applicants in New Jersey to note that until July 1, 1936, the present requirements of four years of practical experience with an allowance not to exceed two calendar years for work completed in an approved college of pharmacy, will remain in effect. Applicants who take the examination after July 1, 1936, will be permitted to qualify for the theoretical tests immediately after graduation. They may acquire as much practical experience as they desire before or during their college course but in every instance they must present, in addition, one full calendar year of experience obtained in accordance with the rules of the Board in a pharmacy approved for practical experience by the Board.

"It is self evident that every type of drug store or pharmacy in existence under the laws of the state is not a satisfactory place for acquiring practical experience. The determining factors which will qualify stores as satisfactory places for acquiring practical experience will be announced in due course."

OKLAHOMA HEALTH EDUCATION

The Oklahoma Pharmaceutical Association's program seeks to cooperate with the State Medical Society. It plans health education and coordinates pharmaceutical merchandising.

EDITORIAL NOTES

THE 1935 CONGRESS OF PHARMACY

Dr J J Hofman, president of the International Pharmaceutical Federation, has expressed the hope that the Federation will be able to count on a large attendance. This, indeed, seems probable, since side by side with this assembly there will be held a few days later an International Congress of Pharmacy, in which not only the members of the Federation will be able to participate, but every pharmacist and indeed every person interested in pharmacy whether as a science or as a profession. The general assembly of the International Pharmaceutical Federation will be held on July 29th and 30th and the International Congress from July 30th to August 6th.

ANNUAL REPORT FOR 1934 OF CENTRAL NARCOTICS INTELLIGENCE BUREAU, EGYPTIAN GOVERNMENT

The reports of the Central Narcotics Intelligence Bureau speak for careful study of the important subject of narcotic addiction and the efforts made to correct the conditions. Evidently from the report, drug addiction has been reduced. The number of arrests, the methods of smuggling and the kinds of narcotics used by addicts are carefully reported, specific cases are detailed as to the evidence for conviction and the punishments assessed. The narcotics reported on differ in the several tables, most of them include cocaine, morphine, heroine, opium, hashish manzoul and "other narcotics." Manzoul consists of a mixture of hashish dry spices and herbs and under "other narcotics" there are various mixtures with chocolate. Other lists report on the occupations represented, ages, nationalities, etc.

Chapter IV is entitled "A New Plague in Egypt" and the name is "Black Tea." It can never be foretold what may become an addiction and affliction, and therefore—because the use of tea seems now to be extensively misused, whereas before the war the use was limited and not in the manner which makes it more or less of a menace—reference is made. The reporter admits of the probable usefulness of tea as a beverage when properly prepared, but the harm is in the concentrated decoction from tea leaves or tea dust boiled in the water, and re-boiled with further additions of tea, adding more tea leaves and water from time to time. This produces a heavy brown, bitter mixture

which through its constricting and irritating properties is deleterious, producing indigestion and aggravating disorders such as ulcers and hyperacidity, septic absorption and the nervous effects of toxic infection. Additions are made of powdered nutmeg, date palm, etc., but the concentrated tea is the basis of the beverage and the ill effects, the tea drinker eventually prefers the beverage to food.

MEMBERSHIP PRIZES IN THE A P H A

Massachusetts College of Pharmacy through members of the faculty has presented as prizes the following memberships in the AMERICAN PHARMACEUTICAL ASSOCIATION

Arthur M Thompson, Organic Chemistry Award, offered by Treasurer Gammon, Nicholas Kafalas, Materia Medica, awarded by President Glover, Richard C O'Leary Pharmacy Prize, offered by Professor LaPierre, Commercial Pharmacy, Walter J Lusinski awarded by Vice President Ellis, Analytical Chemistry, awarded to Elie J Hudon, offered by Dean Theodore Bradley

Recommendation to membership in and one year's dues to the AMERICAN PHARMACEUTICAL ASSOCIATION has been awarded to several students at the College of Pharmacy of the State University of Iowa for high scholarship

Dean Teeters' prize for excellence in pharmacognosy was won by John X. Power, '35, Newton, Iowa

Professor Cooper's prize to the highest ranking student in manufacturing pharmacy was awarded to William B Day, '36, Davenport, Iowa

Nicholas W Solonen won the Scherling prize for highest rank in organic chemistry. This prize is given by Mrs Scherling of Sioux City in memory of her husband. Mr Solonen also won Professor Kuever's prize for excellence in operative pharmacy. This prize is one year's subscription to the JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

PERSONAL AND NEWS ITEMS

Industrial and Engineering Chemistry celebrated the 65th birthday of Prof Reid Hunt, former president of U S Pharmacopoeial Convention

¹ Member, A P H A from 1884 until his demise in 1933

Pharmacists from all parts of the state gathered May 13th, in the Connecticut College of Pharmacy, to take part in ceremonies centered about the unveiling and presentation of a steel engraving of the late P J Garvin to the college. The ceremonies were simple and proved very impressive, with Miss Alice-Esther Garvin, daughter of the late Mr Garvin, unveiling the engraving. Among the speakers were Thomas E Nugent, William J Coughlan, Hugh P Berne and Curt P Wimmer. Dean Henry S Johnson accepted the engraving in behalf of the college.

Our honorary member, William Mair, contributed an article in the May 18 1935, issue of the *Chemist and Druggist* relating to the A P H A, the Stabler-Leadbeater Apothecary Shop and the conditions in American pharmacy.

George P Forrester, of the *Chemist and Druggist*, has discontinued editorship of the *Chemist and Druggist* and is taking up an appointment with the Imperial Chemical Industries.

Dr Wm F Notz, dean of the Georgetown University School of Foreign Service and internationally known economist, died June 4th, at his residence in Washington. Dr Notz was the son of Dr F W A Notz, a pioneer Wisconsin educator, Northwestern College, Watertown Wis.

Harold Hutchins has been named managing editor of the *American Druggist*.

Frazer Affleck will entertain the Veteran Druggists and their wives at Deep Cove, Md., on July 2nd.

Walter S Nicklin, Jr, son of our esteemed member in Alexandria, won the Henry E Kalusowski prize, presented by District of Columbia Pharmaceutical Association through George Washington University School of Pharmacy for highest proficiency in pharmacy. Another prize winner is F Royce Franzoni.

At the Commencement of the University of Pittsburgh on June 5th, the honorary degree of "Doctor of Science" was conferred on William A Hamor, assistant director of Mellon Institute of Industrial Research.

Mrs L S Williams, Baltimore, has presented a copy of Boerhaave's *Materia Medica*—a series of prescriptions—London, 1741.

Mrs Mary E Apple (Franklin M.) has donated a volume *Chemical Amusement, a Series of Curious and Instructive Experiments in Chemistry*, by Frederick Accum, London, 1818.

Dean Charles H LaWall, of the Philadelphia

College of Pharmacy and Science, will sail on July 3rd, for Copenhagen to attend a meeting of the Committee upon Uniform Method of Opium Assay, which has been working under the auspices of the Health Committee of the League of Nations since 1931. The chairman of the committee is Dr L Van Itallie, of the University of Leiden. Other members are Dr Yasuhiko Asahina, of Tokyo, Dr H T Baggesgaard-Rasmussen, of Copenhagen, Professor R Eder, of Zurich, Dr A Goris, of Paris, Dr A W K De Jong, of Medan, Netherlands, Professor Erich Knaff-Lenz, of Vienna, and J R Nicholls, of London. Dr LaWall is representing the U S Treasury Department as a pharmaceutical chemist assigned to this special research—*Science*.

Dean LaWall will represent the American Pharmaceutical Association at the International Pharmaceutical Federation and at the Congress of Pharmacy, meeting at Brussels.

President Joseph Sweetman Ames, of Johns Hopkins University, severed his connection with the university at the fifty ninth commencement exercises after 51 years as a member of the faculty, the last six as head of the institution. Isaiah Bowman was announced as Dr Ames successor.

The Philadelphia College of Pharmacy and Science conferred the honorary degree of Master of Pharmacy' on the following: Eli Lilly, Indianapolis, Dr Wm A Pearson, Philadelphia, John M Woodside, Philadelphia.

Prince Malaku Emmanuel Bayen, of Abyssinia, earned the degree of Doctor of Medicine" at Howard University, Washington. He is a nephew of Emperor Haile Selassie. The Prince enrolled as a member of the Medical School several years ago.

Dr Paul Nicholas Leech, secretary of the Council on Pharmacy and Chemistry visited the American Institute of Pharmacy on his return trip from the meeting of the American Medical Association. Pharmacist Generoso Velasquez of the Philippine General Hospital, Dr Jose E Jimenez, chairman of the Board of Pharmaceutical Examiners and Inspectors, Vice President of Colegio Medico-Farmacaceutico de Filipinas, Vice-President of Philippine Pharmaceutical Association and owner of Farmacia San Fernando in Manila were among recent visitors, also Walton A Hill of Veterans Hospital, Tuscaloosa, and John A Purinton, Jr, Detroit, Mich.

Prof Harold W Werner will continue research in chemotherapy in the Department

of Pharmacology of the University of Wisconsin

HUGO DE VRIES

Hugo de Vries, world famous botanist, died May 21st, at his home near Arnheim, Holland, aged 87 years

Professor de Vries was born at Haarlem in 1848. He earned his degree in natural science at Leyden in 1870, and continued his studies at Wurzburg and Heidelberg, specializing in botany and also studied chemistry. He was appointed to the University of Amsterdam in 1878 and a lecturer at Halle. His great work was done in connection with the development of the theory of mutation as a method of evolution, and it was along these lines of study and research that De Vries earned his place as a leading world scientist.

He published "Intracellular Pangenesis" in 1889, in which he differed from Darwin. The "Mutation Theory" appeared in 1901, "Plant Breeding" in 1907, and other works followed. For about forty years Professor De Vries was director of the Amsterdam Botanical Gardens and member of the faculty of the University of Amsterdam, after his retirement he issued a collection of his writings, which had been separately published or contributed to scientific publications. He declined invitations to faculties of other universities.

ENCOURAGING THE USE OF NARCOTICS

A special correspondent of the *New York Times* reports that "inside the city of Changli there is only one shop that sells narcotics, but outside the city walls there are thirty six shops of which twenty two are owned by Japanese and fourteen by Koreans, selling heroine, morphine and opium quite openly. Throughout the county of Changli there are 163 shops selling these narcotics to Chinese of the demilitarized zone. The first time a customer enters one of these shops he is charged five cents for his purchase. The price rises as the customer becomes addicted."

DOHME PORTRAIT PRESENTATION

The oil portrait of the late Charles E. Dohme, president of the AMERICAN PHARMACEUTICAL ASSOCIATION, 1898-1899, formerly president of the Maryland College of Pharmacy, the forerunner of the School of Pharmacy, University of Maryland, which was given to the institution last October by Dr.

A. R. L. Dohme, was officially presented to the school May 31st. Other speakers were Dr. D. M. R. Culbreth, Dr. Thomas S. Cullen and Charles C. Neal, of Sharp & Dohme.



CHARLES E. DOHME

Dr. A. G. DuMez, dean of the school, acted as master of ceremonies. The portrait was accepted by Dr. Raymond A. Pearson, president of the University of Maryland.

'THE CULTURE OF WHOLE ORGANS'

The above is the title of a paper by Dr. Alexis Carrel and Charles A. Lindbergh which was received as most important research, whereby the means may be afforded for seeing the process of making the hormones and witness the results of their productions and also, how organs succumb to disease.

We are very willing to honor Dr. Carrel for the valuable contributions he has made to medical science, but the participation of Colonel Lindbergh in discoveries add greatly to medical science and are beyond estimation. They speak for his observations and application of them.

The article referred to describes a new method by which 'an organ can be taken out of the body of an animal and kept alive for study under glass the chemical equivalent of a blood stream being supplied by an arti-

ficial heart The organs were handled by Dr Carrel, the mechanical heart was constructed by Colonel Lindbergh"

In 1931 the latter designed a rotating coil of glass to substitute for the heart as a blood

pump, he is credited with inventing a spore-catcher, which he attached to his plane to ascertain how much vegetable life exists in the upper stratus

SOCIETIES AND COLLEGES

CANADA PHARMACEUTICAL ASSOCIATION

Canada Pharmaceutical Association will meet in Victoria B C August 5th-8th, the AMERICAN PHARMACEUTICAL ASSOCIATION will convene in Portland, Oregon, August 5th-10th The two associations meet in the same section and thus offers an opportunity for interchange of visitations

SECTIONS AND CONFERENCES PAPERS AT THE PORTLAND MEETING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

The list of officers may be found in the roster for your convenience the names of the presiding officers and secretaries are here given Scientific Section, *Chairman*, E V Lynn, Massachusetts College of Pharmacy, Boston, *Secretary*, F E Bibbins 5840 Washington Blvd, Indianapolis, Ind Section on Education and Legislation, *Chairman*, Oscar E Russell, 531 So Main St Elkhart Ind *Secretary*, L W Rising, University of Washington, Seattle, Wash Section on Practical Pharmacy and Dispensing, *Chairman*, H M Burlage, University of North Carolina Chapel Hill, N C, *Secretary* Leon W Richards University of Montana, Missoula, Mont Section on Commercial Interests, *Chairman*, Henry Brown, Scranton, Pa, *Secretary* R T Lakey Cass & Hancock Aves Detroit Mich Section on Historical Pharmacy, *Chairman*, C O Lee Purdue University, La Fayette Ind, *Secretary*, H W Youngken, Massachusetts College of Pharmacy Boston, Mass, *Historian* E G Eberle, 2215 Constitution Ave Washington D C

National Conference on Pharmaceutical Research, *Chairman*, E N Gathercoal, 710 So Wood St, Chicago, Ill, *Secretary* John C Krantz Jr 2411 No Charles St Baltimore Md Conference of Pharmaceutical Association Secretaries, *President*, F V McCullough New Albany Ind *Secretary* Carl G A Harring 20 Glen Road Newton Center,

Mass Conference Pharmaceutical Law Enforcement Officials, *Chairman*, R L Swain 2411 No Charles St, Baltimore Md *Secretary*, M N Ford, New State Office Building Columbus Ohio Plant Science Seminar, *Chairman*, Frank H Eby, 240 Powell Road Springfield, Pa, *Secretary* F J Bacon Western Reserve University, Cleveland, Ohio

American Association of Colleges of Pharmacy, *President*, Ernest Little, Rutgers University College of Pharmacy, Newark, N J, *Secretary* Zada M Cooper, University of Iowa, College of Pharmacy, Iowa City Ia, *Chairman of Executive Committee*, C B Jordan Purdue University, La Fayette Ind

National Association of Boards of Pharmacy, *President*, C H Evans, Warrenton Ga, *Secretary*, H C Christensen, 130 No Wells St, Chicago Ill

PROGRAM OF NATIONAL CONFERENCE ON PHARMACEUTICAL RESEARCH 1935 MEETING

PORTLAND, OREGON, SATURDAY, AUGUST 3
HOTEL MULTNOMAH

First Session 2 00 P M

- 1 Call to Order by Chairman
- 2 Appointment of Nominating Committee
- 3 Summary of Year's Activities and Outlook of Conference for the Future, by Chairman Gathercoal
- 4 Reports of Officers
 - a Report of Secretary
 - b Report of Treasurer
 - c Report of Executive Committee by Secretary
- 5 Reports of Standing Committees
 - (1) Physical Chemistry, Arthur Osol *Chairman*
 - (2) Bacteriology and Immunology, Louis Gershenfeld, *Chairman*
 - (3) Pharmacognosy Heber W Younglen *Chairman*
 - (4) Pharmacology and Bioassays, James C Munch, *Chairman*

- 6 Roll Call of Delegates
- 7 Adjournment for dinner Arrangements will be made for a dinner for the delegates assembled

An address pertinent to the work of the Conference will be delivered

Evening Session 8 00 P M

- 8 (5) Medicinal Chemicals, Joseph Rosin, *Chairman*
- (6) Endocrinology, Arthur Grollman, *Chairman*
- (7) Manufacturing Pharmacy, L Wait Rising, *Chairman*
- (8) Pharmaceutical Dispensing, William J Husa, *Chairman*
- (9) Educational Methods, A B Lemon, *Chairman*
- (10) Pharmaceutical Economics, Harry S Noel, *Chairman*
- (11) Historical Pharmacy, Charles H LaWall, *Chairman*
- 9 Reports of Other Special Committees
- (1) Publications, Edward N Gathercoal, *Chairman*
- (2) Census of Research, James C Munch, *Chairman*
- 10 General Discussion of the Status of Pharmaceutical Research
- 11 Election and Installation of Officers
- 12 Adjournment

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

The pharmacy program of the American Association for the Advancement of Science is printed in the April JOURNAL A Ph A, page 338 The pharmaceutical organizations of Australia and New Zealand join in the program of the Association for the Advancement of Science of these countries in Section O Pharmaceutical Science The program in Minneapolis on June 27th, was part of Section N (Medical Sciences) and Section N3 (Pharmacy)

AMERICAN MEDICAL ASSOCIATION

The house of delegates of the American Medical Association at its annual meeting in Atlantic City, adopted a resolution which would make the Association a monitor of all radio broadcasting on the subject of medicine heard by the American people regardless of whether the broadcasts originate in this country or in foreign nations

Opposition to the Copeland pure food bill

was expressed in two resolutions They were referred to committees

After four successive years of evading the issue, the Association officially recognized the problem of birth control

A resolution was adopted, providing for the appointment of a special committee by the board of trustees, to study the problem of birth control during the next year and present at least a preliminary report on it at the annual meeting of the house of delegates of the Association in 1936

A preamble to the carefully worded resolution stated that nothing in it was to be interpreted as "a declaration of action either for or against birth control"

OFFICERS OF AMERICAN PHARMACEUTICAL MANUFACTURERS' ASSOCIATION

The following officers of the American Pharmaceutical Manufacturers' Association were unanimously elected

President George R Flint, Decatur, Ill, *First Vice President*, Carroll Dunham Smith Orange, N J, *Second Vice President*, J C Fausnaught, Worcester, Mass, *Secretary*, C W Warner, Newark, N J, *Treasurer*, Frank A Mallett Des Moines, Iowa, *Members of Board of Directors*, three-year terms Carl N Angst, Indianapolis Eliot Frosst, Montreal Quebec, and R Lincoln McNeil Philadelphia two year term (to fill vacancies) R L Maltbie, Newark N J and E T Kirkland Decatur, Ill

DAIRY, FOOD AND DRUG OFFICIALS MEET

The Central Atlantic States Dairy, Food and Drug Officials held their 19th annual convention at the John Marshall Hotel in Richmond on May 14th and 15th The meeting was well attended and was presided over by Major W Catesby Jones of the Chemistry Division of the Virginia Department of Agriculture The gathering was addressed by Governor Peery and by Mayor Bright of Richmond and a number of interesting addresses were delivered by members in attendance These dealt with foods, seeds, fertilizers seafood, insecticides drugs and cosmetics President R P Fischelis, of the AMERICAN PHARMACEUTICAL ASSOCIATION delivered an address on Drug Control by the States

The following resolution was presented and adopted

WHEREAS the 19th Annual Conference of the Central Atlantic States Association of Dairy, Food and Drug Officials held at Richmond, Va., on May 14 and 15, 1935, has been one of the most pleasant and inspiring in the entire experience of the Association, and

WHEREAS at this time our thoughts turn to those who in various ways participated to make our Conference successful,

Be It Resolved that this Association extend in this manner their appreciation to Dr. Robert P. Fischelis for the excellent paper on "Regulations of the Manufacture and Distribution of Drugs and Medicines in the Interest of the Consumer" presented by him, and

Be It Further Resolved that a copy of this resolution be spread upon the Minutes of the 19th Annual Meeting of the Association and a copy be forwarded to Dr. Robert P. Fischelis

ANDREW J. KROG, *Chairman,*
Resolution Committee

F. L. WOLLARD,
W. BROWNLEY FOSTER, M. D.

ALABAMA

Dr. James S. M. Lester, president of the American Medical Association, Dr. L. S. Blake, head of the Pharmacy Department, Alabama Polytechnic Institute, and Dr. A. R. Bliss, Jr., were among the speakers at Alabama Pharmaceutical Association, held in Birmingham, June 19th-20th

ILLINOIS

Among the speakers of the Illinois convention at Quincy were E. F. Kelly, Samuel C. Henry, Samuel Shkolnik, Carl Weeks. The following officers were elected: *President*, Howard H. Zorn, Springfield, *First Vice-President*, Edward J. Merriman, Joliet, *Second Vice-President*, Joseph Allegrette, Chicago, *Third Vice-President*, W. E. Brown, Quincy, *Secretary*, William B. Day, Chicago, *Treasurer*, A. W. Reinhardt, Rockford

LOUISIANA

Endorsement was given to a fair trade act, to be introduced in the next legislature. The following officers were elected: *President*, A. J. Bourdreaux, Opelousas, *Vice Presidents*, Joseph Clesy, New Orleans, M. Kurtley, Washington, Henry Richardson, Shreveport, Eugene Voght, Ferriday, John E. Guess, Hammond, Roy Bridges, Alexandria, *Recording Secretary*, Joseph H. Berner, New Orleans, *Corresponding Secretary*, Paul Weilbacher, New Orleans, *Treasurer*, Elmo D. Ciro, New Orleans

TEXAS

Texas Pharmaceutical Association elected the following officers

President, C. C. Harris, Houston, *First Vice-President*, B. B. Brown, Dallas, *Second*

Vice-President, Festus A. Pierce, Corsicana, *Secretary-Treasurer*, W. J. Danforth, Fort Worth. *Members of the Executive Committee*, Henry F. Hein, San Antonio, E. B. Oliver, Longview, Shine Phillips, Big Spring, Murray Thames, Beaumont, Roy Pool, Amarillo

Secretary Walter D. Adams was elected editor of *Texas Druggist* and the publication was changed from a quarterly to a monthly

Among the speakers of the convention were Charles E. Turner, Mayor of Dallas for a number of terms and a former druggist, now finance director for the Texas Centennial Central Exposition, Representative R. L. Reader, H. L. Chichester, Macon, Ga., N. A. R. D. vice president, and Tom Roach of Oklahoma City

The Veteran Druggists' Association held its annual session, presided over by President A. H. Seely

WEST VIRGINIA

West Virginia Pharmaceutical Association held its annual meeting at Parkersburg, June 17th and 18th. Among the speakers scheduled were R. L. Swain, John Dargavel and State Senator G. O. Young

FLORIDA

The Florida Pharmaceutical Association was successful in point of attendance and program. A feature of the convention was the University Hour and tribute to Dr. James H. Beal

The following officers were elected: *President*, Victor Wray Haines City, *First Vice-President*, George Taylor, Miami Beach, *Second Vice-President*, George H. Grommet, Miami, *Third Vice-President*, R. L. Gaddy, Tallahassee, *Secretary-Manager*, Max S. Adler, Tampa, *Place of Meeting*, West Palm Beach. Time, 1936

A speaker of the convention was Dr Robert C Wilson, dean of the School of Pharmacy, University of Georgia, on the subject of "The Sale of Drugs in Drug Stores." Other speakers were Drs P A Foote, Townes R Leigh, C G Hamilton and B V Christensen.

The words of tribute honoring Dr James H Beal were delivered by H C Shuptrine, a former president of the N A R D An honorary life membership in the Florida Pharmaceutical Association and a beautiful desk set were presented to the honored guest who responded in expressions of appreciation and gratitude.

GEORGIA

The following officers were elected by Georgia Pharmaceutical Association

President, R Lee Olive, Augusta *First Vice President* H S Peters, Manchester *Second Vice President*, J W Brinson, Wrights ville, *Third Vice President*, W W Fincher, Canton, *Secretary Treasurer* Z O Moore Atlanta Macon was selected as the convention city in 1936

A resolution was passed expressing regret because of the absence of W S Elkin, Jr

H S Noel and John W Dargavel were among the speakers of the convention

Expression of appreciation was given to the AMERICAN PHARMACEUTICAL ASSOCIATION and Secretary E F Kelly, for their part in the National Drug Trade Code, also to Secretary John W Dargavel who was present at the meeting and appreciation was expressed because of the service rendered by that organization

NORTH CAROLINA

Dr Howard E Rondthaler President of Salem College, Winston Salem, was one of the principal speakers at the annual meeting of North Carolina Pharmaceutical Association His address was well received and devoted largely to the interests of North Carolina and neighbor states Tribute was paid to F W Hancock, veteran Oxford druggist, who has attended fifty-four out of the fifty six conventions of North Carolina Pharmaceutical Association W C Porter, an uncle of O Henry, made a brief address The following officers were elected

President, R A McDuffie, Greensboro, *First Vice President* W C Ferrell Nashville, *Second Vice-President*, E C Adams, Gastonia, *Third Vice-President* R P Rogers Durham, *Secretary Treasurer* J G Beard Chapel Hill,

Members of the Executive Committee J C Hood, Kinston, I W Rose, Chapel Hill, E E Thomas Roxboro

SOUTH CAROLINA

Timely addresses were features of the South Carolina convention Among the speakers of the convention were H S Noel, D W Daniel of Clemson College, and J H Landess of Memphis

The following officers were elected for the ensuing year *President*, V F Platt Conway, *First Vice President* L A Melchers, Jr Charleston *Second Vice President*, P C McCollum Clemson College, *Third Vice President* T H Turner, Columbia *Secretary Treasurer*, J M Plaxco Due West

Myrtle Beach was chosen for the convention city in 1936

(To be continued)

NATIONAL DRUG CODE AUTHORITY

The former members of the National Drug Code Authority met June 8th for the purpose of taking steps to wind up the affairs of that organization There were present J A Goode, Wheeler Sammons J W Dargavel and E F Kelly The accounts of the organization were submitted for proper audit

The files, records and papers of the Authority were turned over to Secretary E F Kelly for a period of one year and then to the American Institute of Pharmacy for such historical use as can be made of them

Liberty is taken in quoting from *Drug Topics*, of June 10th by R L Swain

"(NRA) has made a lasting contribution to decent business and public morals The codes imperfect as they were, recognized the necessity of team-work and cooperation Business has learned that good wages, humane hours and fair attitude toward competitors are not only attainable but highly desirable NRA has added vastly to the heart and soul of business as a whole It has been a boon to retail pharmacy

"What are the facts? First of all the code recognized the need for price stabilization in the drug field The cost definition was the very principle which decent business fought for in the Capper Kelly Bill and it is the identical principle underlying the Fair Trade acts This open recognition on the part of the government is a priceless gain

"Then, too the code proved that reasonable price regulation is in the interest of the consumer Drug products declined in price under the code A legitimate profit can be made without adding to the cost of living and is beneficial to all The cost definition is complete proof that price stabilization is sound business practice "

The wholesale group, on December 6th, conferred with the Federal Trade Commission for the purpose of studying practices that are the major causes of unfair and unethical competition (See December JOURNAL 1934, page 1252) Reference is made because the discussion emphasized principles that are basic in fair practice

UNIVERSITY OF MARYLAND SCHOOL OF PHARMACY

The following completed their work in the Graduate School of the University of Maryland and were awarded the Doctor of Philosophy degree Samuel W Golstein L Lavan Manchey, Emanuel Veritus Shulman and Frank J Slama They have been members of the teaching staff of the School of Pharmacy

Two former graduates of the School of Pharmacy were honor men in the School of Medicine—George Frederick Schmitt, Jr, received the University Prize Gold Medal, Edward Francis Cotter received the second Certificate of Honor and the Dr A Bradley Gaither Memorial Prize for the best work in genito urinary surgery during the senior year Fourteen other members of the graduating class of the School of Medicine were graduate pharmacists The Master of Science degree was conferred on Charles F Brueing and Louis L Sherman, who completed the major part of their work in the School of Pharmacy Governor Nice of Maryland was the principal speaker at the commencement exercises of the University The degree of Doctor of Laws was conferred on the Governor

A large bequest to the University of Maryland Medical School was made in the will of the late Dr Frank P Bressler of Baltimore The sum is estimated at considerably over \$1,000,000 00

DUQUESNE UNIVERSITY

Dr H V Army, dean of the College of Pharmacy of Columbia University, was guest speaker at Duquesne University School of Pharmacy The subject of his address was entitled ' Five Times Ten Years in Pharmacy, '

in which he gave a short résumé of the personalities and the work of former presidents of the AMERICAN PHARMACEUTICAL ASSOCIATION and a pithy exposition of true professional pharmacy as it is, as it can be and as it should be in the days that are to come

An oil painting of Dean Hugh C Muldoon was presented by the students and graduates and accepted by President Callahan

CORVALLIS SCHOOL OF PHARMACY

Oregon State Daily Barometer, of May 24th, devotes the greater part of a page to the School of Pharmacy, its dean, faculty and activities

TEMPLE UNIVERSITY

Temple University, Philadelphia, has announced the establishment of a biological field station at Quaker Bridge N J, for the use of Summer school students taking courses in field botany and field zoology, sessions will continue until August 9th

OKLAHOMA PHARMACY ALUMNI ELECT OFFICERS

Jess W Stunkle, of Enid, has been elected president of the Oklahoma Association of Graduate Pharmacists, to succeed Everett E Duncan, who was recently elected president of the Oklahoma State Pharmaceutical Association

Other officers are C V Nichols, of Anadarko, and Leonard Reynolds of Tulsa, *Vice-Presidents*, Mrs J E Wyly, Spavinaw, *Secretary*, and Guy Scroggs, Tulsa, *Treasurer*

Members of the executive council are the officers and Miss Ina Griffith, Apache, James Hamilton, Holdenville, R H Mays, Duke, E E Duncan, Oklahoma City, G M Pearce Drumnright, Harlan Fuller, Minco, and John Helvey, Lawton

THE COPELAND BILL

The Senate passed the Copeland Bill It has been referred to the Interstate and Foreign Commerce Committee of the House of which Congressman Sam Rayburn is the chairman The latter has stated that if no substantial opposition to the bill develops, the committee will take it up

HOTEL RATES AT PORTLAND

The rate at Multnomah for one person is \$2 50 and up, shower bath, tub \$5 00, two persons \$4 00 and \$8 00 The Imperial has a

rate from \$1 50 up Garage service \$3 00 per week Among other large hotels are Benson, Carlton, Congress, Heathman, Mallory, New Heathman and Portland

James L. O'Neill, a vice president of the Guaranty Trust Company of New York,

has assumed the office of Administrator of the new NRA He started work as an office boy with Bradstreet, for twenty two years he was with Carnegie Steel Company and became associated with the Guaranty Trust Company in 1918

NOTICE TO CONTRIBUTORS TO THE JOURNAL AMERICAN PHARMACEUTICAL ASSOCIATION

The following notice has been prepared from comments received from members of the Board of Review of Papers and of the Publication Committee

Manuscripts should be sent to Editor E. G. Eberle, 2215 Constitution Ave., N. W., Washington, D. C.

All manuscripts should be typewritten in double spacing on one side of paper $8\frac{1}{2} \times 11$ inches, and should be mailed in a flat package—not rolled The original (*not* carbon) copy should be sent The original drawings, not photographs of drawings should accompany the manuscript Authors should indicate on the manuscript the approximate position of text figures All drawings should be marked with the author's name and address

A condensed title running page headline not to exceed thirty-five letters, should be given on a separate sheet and placed at the beginning of each article

The method of stating the laboratory in which the work is done should be uniform and placed as a footnote at end of first page, giving Department, School or College The date when received for publication should be given

Numerals are used for figures for all definite weights, measurements, percentages and degrees of temperature (for example 2 Kg, 1 inch 20.5 cc, 300° C) Spell out all indefinite and approximate periods of time and other numerals which are used in a general manner (for example one hundred years ago, about two and one half hours, seven times)

Standard abbreviations should be used whenever weights and measures are given in the metric system, e. g., 10 Kg, 2.25 cc, etc The forms to be used are cc, Kg, mg, mm, L and M

Figures should be numbered from 1 up, beginning with the text-figures (line engravings are always treated as text-figures and should be designated as such) and continuing through the plates The reduction desired should be clearly indicated on the margin of the drawing All drawings should be made with India ink preferably on white tracing paper or cloth If coordinate paper is used, a blue lined paper must be chosen Usually it is desirable to ink in the large squares so that the curves can be more easily read Lettering should be plain and large enough to reproduce well when the drawing is reduced to the width of a printed page (usually about 4 inches) Photographs intended for half tone reproduction should be securely mounted with colorless paste

"Figure" should be spelled out at the beginning of a sentence, elsewhere it is abbreviated to "Fig.," per cent—2 words

The expense for a limited number of figures and plates will be borne by the JOURNAL expense for cuts in excess of this number must be defrayed by the author

References to the literature cited should be grouped at the end of the manuscript under the *References* The citations should be numbered consecutively in the order of their appearance (their location in the text should be indicated by full sized figures included in parentheses) The sequence followed in the citations should be Author's name (with initials), name of publication volume number, page number and the date in parentheses Abbreviations for journals should conform to the style of *Chemical Abstracts* published by the American Chemical Society

(1) Author, A. Y., *Am. J. Physiol.* 79: 289 (1927)

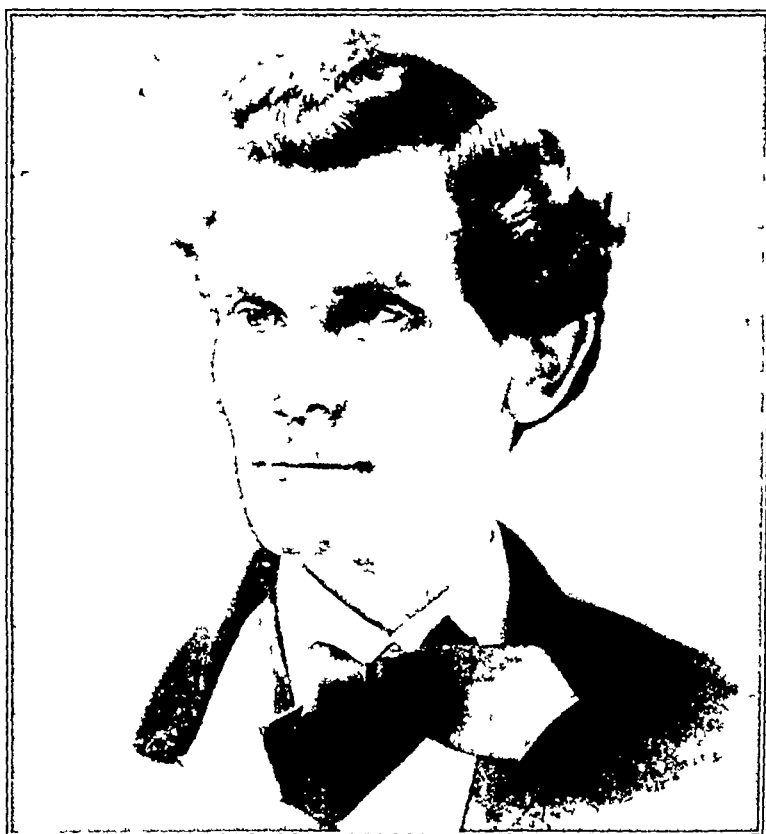
Papers presented at the Sections of the AMERICAN PHARMACEUTICAL ASSOCIATION's annual meeting become the property of the ASSOCIATION and may at the discretion of the Editor be published in the JOURNAL Papers presented at these Sections may be published in other periodicals only after the release of the papers by the Board of Review of Papers of the JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

The Editor will appreciate comments from Board of Review and Committee on Publication members, authors and others interested



An inspiring vista of the Columbia River and Gorge as seen from the Columbia River in Oregon Saturday, August 10th, will be an all-day scenic drive up Columbia River Highway, including a visit to the Bonneville Dam and an out-door luncheon featuring Columbia River salmon

If you have not planned for your trip to the Portland meeting of the A P H A you should do so promptly



John Ingalls.

JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

VOL XXIV

JULY 1935

No 7

1885-1935

The 33rd annual meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION was held in Pittsburgh Pa , September 8, 1885 It was at this meeting that the third contribution on 'Precipitates in Fluidextracts' was presented by our senior member, J U Lloyd We now know the value of that research in pure and applied science Dr A B Prescott in commenting on this work said, 'The series of papers has been of great value,' he considered the work "a notable example of the fact that true research is reported from the field of applied science as well as that of pure science "

Mention is made of the foregoing, because during the more than sixty years our senior member served this ASSOCIATION he carried the message of pharmacy to the public, and by his writings and other activities the fact has never been permitted to dim that he was and is a pharmacist

John Ingalls, pharmacist of Macon, Ga , president of the AMERICAN PHARMACEUTICAL ASSOCIATION in 1885, was born in New Bern, N C , in 1829 where he received his earlier education and later engaged as clerk in a drug store Upon attaining majority he removed to Charleston, S C , and thereafter was engaged in a pharmacy in Columbia, first as clerk and then as proprietor In 1860, he became proprietor of a Macon, Ga pharmacy, until his death November 12 1898

Mr Ingalls was a courtly polished gentleman of the old school, and of unusual moral and physical courage He always endeavored to promote pharmacy, and gave his fellows a deeper appreciation of the profession and a high valuation of its service He took an active part in association work and served as president of Georgia Pharmaceutical Association Before his election as president of the A P H A , Mr Ingalls held vice presidential offices and afterward became a member of the Council

THE OREGON TRAIL

The Oregon Trail was an emigrant route about 2000 miles in length from Independence, Mo , to the Columbia River Originally, like many of the main roads of the country, it was made in some parts by Indians and trappers A part of it was blazed by Verendrye in 1742 and the expedition of Lewis and Clark in 1804

EDITORIAL

E G EBERLF, EDITOR

2215 Constitution Ave., WASHINGTON, D C

AFTER EIGHTY-THREE YEARS—PORTLAND

WHEN the AMERICAN PHARMACEUTICAL ASSOCIATION was organized, Oregon had not yet reached Statehood Its influence upon pharmacy in the great Pacific Northwest preceded its formal contact with the pharmacists of that delightful section of our country by eighty-three years We have enjoyed and profited by the influence of pharmacists of the West and Northwest for many years They have served as officers and committee members in the AMERICAN PHARMACEUTICAL ASSOCIATION and have taken active part in its major activities However, it remains for the 1935 Convention of the ASSOCIATION to cement by personal contact the bonds of friendship and professional relationship which have been fostered over the years between the pharmacists of the Northwest and the general membership of the ASSOCIATION

To many pharmacists of the Northwest the AMERICAN PHARMACEUTICAL ASSOCIATION has been largely a symbol, albeit an intangibly important factor in the progress of their profession Comparatively few have had the opportunity of actually participating in the deliberations of Sections and General Sessions Both the ASSOCIATION and the individual pharmacists of the Northwest have been losers through this lack of personal contact

It is significant that in these days of rapid change in our social and economic structure with its inevitable effect upon the future of the profession of pharmacy and the drug industry, the center of interest will be shifted momentarily from Washington, D C, to Portland, Oregon It will be a good thing for those engaged in the management of the affairs of the ASSOCIATION to gaze at the usual center of their activity from a distance of several thousand miles, and experience the advantages of the background of those who are for geographic reasons always several thousand miles distant from Washington Undoubtedly we of the East shall learn a great deal, and if in the learning we may also be privileged to impart a point of view and, perhaps, some specific information on some of the problems that confront us, our profession as a whole will profit measurably by the opportunity for interchange of opinions thus afforded

Pharmacy is beset by many problems and the economic situation has greatly intensified some of them We must face these problems squarely and we must solve them with courage and intelligence We expect the Pacific Northwest to supply the type of inspiration which carried the pioneers to the great heights that built an empire where once there was barrenness and waste We look forward to Portland with eager anticipation The eighty-third annual convention should make history —ROBERT P FISCHER, *President*, A PH A

CONTRIBUTORY PROFESSIONAL SERVICE

THE reports on Drug Extraction are being continued and in connection with the fundamental principles of the methods the extraction of a series of drugs of different types is being studied The subject has received consideration from

every angle and brings to the pharmacist a knowledge and understanding of the general processes of drug extraction

Several papers have recently dealt with the methods of drug administration and most careful observation has been made of the promptness with which certain forms of medications are effective and in that connection the value or insufficiency, usefulness or unfitness of certain administration forms

The determination of the reasonable or permissible margin of error in dispensing has been made the subject of comprehensive and detailed experimentation and research for a number of years and important information has been added to the records relative to utensils, apparatus and skill which may influence variation. The physical properties of the liquid, suspension or powder to be dispensed or compounded in the prescription have been carefully studied

Other points of prescription practice in articles of recent issues of the JOURNAL have reported the accuracy and speed factors in the filling of capsules by hand, the rate of disintegration in medicinal tablets and the variance of hypodermic tablets

Thus pharmacists owe much to their fellows in cooperative endeavors, and the contributors to the work of the AMERICAN PHARMACEUTICAL ASSOCIATION have promoted pharmacy and, because of the research, medicine, pharmacy, the laity and the profession have benefited

These thoughts have come forward, because each year the annual meetings carry messages and convey information which add to the sum and substance of knowledge and advance the cause of the profession and individuals therein engaged

The pharmacist profits by the information he communicates to his fellows and thereby advances the profession. What will your contributions be to the programs of the sections this year?

THE BLUE EAGLE AND THE NRA

JAMES L. O'NEILL, acting chief of the recovery agency, has indicated that there probably will be a continuation of the "Blue Eagle," perhaps as insignia of merit for industries carrying forward a certain standard

President Roosevelt has made it known in the press conferences that all matters pertaining to voluntary business agreements to replace the codes will be handled by the Federal Trade Commission. James L. O'Neill, recently appointed acting NRA Administrator, has stated that his organization will devote its activities largely to the compilation of the history of the two years of life and to gathering information, the "archives division" is in charge of Leon C. Marshall. Several proposed NRA bills are still under consideration but it is doubtful if they will be enacted into law during this session of Congress

The "Fair Trade Acts" are gradually being shaped to serve a most useful purpose, and with proper understanding and a determination to bring about what is intended, it is hoped, will result in helpful state measures, coordinated with other states in legalizing contracts which will establish a minimum price as an economic principle, and bring the public to a realization that price-cutting is destructive to seller and buyer, and that the effect is being impressed by untoward results, whereby the group or individual suffers

SCIENTIFIC SECTION

BOARD OF REVIEW OF PAPERS — *Chairman*, F E Bibbins, George D Beal, L W Rising, H M Burlage, L W Rowe, John C Krantz, Jr, Heber W Youngken

DRUG EXTRACTION III THE FUNCTION OF PRELIMINARY MACERATION IN RELATION TO THE PERCOLATION OF BELLADONNA ROOT ^{1 2}

BY WILLIAM J HUSA³ AND S B YATES⁴

As a part of the general study of the fundamental principles of drug extraction, which is being carried out in the Department of Pharmacy of the University of Florida, some of the factors influencing the extraction of belladonna root have been studied. The work reported in this paper deals with the function of maceration, both before and after packing the drug in the percolator, in relation to the percolation of belladonna root.

HISTORICAL REVIEW

Variations in U S P Percolation Methods—Since the introduction of the process of percolation in the U S P of 1840, changes have been made in the time of maceration.

TABLE I—VARIATIONS IN TIME OF PRELIMINARY MACERATION IN U S P PERCOLATION METHODS

U S P	Time of Maceration	
	Before Packing	After Packing
1840	24 hours	0
1850	0 to 14 days	0
1860	0	0
1870*	0	4 days
1880	0	48 hours
1890	0	48 hours
1900	0	48 hours
1910*	6 hours	48 hours
1920*	6 hours	48 hours

* Type processes are given

Moistening and Maceration before Packing—The moistening and preliminary maceration of a drug is one of the established steps in percolation. According to Couch (1) the purpose of preliminary maceration is to assist in packing, to allow a modification of the drug constituents and to insure the saturation of every particle of drug with menstruum so that the actual percolation may affect all the drug evenly.

In 1833 the Boullays, father and son (2) recommended that the drug be packed dry in the percolator. Dausse (3) in 1836 suggested that the powdered drug be moistened with half its

¹ Presented before the Scientific Section, A P H A, Washington, D C, 1934

² This paper is based on a thesis presented to the Graduate Council of the University of Florida by S B Yates in partial fulfilment of the requirements for the degree of Master of Science in Pharmacy

³ Head Professor of Pharmacy, University of Florida

⁴ Holder of a University of Florida Graduate Scholarship, 1933-1934

weight of cold water, and allowed to macerate for several hours before introducing it into the apparatus for extraction. In 1841 Deane (4) stated that no further maceration was required than might be necessary to complete the swelling process. Procter (5) recommended maceration before packing when using aqueous or weakly alcoholic menstrua, but not when percolating with alcohol or ether. In 1889 J U Lloyd (6) advocated that, in percolation with hydro alcoholic menstrua the drug be macerated with water alone and that the alcohol necessary to bring the menstruum up to the proper strength be added just before packing.

In 1904 experiments were reported from Greenish's laboratory by Hooper (7) who moistened 200 Gm portions of belladonna root with 50, 100- and 150-cc portions of menstruum. It was found that extraction was most rapid when 50 cc of menstruum was used to moisten 200 Gm of drug. Later experiments by Todd (8) in which 100 Gm of belladonna root in No 40 powder was packed dry, and further 100-Gm portions moistened with 50 cc and 100 cc respectively of menstruum, showed that most rapid extraction resulted from dry packing.

Bennett and Cocking (9) stated that "It is generally agreed that in small scale operation percolation proceeds more evenly and consequently a drug is exhausted more quickly when a relatively small quantity of menstruum is used to moisten it."

Recently the purpose and necessity of the moistening and maceration of the drug prior to packing has been questioned by W L Scoville (10).

Maceration after Packing in the Percolator—In 1864 Procter (11) approved of long maceration after packing the drug in the percolator. Likewise, Savage (12) in the same year showed by experiments with calumba, catechu, cinchona, cinnamon, gentian, myrrh, opium and rhubarb that long maceration produces a much more saturated first percolate. Campbell (13) in 1869 stated that the process of percolation is dependent on the important step of maceration. He moistened and packed the drug and allowed it to macerate for 4 days in a conical percolator previous to percolation. Taylor (14) in 1869 carried out experiments which indicated that long maceration was an important requirement for thorough and complete exhaustion of a drug by percolation.

Vacuum Maceration—In 1869 Duffield (15) advanced the idea that a more perfect maceration could be obtained if the ground drug were placed in a strong cylinder, the air pumped out and the requisite amount of menstruum admitted. He stated that the pores of the comminuted drug give up the air enclosed in them and when the menstruum is allowed to flow in it is forced into these pores by the pressure of the air outside."

EXPERIMENTAL PART

The drug used was from a 125 pound shipment of belladonna root previously described (16).

Variation in the Amount of Moistening Liquid—Comparative percolations were carried out on 100 Gm portions of belladonna root in No 40 powder using varying amounts of menstruum for moistening the drug, but keeping all other factors as nearly constant as possible. The U S P process for the preparation of the fluidextract was followed, using the menstruum of alcohol five volumes—water one volume, but with the variation that 80 cc of reserve percolate was set aside in each case and further percolates collected in successive 100 cc portions. The quantities of menstruum used in moistening the various 100 Gm portions of the drug were as follows: 0, 25 cc, 60 cc and 90 cc. Otherwise the U S P details were followed, *i e*, the drug was allowed to macerate for 6 hours before packing in the percolator and 48 hours after packing. The successive percolates were collected without interruption.

TABLE II—EFFECT ON PERCOLATION OF THE AMOUNT OF LIQUID USED IN MOISTENING BELLADONNA ROOT FOR PRELIMINARY MACERATION

A. Gm of Alkaloid in Various Portions of Percolate				
Percolates	0 *	25 Cc *	60 Cc *	90 Cc *
80 cc	0.411	0.434	0.460	0.281
100 cc	0.030	0.026	0.054	0.164
100 cc	0.004	0.008	0.006	0.006
100 cc	0.000	0.000	0.000	0.000
100 cc	0.000	0.000	0.000	0.000
Totals	0.445	0.468	0.520	0.451

* Quantity of menstruum used in moistening 100 Gm of drug for preliminary maceration

B Gm of Total Extractive Contained in the Various Percolates				
Percolates	0 *	25 Cc *	60 Cc *	90 Cc *
80 cc	11 19	10 05	8 38	7 55
100 cc	8 41	8 43	8 95	7 45
100 cc	2 40	3 10	3 63	4 02
100 cc	0 95	1 24	1 54	1 99
100 cc	0 59	0 65	0 78	1 09
Totals	23 54	23 47	23 28	22 10

* Quantity of menstruum used in moistening 100 Gm of drug for preliminary maceration

C Per Cent of Total Alkaloid Contained in

Quantity of Menstruum Used for Moistening 100 Gm of Drug	First Percolate	First 2 Percolates	First 3 Percolates
0	92 4	99 1	100 0
25 cc	92 7	98 3	100 0
60 cc	88 5	98 9	100 0
90 cc	62 3	98 7	100 0

The results in Table II indicate that the rate of extraction of alkaloid is equally rapid when no liquid is used for moistening and when 25 cc is used for 100 Gm of drug. Using 60 cc there is a slight reduction in yield of alkaloid in the first percolate and using 90 cc there is a material reduction. In each case all the alkaloid is contained in the first 280 cc of percolate. The yield of total extractive in the reserve percolate varies inversely with the quantity of moistening liquid used.

The Function of Maceration before and after Packing in Relation to Percolation of Belladonna Root—The object of the following experiment was to determine the effect of varying the time of maceration, both before and after packing in the percolator on the rate of extraction of belladonna root.

100 Gm portions of belladonna root in No. 40 powder were percolated by the U. S. P. method for the preparation of fluidextract of belladonna root but varying the time of maceration as will be indicated, 80 cc of reserve percolate was collected in each case in ten hours and set aside, after which successive portions of 100 cc of percolate were collected three hours being taken for collection of each portion. In each case 60 cc of menstruum was used for moistening 100 Gm of drug.

TABLE III—EFFECT OF TIME OF MACERATION ON THE PERCOLATION OF BELLADONNA ROOT IN No. 40 POWDER

A Gm of Alkaloid in Various Percolates when Maceration Was as Follows				
Percolates	0-0 *	0-24 *	0-48 *	24-48 *
80 cc	0 387	0 419	0 396	0 417
100 cc	0 081	0 072	0 064	0 065
100 cc	0 010	0 009	0 009	0 094
100 cc	0 000	0 000	0 000	0 000
100 cc	0 000	0 000	0 000	0 000
Totals	0 478	0 500	0 469	0 576

B Gm of Total Extractive Contained in Various Percolates				
Percolates	0-0 *	0-24 *	0-48 *	24-48 *
80 cc	8 64	8 30	8 26	10 39
100 cc	7 63	7 64	7 74	7 47
100 cc	3 71	3 58	3 60	2 69
100 cc	1 61	1 62	1 82	1 32
100 cc	0 85	0 80	0 92	0 55
Totals	22 44	21 94	22 34	22 42

C Per Cent of Total Alkaloid Contained in

Hours of Maceration Before Packing	Hours of Maceration After Packing	First Percolate	First 2 Percolates	First 3 Percolates
0	0	81 0	95 8	100 0
0	24	83 8	98 2	100 0
0	48	84 4	98 1	100 0
24	48	85 8	99 6	100 0

* The first number indicates the hours of maceration before packing in the percolator and the second number shows the number of hours of maceration after packing

The results in Table III clearly show that in the case of belladonna root in No 40 powder maceration either before or after packing is not of appreciable value in promoting rapid extraction of alkaloids. The total extractive is higher in the reserve percolate in the batch that was macerated before and after packing, this advantage almost disappears by the time the fourth percolate is collected.

The Effect of Variations in Preliminary Maceration—100 Gm portions of belladonna root in No 40 powder were subjected to varying types of preliminary maceration as will be indicated. The drug was then packed in the percolator and percolation conducted immediately. In each case 80 cc of percolate was collected in four hours after which successive 100-cc portions were collected in two hour periods. The variations in preliminary maceration were as follows:

Sample A The drug was macerated with 60 cc of the official menstruum for 6 hours before packing in the percolator.

Sample B The drug was macerated for 6 hours with water equivalent to 60 cc of the official menstruum, the alcohol necessary to bring it up to the official menstruum strength being added just before packing.

Sample C A flask containing the drug was evacuated for 3 hours, using a Cenco Hyvac pump. Sixty cc of the official menstruum was then added through a separatory funnel placed through the stopper, the flask being shaken until the powder appeared uniformly damp. The mixture was macerated for 6 hours. The drug was then packed and percolated immediately.

TABLE IV—EFFECT OF VARIATIONS IN PRELIMINARY MACERATION ON THE PERCOLATION OF BELLADONNA ROOT IN NO 40 POWDER

Perco- lates	A Gm of Alkaloid in Various Portions of Percolate			B Gm of Total Extrac- tive Contained in		
	Sample A	Sample B	Sample C	Sample A	Sample B	Sample C
80 cc	0 382	0 378	0 406	8 55	7 31	8 18
100 cc	0 074	0 094	0 065	7 25	7 33	7 22
100 cc	0 009	0 008	0 007	6 22	5 38	6 53
100 cc	0 000	0 000	0 000	3 62	4 61	4 40
100 cc	0 000	0 000	0 000	2 47	2 54	2 18
Totals	0 465	0 480	0 478	28 11	27 17	28 51

C Per Cent of Total Alkaloid Contained in

Sample	First Percolate	First 2 Percolates	First 3 Percolates
A	82 2	98 1	100 0
B	78 8	98 3	100 0
C	84 9	98 5	100 0

The results in Table IV indicate that preliminary maceration with water alone, with subsequent addition of alcohol, has little or no advantage over maceration in the usual manner. Vacuum maceration also appears to offer no particular advantage, as far as present results go. The results show that slightly more alkaloid is extracted by vacuum maceration in the first percolate than by the usual method of maceration. However, all the alkaloid is contained in the first 280 cc in each case.

DISCUSSION OF RESULTS

The results obtained in the present investigation show that dry packing works equally as well as moistening with 25 cc of liquid per 100 Gm of drug, but that extraction is slower with larger quantities of moistening liquid. Hooper's results (7) agree with these in showing that quantities above 25 cc decrease the rate of extraction. Todd's results (8) agree with these in showing that dry packing gives more rapid extraction than moistening with large proportions of liquid, but as Todd did not try any quantities of moistening liquid between 0 and 50 cc per 100 Gm of drug he failed to discover that moistening with small proportions of menstruum did not hinder extraction. The lack of advantage in moistening the drug verifies Scoville's contention (10) that the 6 hours of maceration before packing is not needed on account of rate of solubility or to allow time for osmosis. It would seem that in the case of powdered drugs which swell only slightly in the menstruum used the preliminary maceration serves no useful purpose.

In regard to the results on the quantity of moistening liquid used, it is interesting to note that similar results have been found for other drugs. Thus Lenton (17) found that in the percolation of coca leaves, on reducing the amount of menstruum used for moistening the drug, more than half of the alkaloid was obtained in the reserve percolate, while with the official British Pharmacopœial quantity of moistening liquid, the greater part of the alkaloid was contained in the "weak percolate." His results on *cimicifuga* and *aconite* were similar.

The previous workers in this field have failed to explain why an increase in the amount of moistening liquid decreases the rate of extraction. Considering the results in Table II it may be said that several factors have a bearing on the results. When no moistening liquid is used, it is evident that all of the liquid appearing as reserve percolate must traverse the entire column of drug. But when the drug is moistened before packing the result is that when percolation is started most of the liquid used in moistening reaches the bottom of the percolator without passing through the entire column of drug. When 90 cc of moistening liquid is used and 80 cc of reserve percolate collected it is obvious that more than 10 cc of the moistening liquid is still in the percolator when the reserve is set aside, and the portion remaining in the percolator is that which has traversed the greatest distance through the drug. However, when only 25 cc of moistening liquid was used, extraction of alkaloid was just as efficient as when the drug was packed dry. This would indicate that small quantities of moistening liquid may become rather fully saturated so that nothing would be gained by passing through more of the drug. But when more moistening liquid is used than can become saturated, the reserve percolate is less concentrated. From Table II, Part B, it is possible that certain easily soluble extractives dissolve in a very small amount of moistening liquid so that even 25 cc of moistening liquid results in dilution as far as these constituents are concerned, since the total extractive in the reserve percolate is reduced even by 25 cc of moistening liquid.

It is interesting to note that maceration after the liquid has begun to drop from the percolator is of very little benefit in the percolation of belladonna root with the official menstruum. This result is in accord with Huser and Magid's findings (16) that equilibrium is quickly attained in maceration with an excess of liquid. The results cast considerable doubt on the necessity and wisdom of the 48-hour macera-

tion period after packing as specified in the U S P X type processes A, B and C for fluidextracts. In the present tests, the results with 19 hours of percolation were equally as good as with 91 hours of combined maceration and percolation. This saving of time is of importance. J U Lloyd (18) found that percolation without maceration was best for the preparation of fluidextract of *cimicifuga*. It remains to be seen whether maceration in connection with percolation is important for other drugs. Probably the most logical way for the U S Pharmacopœial Revision Committee to handle this problem would be to introduce a type process for percolation without any maceration either before or after packing. This type process could be specified for only those drugs which are found from time to time to be extracted equally as rapidly and completely without maceration as with maceration.

SUMMARY

Percolation experiments indicate that maceration before or after packing is of no advantage in promoting more rapid extraction of powdered belladonna root. When the amount of moistening liquid is not kept down to a low proportion there is a decrease in rate of extraction. No advantage is apparent in (a) vacuum maceration, or (b) preliminary maceration with water alone, with subsequent addition of alcohol.

REFERENCES

- (1) Couch, *Am J Pharm*, 92 785 (1920)
- (2) Boullay and Boullay *J pharm chim* [2], 19 281 (1833)
- (3) Dausse cited by Soubeiran *Bull gen de Therap*, through *Am J Pharm*, 8 221-228 (1837)
- (4) Deane *Pharm J* 1 61-68 (1841-1842)
- (5) Procter, *Am J Pharm* 31 317-324 (1859)
- (6) Lloyd J U *Drugg Circ* 33 200 (1889)
- (7) Hooper Elsie S *Pharm J* [4], 19 140-142 (1904)
- (8) Todd F J, *Pharm J*, 119 31 (1927)
- (9) Bennett and Cocking, "Science and Practice of Pharmacy," Vol 1, page 118 (J and A Churchill London)
- (10) Scoville W L, *JOUR A PH A*, 21 877 (1932)
- (11) Procter, *Am J Pharm* 36 1 (1864)
- (12) Savage, *Pharm J* 24, 254 (1864)
- (13) Campbell *Am J Pharm* 41 385-388 (1869)
- (14) Taylor, A B *Proc A PH A*, 17, 390-395 (1869)
- (15) Duffield S P Letter to Editor *Am J Pharm* 41, 2-4 (1869)
- (16) Husa and Magid *JOUR A PH A* 23, 891 (1934)
- (17) Lenton, W H *Pharm J* [4] 16, 389 394 and 457 (1903)
- (18) Lloyd, J U, *Am J Pharm*, 50 1-15 (1878)

PHYTOCHEMICAL NOTES *

NO 113 AN UNUSUAL PEPPERMINT OIL

BY SISTER M FRANCIS LAVIER

As a preliminary to the study of a number of *Mentha* materials, largely hybrids of which only small amounts were available, a lot of about 370 cc of peppermint oil

* From the Laboratory of Edward Kremers

1930, was examined The oil had been distilled by A J Schwarz and E Bailie, August 11, 1930, from material harvested from the strain of *Mentha piperita* L which has been raised in the Pharmaceutical Garden of the Wisconsin Pharmaceutical Experiment Station for a number of years under the direction of Professor W O Richtmann

In October 1931, the oil had acquired a decided orange tint, was cloudy and had deposited a resinous sediment Nevertheless, the odor was still pleasant though penetrating After the physical and chemical constants had been determined, the bulk of the oil was rectified by steam distillation, 307.8 Gm yielded 269.8 Gm of practically colorless rectified oil, or a yield of 87.6 per cent The aqueous distillate, approximately three liters, was twice cohobated, yielding 6.7 cc and 4.0 cc, respectively, of oil Added to the original rectified oil, the total amounts to 279.62 Gm or 90.8 per cent There remained, therefore, 9.2 per cent of non-volatile resinous material in the distillation flask The acid value of this resin, recovered from the dried ethereal solution, was found to be 3.1, 2.6 and 2.7, respectively, in three determinations So far as determined, the physical and chemical constants of the three oils are herewith tabulated

	Crude Oil	Rectified Oil	First Cohobate
<i>d</i>	0.9620 at 25°	0.9145 at 27°	0.9179 at 25° (1)
<i>n_D²⁰</i>	1.4721	1.4700	
α_D in 100 mm tube	-32°	-9.42°	
Acid value	0.6		
Ester value	23.5 and 22.4	28.2	
Percentage ester	8.5% and 8%	10.1%	
Combined menthol	6.39%	7.8%	
Total menthol	55.40%	45.3%	
Free menthol	49.01%	37.5%	

Inasmuch as the U S P states that the density of the official oil may vary between 0.896 and 0.908 at 25°, the oil must be regarded as an unusual product Letters were, therefore, sent to the A M Todd Company of Kalamazoo, Mich., and to Fritzsche Bros of N Y City inviting their comments The Michigan distillers asked for a sample of the oil which was sent The replies of both firms are herewith quoted with running comments in the form of foot-notes To the data reported by the A M Todd Company the U S P requirements were added in the table to admit of ready comparison

'We do not think the sample is true *Mentha piperita*, as we know it, and its odor strongly suggests to us some type of horsemint (2) It resembles to some extent oils raised in Oregon and Washington from *Mentha piperita* but the constants are quite different than anything purporting to be Oil of *Mentha piperita* we have ever examined We assayed a part of the sample you sent to us and below we give you both the analysis of your own oil and an average analysis of 1930 crop Peppermint raised in Michigan

	Your Sample	Average 1930 Crop	U S P Requirement
Optical rotation	-7.62/25°	-25.50/25°	Varies between -23° and -33°/25°
Specific gravity	0.9166/25°	0.9001/25°	0.896 to 0.908/25°
Solubility	Insoluble in 70% alcohol Soluble in 1:1 vol 80% alcohol	3 vol 70% alcohol 4 vol 70% alcohol slightly opalescent	Soluble in 4 vol 70% alc showing not more than a slight opalescence and no separation of oil globules

Ester	10 72%	7 8%	Not less than 5%
Total menthol	41 65%	52 7%	Not less than 50%
Refractive index	1 4705/20°	1 4620/20°	1 4600 to 1 4710/20° C

"The temperature at which the Optical Constants have been taken is indicated You will note a difference of about two points (0 002) in the Specific Gravity you quote, 0 9145/27°, and the Specific Gravity our laboratory indicates (3) In checking Gravity in our laboratory a pycnometer is used and a correction of 0 00075 is calculated per 1° C in temperature Refractive Index we find to be a dependable Constant and it seldom, even on very weedy (4) Peppermint, runs as high as 1 4630/20° I think we have never seen a sample purporting to be Oil of Peppermint with as high a Refractive Index as the sample you submitted nor as low Optical Rotation If the oil is true *Mentha piperita*, it is most abnormal in all respects "

Fritzsche Brothers returned two opinions the first from the Clifton Chemical Laboratory, Clifton, N J , the second from the Chemical Laboratory of Schimmel & Co Milititz b Leipzig, Germany Both are herewith quoted

' The Peppermint Oil to which Prof Kremers refers appears to be quite an unusual product While the oils of 1930 generally have been higher in density than in former years, ρ_{20}^4 , 0 900 to 0 904, we never had any above 0 905

"The keeping quality was very good, three samples from different sources showed a rise in density of only one point in the third decimal in each case after one year s standing "

' Wir bestaetigen Ihnen den Empfang Ihres Schreibens vom 6 d M und haben auf die Ausfuehrungen von Herrn Prof Kremers zu bemerken, dass wir in den letzten drei Jahren an amerikanischem Pfefferminzoeel spezifische Gewichte bis zu 0 905 (25°/25°) beobachtet haben das will aber bei der verhaeltnismaessig geringen Anzahl von Oelen, die wir untersucht haben, nicht viel besagen und schliesst keineswegs aus, dass auch hoehere spezifische Gewichte vorgekommen sind Jedenfalls halten wir ein spez Gewicht von 0,911, wie es Herr Prof Kremers an einem von ihm selbst destillierten Oel festgestellt hat nicht fuer zu hoch, da nach den vorliegenden Beobachtungen bei amerikanischem Pfefferminzoeel tatsaechlich spezifische Gewichte bis zu 0,915 und darueber vorkommen Dass der von der U S Ph angegebene obere Grenzwert von 0,908 zu niedrig ist, haben wir bereits bei Besprechung des amerikanischen Arzneibuchs erwaeht (Report 1926, 139) und gehen heute sogar noch einen Schritt weiter indem wir als obere Grenze nicht 0 910 sondern 0 915 vorschlagen

"Die Zunahme, die das spezifische Gewicht des in Rede stehenden Oels innerhalb Jahresfrist erfahren hat (von 0 911 auf 0 962), ist allerdings ziemlich gross und laesst auf starke Verharzung schliessen, die ja auch in dem hohen Rektifikationsrueckstand (12%) zum Ausdruck kommt So starke Verharzungen kommen bei Pfefferminzoeel besonders dann vor, wenn das verarbeitete Kraut sehr frisch gewesen ist, weil in diesem Fall leicht verharzende Bestandteile in das Oel hineingelangen, die bei vorherigem Trocknen des Krauts durch den Sauerstoff der Luft schnell in nicht fluechtige Harze ueberguehrt und dadurch unschaedlich gemacht werden (5) Es soll damit nicht ohne weiteres behauptet werden dass dies hier der Grund ist, vielmehr kann die Verharzung auch eine reine Zufallserscheinung sein fuer die jede naechere Erklaerung fehlt, denn es ist ja bekannt, dass unter sonst gleichen Bedingungen das eine Oel groessere Neigung zum Verharzen zeigt als das andere, und das wird sich dann im Verlauf eines Jahres immerhin schon recht deutlich bemerkbar machen Eine direkte Anomalie koennen wir selbst in einer starken Verharzung nicht erblicken, und ebensowenig darin, dass das spezifische Gewicht nach der Rektifikation des Oels hoeher bleibt als es urspruenglich gewesen ist, denn die Verharzungsprodukte sind natuerlich z T fluechtig und machen dann begreiflicherweise das Oel schwerer (5) "

In order to acquire a somewhat better insight into the nature of this unusual oil, 130 cc of the rectified product were saponified and the saponified oil distilled with steam The oily distillate (116 cc) was collected in fractions, the volumes and densities of which are herewith recorded

Fraction	Volume	d_{20}°
I	60 cc	0 9060
II	9 cc	0 9174
III	47 cc	0 9112

Thus it becomes apparent that little more than one-half of the saponified oil has a density within the specific gravity limits of the Pharmacopœia. Subjected to fractional distillation, the bulked rectified oil yielded the following results

Fraction	Volume	d_{20}°
-165°	1 0 cc	
165-185°	1 2 cc	0 7646
185-200°	13 0 cc	0 9119
200-220°	63 0 cc	0 9171
220-240°	15 0 cc	0 9144
Residue	12 0 cc	

Again it will be seen that the three larger fractions of the saponified (1) oil have densities greater than those of the pharmacopœial limits

Fraction 200° to 220°, when placed in a freezing mixture, yielded crystals of menthol. Acetylation revealed the presence of 97.8% alcohol computed as menthol.

The absence of thymol and carvacrol has already been pointed out. The quantitative tests for pulegone likewise gave negative results (6).

This unusual oil shows once more how difficult it is to fix standards for volatile oils that will satisfy every one, even though the oil be a rectified product. Had the oil been of lighter density than the official lower limit, such a shortcoming could be corrected, even though with a loss, by the removal of some of the lower fractions. However, inasmuch as the density is too high, a corresponding correction might have involved a loss of menthol and menthol ester, unless the solubility tests reported by Todd indicate the presence of sesquiterpenes that could be removed. Should the peppermint grower find that a large share of his crop yields such an oil as here reported, about the only thing he can do under the present U. S. P. standard is to blend it with other oils that are relatively light.

REFERENCES

(1) The first cohobated oil had separated into two portions: one floated on the aqueous distillate, the other was heavier than water. The latter was discarded after it had been ascertained by means of the Flueckiger test that it contained neither thymol nor carvacrol.

(2) As already stated, the oil had been distilled from plants that have been under cultivation in the Pharmaceutical Garden for a number of years. Inasmuch as both horsemint and wild bergamot have been distilled repeatedly in the same still used for field operations, there was a bare possibility that contamination with the oil of either species of *Monarda* had taken place. However, this was excluded by making a Flueckiger test for thymol and carvacrol. The result was negative.

(3) Applying as correction for the difference in temperatures the factor 0.000755 (Schreiner), the Specific Gravity will be 0.91601/25°. Accordingly, the difference is only 0.00059, when comparison is made at the same temperature.

(4) Contamination with weeds is excluded, since the peppermint is cultivated in rows that are kept free from weeds. Should a single weed plant have been overlooked during the cultivation, this may be expected to have been discarded in the harvest. The Pharmaceutical

Garden has only a half acre experimental field of peppermint, hence, both cultivation and harvest are under rigid control

(5) This explains satisfactorily the large amount of resin resulting upon rectification but does not account for the unusually high density of the rectified oil

(6) Gildemeister, 'Die aeth Oele' (3rd ed), 1, page 560

THE CHEMISTRY OF HEPTANE AND ITS SOLUTIONS * ¹

No 6 THE SOLUBILITY OF THE HALOGENS IN HEPTANE

BY JOSEPH SEMB

The heptane used was that prepared from some of the by-products obtained in the purification of hydrocarbon from Jeffrey Pine oil placed at the disposal of this laboratory in 1927 by the Ethyl Gas Corporation (1) The material employed (2) was first shaken with concd sulphuric acid until no more charring occurred (loss 30 per cent) Next the oil was shaken with fuming sulphuric acid and allowed to stand over night After that it was shaken successively with water, also with aqueous solutions of sodium carbonate, sodium hydroxide and potassium permanganate Finally, it was dried with calcium chloride, refluxed for several hours over metallic sodium and distilled over phosphorus pentoxide The bulk of the oil distilled within two degrees, *viz*

550 cc between 96.8° and 97°

550 cc at 97°

550 cc between 97° and 97.4°, barometric pressure 743 mm The 'Vorlauf' and residue amounted to 200 cc

The chlorine (from a cylinder) used was purified by passing it through aqueous copper sulphate, water, concd sulphuric acid and finally through a calcium chloride tower

The bromine used was Merck's C P article

Merck's U S P iodine was used without additional purification

The dissolved halogen was determined directly with standard sodium thio-sulphate (standardized against potassium dichromate) in the case of iodine In the case of chlorine and that of bromine, the iodine equivalent was set free by the addition of potassium iodide

Bromine Heptane Solution		Iodine Heptane Solution	
Temp	Wt of 5 Cc Aliquot *	Temp	Wt of 5 Cc Aliquot
-78.0°	3.726 Gm	-26.5°	3.495 Gm
-77.0°	3.742 Gm	0.0°	3.475 Gm
[-51.0°	3.963 Gm]	20.0°	3.448 Gm
-44.5°	4.161 Gm	34.5°	3.425 Gm
-34.5°	4.438 Gm	55.0°	3.395 Gm
[-32.0°	4.137 Gm]		
-29.0°	4.724 Gm		
-28.0°	4.777 Gm		
-26.5°	5.066 Gm		

* The accompanying figure shows that the weights determined at -51° and at -32° are off

The above values are plotted on Fig 3

* Scientific Section, A P H A, Madison meeting 1933

¹ From the Laboratory of Edward Kremers

In this work the concentrations are reported in grams of halogen per 100 cc of solution (not solvent). However, the weights of 5-cc aliquots of the saturated bromine and iodine solutions were determined at different temperatures. The data are recorded below. These values together with those reported in subsequent tables makes it possible to calculate the solubilities on the gram or mole fraction basis.

Approximately 5 cc of heptane, placed in a 25-cc graduated cylinder and kept as remote from light as possible, were saturated with chlorine at the temperature stated, by bubbling the gas through the solvent. When the solution was saturated (15 to 30 minutes, depending on the temperature of experiment) the new volume was recorded. This was then diluted with heptane that was colder than the solution. This tended to cut down the amount of chlorine that might otherwise escape during the subsequent steps of transferring and titrating. It also diminished the losses due to reaction between the chlorine and the heptane.

In experiments Nos 12, 13, 15, 16, 18, 20, 21, 24 and 25, Table I, all of the diluted solution was dumped into an Erlenmeyer flask and titrated. It is significant to note that in the above series the low temperature experiments gave low results. The other experiments reported in Table I were carried out somewhat differently. Not only was the original volume of the saturated solution recorded but also the volume of the diluted solution. A 5-cc aliquot of this diluted solution was withdrawn and titrated. From these data the grams of chlorine dissolved in 100 cc of solution were calculated and recorded in column "C," Table I. The values chosen for plotting on Fig 1 are found in column "D."

In Table I, it will be observed that numerous experiments gave low results, particularly so for the low-temperature ones. This is probably due to one or both of two possibilities. Firstly, the solution may not have been saturated to start with, or if it had been, too much chlorine was lost in subsequent operations. Naturally, the higher the concentration of chlorine the more acute this danger becomes. In the second place, as chlorine and heptane do react, and as the increased concentration is favorable to secondary reactions, the discrepancy due to thermal secondary reactions, initiated by a photochemical reaction, should be greater at the higher concentrations of the lower temperatures. Several times, without apparent provocation, the reaction between chlorine and heptane became so violent that the experiment was lost. Usually this took place for the higher concentrations, and then when the gas had been bubbled through for a considerable period. This would indicate that the accumulation of HCl or probably heptyl chloride catalyzes this thermal reaction between chlorine and heptane. The data in column "E," Table I seem to verify these assumptions. Take, for instance, in experiments Nos 5 and 6, the amounts of HCl found were small. Therefore, the low chlorine yield was not due to losses arising from the reaction between the chlorine and heptane, but the solution was probably unsaturated when removed from the saturating chamber.

In experiments Nos 12 and 13, Table I, it will be noted that the amount of chlorine found is low, but that the amount of HCl found ("E") is very high. This would indicate that the heptane had been saturated with chlorine, and that the subsequent reaction between the chlorine and the heptane, with the formation of HCl and the liberation of heat, decreased the chlorine content.

The HCl was determined as follows. After the chlorine had been titrated as stated above the free HCl was titrated with standard NaOH using 1 methylcne blue phenolphthalein indicator. To establish whether $\text{Na}_2\text{S}_2\text{O}_3$ ($\text{H}_2\text{S}_2\text{O}_3$) or $\text{Na}_4\text{S}_2\text{O}_6$ ($\text{H}_2\text{S}_2\text{O}_6$) had any effect on this titration the following experiment was conducted. A solution containing I_2 was titrated with $\text{Na}_2\text{S}_2\text{O}_3$. To this was added 1 cc of HCl solution equivalent to 9.25 cc of 0.0818N NaOH. Three different titrations gave 9.38, 9.35, 9.05 cc of 0.0818N NaOH or an average of 9.26 cc. Hence, for this work at least, the presence of the above named compounds does not hinder the titration of HCl with NaOH.

Taylor and Hildebrand (3) reported the solubility of chlorine in grams per 1 Gm. of solution at 0° to be 0.196, 0.205, 0.210 or an average of 0.2036 Gm. These investigators obtained erratic values at 20° and 40° , therefore they did not report these values. As I have reported my solubilities in grams per 100 cc. of solution an exact comparison is not possible.

When 10 cc. of bromine were added to 10 cc. of heptane, there was but one liquid phase. It is, therefore, assumed that bromine is miscible with heptane at

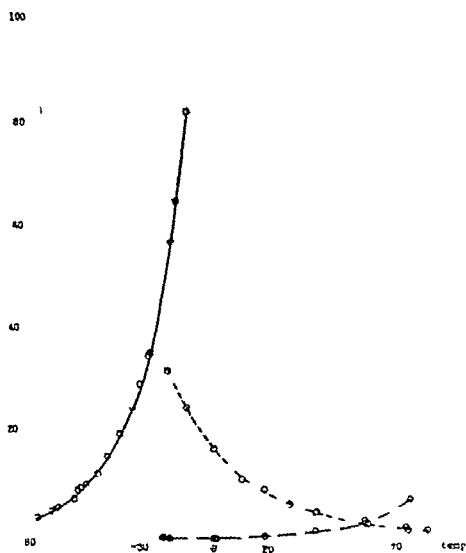


Fig 1 ——— Bromine (unbroken line) — — — Chlorine (broken line) - - - Iodine (dots and dashes)

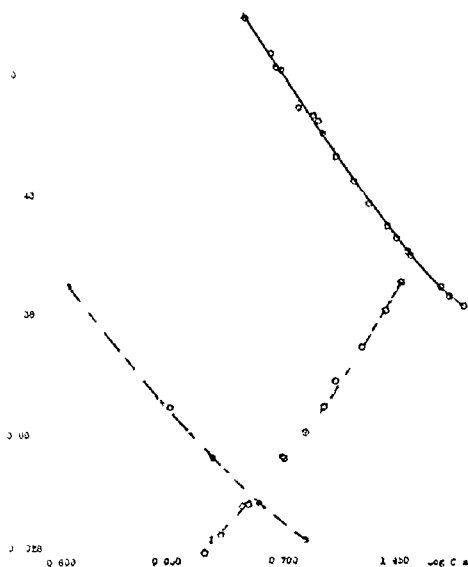


Fig 2 ——— Bromine (unbroken line) — — — Chlorine (broken line) - - - Iodine (dots and dashes)

room temperature. Inasmuch as bromine congeals at low temperatures and melts at -7.3° , the bromine solutions were exposed to low temperatures and the solubility of the halogen in heptane determined. This was done by immersing a solution of bromine in heptane, in a test-tube, into a Dewar flask, cooled to the desired temperature by means of acetone and solid CO_2 . The data obtained are recorded in Table II and plotted on Figs 1 and 2. 2-Cc. aliquots were used in the determinations. The solubility of iodine was determined in a similar manner except that a Dewar flask was not used. The values obtained for iodine are reported in Table III and plotted on Figs 1 and 2.

From Fig 2 it will be noted that for both the bromine and the iodine, plotting $1/T$ against the log of the concentration, gives practically a straight line up to a

certain temperature, whereas in the case of chlorine a distinct curve is obtained. In the case of bromine this temperature is about -40° and for iodine about $+40^{\circ}$. This indicates that the heat of solution of bromine and iodine is practically independent of temperature within this temperature range and that, in the case of the chlorine, the heat of solution varies appreciably with the temperature throughout the range studied.

The molecular heats of solution of iodine, and bromine, in the region where the heat of solution is practically independent of temperature, were calculated by means of the formula,

$$\text{Log } C_2 - \text{Log } C_1 = \frac{Q}{4581} \left(\frac{1}{T_1} - \frac{1}{T_2} \right)$$

C_1 and C_2 are the concentrations, respectively, at temperatures T_1 and T_2 . Q is the heat absorbed, or $-Q$ is equal to the heat of solution. It is assumed that Q remains constant within this temperature range, a condition which is fairly well satisfied in the case of the iodine and bromine. The molecular heat of solution for bromine thus calculated was -4700 calories and for iodine -5940 calories. The molecular heat of solution of chlorine was calculated by the same formula, choosing for T_1 and T_2 20° and 40.5° (Q is not independent of the temperature in this region) and found to be 5200 calories.

The fact that bromine and iodine give a negative heat of solution and chlorine a positive value is accounted for in that heat is required to sublime the iodine and bromine while heat is given off when the chlorine gas is condensed.

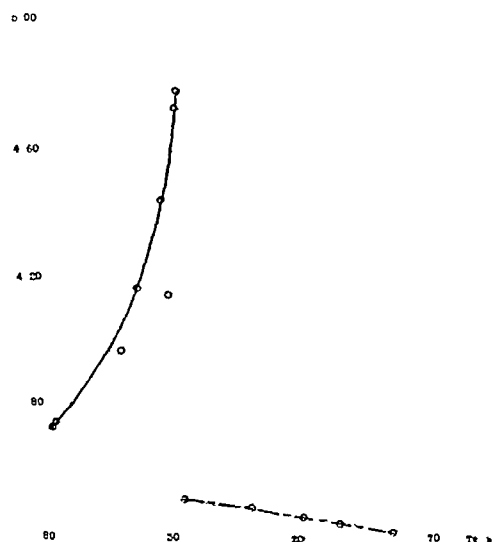


Fig 3 ——— Bromine (unbroken line) --- Chlorine (broken line) - - - Iodine (dots and dashes)

Hildebrand and Jenks (4) report the solubilities of iodine in heptane to be 0.6176, 1.702, 2.491 and 4.196 Gm. per 100 Gm. of solution at 0° , 25° , 35° and 50° , respectively. When Figs. 1 and 3 are greatly enlarged, the solubilities of iodine per 100 Gm. of solution were computed by interpolation to be 0.66 Gm. at 0° , 1.71 Gm. at 25° , 2.39 Gm. at 35° and 4.06 Gm. at 50° .

TABLE I — SOLUBILITY OF CHLORINE IN HEPTANE AT DIFFERENT TEMPERATURES

No (A)	Temperature (B)	Gm. Cl Diss in 100 Cc Sol (C)	Average (D)	Gm. HCl Found in 100 Cc Sol (E)
1	-23.0	29.50		
2	-19.0	32.90	32.9	2.0
3	-12.0	15.50	Omit	
4	-11.0	25.90	25.9	0.13
5	0.0	11.60		0.12
6	0.0	13.61		0.44

7	0 0	16 95		0 38
8	0 0	19 60	17 9	1 05
9	0 0	17 48		0 61
10	0 0	17 39		0 99
11	1 0	10 41		
12	11 0	4 80		2 87
13	11 0	9 74		1 66
14	11 0	11 97	12 00	0 77
15	20 0	3 66		
16	20 0	3 97		
17	20 0	10 11	10 1	0 23
18	30 0	6 14		
19	30 0	7 70	7 7	0 18
20	40 0	5 00		
21	40 0	5 88	5 4	
22	40 0	5 26		
23	40 5	5 60	5 6	0 15
24	60 0	3 30		0 37
25	60 0	2 57	3 17	0 14
26	60 0	3 65		0 14
27	61 0	2 95	2 95	
28	76 0	2 25	2 25	0 03
29	77 0	1 79	1 79	0 15
30	85 0	1 65	1 65	

SUPPLEMENT TO TABLE I—CALCULATION BASED ON TABLE NO. I

Temperature (A)	1/T (Absolute) (B)	Gm Cl per 100 Cc of Sol (C)	Log Conc (C)
-19 0	0 003937	32 9	1 5172
-11 0	0 003817	25 9	1 4133
0 0	0 003663	17 9	1 2529
11 0	0 003520	12 0	1 0792
20 0	0 003413	10 1	1 0043
30 0	0 003300	7 7	0 8865
40 0	0 003195	5 4	0 7324
40 5	0 003188	5 6	0 7482
60 0	0 003003	3 17	0 5011
61 0	0 002993	2 95	0 4698
76 0	0 002865	2 25	0 3522
77 0	0 002857	1 79	0 2529
85 0	0 002793	1 65	0 2175

TABLE II—SOLUBILITY OF BROMINE IN HEPTANE AT DIFFERENT TEMPERATURES

Temperature	1/T (Absolute)	Gm Br in 100 Cc of Sol	Log of Conc
-27 0	0 004067	36 12	1 5578
-39 0	0 004272	20 17	1 3046
-44 5	0 004376	16 12	1 2073
-33 5	0 004176	25 89	1 4130
-26 0	0 004049	36 85	1 5663
-30 5	0 004124	30 08	1 4783
-57 5	0 004641	8 88	0 9484
-56 5	0 004619	9 41	0 9736
-54 0	0 004566	10 06	1 0025
-49 0	0 004464	12 22	1 0871
-15 5	0 003874	66 53	1 8230
-12 0	0 003832	83 49	1 9216

-67 0	0 004854	4 84	0 6848
-69 0	0 004902	4 65	0 6675
-66 0	0 004831	5 43	0 7348
-59 0	0 004673	7 05	0 8482
-75 0	0 005050	3 22	0 5079
-17 5	0 003914	57 99	1 7634

TABLE III—SOLUBILITY OF IODINE IN HEPTANE AT DIFFERENT TEMPERATURES

Temperature	1/T (Absolute)	Gm I in 100 Cc of Solution	Log of Conc
-21 0	0 003972	0 16	-0 7959
-18 0	0 003922	0 22	-0 6576
0 0	0 003660	0 46	-0 3372
1 0	0 003650	0 48	-0 3088
20 0	0 003410	1 01	0 0043
40 0	0 003195	1 93	0 2856
60 0	0 003003	3 85	0 5855
78 0	0 002849	7 79	0 8915
20 0	0 003413	1 00	0 0000

While working with these solutions, it seemed desirable to ascertain something of their reactivity with other elements. In making comparisons, it should be borne in mind that the iodine solution, because of the sparing solubility of this halogen, was but one-fifth as strong, as to molecular equivalent, as were the two other solutions. Moreover, it will also become apparent from some of the reactions to be reported, that the solutions of chlorine and bromine contained some of their hydrides as well, resulting from the action of these halogens on heptane in spite of the precautions taken.

Of the elements of the first group, lithium, sodium and copper (foil) were used. The chlorine and bromine solutions yielded bubbles with both lithium and sodium, indicating the presence of hydrogen chloride and of hydrogen bromide in the respective solutions. After standing over night, the halogen had disappeared completely or nearly so. When a freshly prepared solution of chlorine in heptane, saturated at considerably below 0°, was added to finely powdered copper the two elements reacted with the phenomenon of flame. Upon repeating the experiment with the solution which had been kept in an ice bath for several hours, no such phenomenon occurred. The disappearance of the color of the chlorine showed that it had reacted with the solvent.

The phenomenon of flame is produced when chlorine gas is brought in contact with phosphorus, copper, boron and silicon in powder form. As has been shown, chlorine in heptane solution produces like phenomena with red phosphorus and powdered copper.

The effect of chlorine hydrate upon red phosphorus and powdered copper was also tried, but with negative effect so far as the phenomenon of flame was concerned.

Of the elements of the second group, calcium (lumps), magnesium (turnings), cadmium (lumps) and lead (powder) were tried. Calcium yielded bubbles with Cl and Br, indicating the presence of HCl and HBr, respectively. Mg and Cd apparently were affected but little by Cl. The other two elements seemed to have no effect. Pb decolorized the solutions of all three halogens.

Of the elements of Group three, Al (ribbon) only was tried. With Cl bubbles

were produced Br and I produced a brown, tar-like deposit The I also produced fumes of HI

Of the elements of the fifth group, P, Sb and Bi were used With Cl the P burst into flame immediately as stated in connection with copper The bromine solution was decolorized the next morning, the I sol was partly decolorized Sb decolorized the Cl solution immediately, the Br solution was almost colorless the next morning, the I solution partly decolorized Bi did not seem to react

In several instances colorless crystals were obtained (NaCl , NaBr , SbCl_3), in other instances the bright surface of the metallic element was dulled (in the bromine experiment the Cu became black), in still other instances a tar-like product was deposited (AlBr_3)

It may be of interest to note that of the metallic elements sodium appeared more reactive than lithium, and cadmium more than zinc On the other hand in Group five, P was much more reactive than Sb and Bi Also, that, with the possible exception of Cu, the order of reactivity of the halogens proved to be Cl, Br, I, as was to be expected

* For earlier reports see

No 1, JOUR A PH A, 9, 857 (1920) No 2, *Ibid*, 9, 860 (1920) No 3, *Ibid*, 11, 1042, 1153 (1922) No 4, *Ibid*, 10, 26 (1921) No 5, *Ibid*, 11, 995 (1922)

(1) The principal object was the isolation and identification of the aldehydes See P A Foote, JOUR A PH A, 18, 350 (1929) After shaking out the aldehydes with aqueous sodium acid sulphite from the fractions with a higher boiling point than that of heptane a complex mixture was obtained This was fractionated by C Sondern (*Thesis*, U-W 1928) Of the fractions thus obtained those marked E VII and VIII were employed

(2) Fractions E VII (b p 94.0-94.5°, $d = 0.6800$ at 25°) and E VIII (b p 94.5-95.0°, $d = 0.6815$ at 25.5°) of Sondern, obtained by refractionating the portion of the oil distilling immediately above the boiling point of heptane, were used

(3) Taylor and Hildebrand, *J A C S*, 45, 682 (1923)

(4) Hildebrand and Jenks, *Ibid*, 42, 2180 (1920)

THERAPEUTIC SUBSTANCES DERIVED FROM UNSYMMETRICAL DIPHENYL COMPOUNDS III SOME ARYL ESTERS OF THE HYDROXY DIPHENYLS *

BY S E HARRIS AND W G CHRISTIANSEN ¹

Numerous references have appeared in the literature describing the use of aryl esters of phenol and cresols as urinary and intestinal antiseptics In extending our survey of diphenyl compounds it was decided to prepare a number of aryl esters of 2-, 3- and 4-hydroxy-diphenyls and some of their substitution products

The three hydroxy diphenyls, (*o*-, *m*- and *p*-phenyl-phenol) and their alkyl and halogen substitution products are active, non-toxic germicides and it was hoped that by oral administration in the form of an ester they might reach the urine unmetabolized, and there exert the required germicidal action Fifteen esters were prepared and tested Results of animal experiments definitely show that they possessed no value as urinary antiseptics

* Scientific Section, A PH A, Washington meeting, 1934

¹ Research Department of the Chemical and Pharmaceutical Laboratories, E R Squibb and Sons, Brooklyn, N Y

The tests were carried out upon rabbits, to which the esters, dissolved in olive oil, at a dose level of 20 mg /Kg, were administered orally twice daily for five or six consecutive days. The urine was collected from the second day on and examined for germicidal activity, following in general the procedure of Leonard (1) except that the samples were diluted as required and plated for count immediately after culture, and after 24 hours' contact.

Early results led to the belief that some of the esters possessed activity, but it was later discovered that the urine of the animals varied in activity, and in many cases the urine of untreated controls was germicidal. The variations were correlated with the diet and p_H of the urine, and in later work the p_H was adjusted to 6.5-7.5 (quinhydrone electrode). The effect of p_H adjustment upon the germicidal results is shown in the following tables. 63 urine specimens were collected from rabbits which had been on a uniform diet of hay and oats for some time.

I p_H Distribution

p_H		Below 6.5	6.5-7.5	Above 7.5
No. of urine specimens		23	16	24

II Tested against *B. coli* and *Staphylococcus aureus*

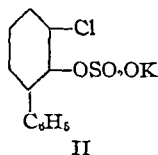
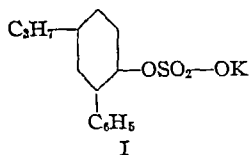
(a) p_H	Below 6.5		6.5-7.5		Above 7.5	
	No of Specimens Tested	No Showing Germicidal Activity	No of Specimens Tested	No Showing Germicidal Activity	No of Specimens Tested	No Showing Germicidal Activity
<i>B. coli</i>	21	8	14	1	22	13
<i>Staph.</i>	21	4	14	1	22	17

(b) p_H	Below 6.0		Above 8.0	
	No of Specimens Tested	No Showing Germicidal Activity	No of Specimens Tested	No Showing Germicidal Activity
<i>B. coli</i>	8	4	18	14
<i>Staph.</i>	8	3	18	16

18 normal urine specimens with p_H below 6.5 or above 7.5 were then adjusted by NaOH or HCl to a value between 6.5 and 7.5. None of these adjusted samples showed any germicidal or antiseptic activity against the test organisms.

Further tests of the esters, in which the p_H of the urine samples was adjusted before test, confirmed the statement made above that the esters were not of value as urinary antiseptics.

Therapeutic activity was expected to result from liberation of the free phenol by hydrolysis of the esters in the body. Phenols, while sometimes excreted in part as glucuronates or even unchanged, are usually metabolized by the potassium salt of their acid sulphuric esters (2). These esters are stable in alkaline but not in acid solutions. The acid sulphuric esters of two of the most active phenols, Potassium 4-*n*-propyl-2-phenyl-phenyl sulphate (I) and Potassium 6-chloro-2-phenyl-phenyl sulphate (II) were prepared, tested *in vitro* and were found to be quite inactive.



In an alkaline or neutral urine such salts as these would represent the condition of phenol, whereas the free phenol would be expected in an acid urine. The absence of germicidal action in acid urines seems to indicate that the esters are not excreted after hydrolysis and combination with sulphuric acid, but that they pass through without material change.

In planning the work which has been outlined, we included one compound not of the diphenyl series—the benzoate of 5,7-dichloro-8-hydroxy-quinoline. It is here included for purposes of record.

EXPERIMENTAL

The several compounds, with their corresponding crystallizing media, their melting points and analyses, are listed in the accompanying table. The esters were prepared by several methods, an example of each being detailed below. Excellent yields were obtained.

1 SCHOTTEN BAUMANN METHODS

3 Phenyl-Phenyl Benzoate—42 Gm *m* phenyl phenol, 43 Gm benzoyl chloride and 50 cc 35 per cent sodium hydroxide were mixed with 150 cc water and shaken mechanically until the odor of benzoyl chloride had disappeared. The precipitated ester was filtered off, washed with water and dissolved in alcohol. Upon spontaneous evaporation of the alcohol the ester was deposited in fine crystals *m p* 57–58° C (corr).

2 ACTION OF ACID CHLORIDE ON THE PHENOL IN A SOLVENT

2 Phenyl-4 Chlorophenyl Benzoate—40 Gm 2 phenyl-4 chlorophenol and 30 Gm benzoyl chloride were dissolved in 200 cc toluene and refluxed until the evolution of hydrochloric acid ceased. The solution was cooled and washed with dilute sodium hydroxide and water. After drying with anhydrous calcium chloride the toluene was removed under reduced pressure and the residue crystallized from methyl alcohol, *m p* 83.5° C (corr).

3 ACTION OF ACID CHLORIDE ON THE PHENOL IN BENZENE WITH POTASSIUM CARBONATE

5,7-Dichloro-8 Hydroxy Quinoline Benzoate—25 Gm 5,7-dichloro-8-hydroxyquinoline, 17 Gm benzoyl chloride and 50 Gm anhydrous potassium carbonate (100 mesh) were dissolved in 250 cc benzene. The mixture was refluxed and stirred for five hours. It was then treated for one half hour with decolorizing carbon and filtered from excess potassium carbonate and potassium chloride. The precipitate was washed with hot benzene and the filtrate and washings combined. They were then washed with 5 per cent sodium hydroxide and with water and dried with calcium chloride. The solvent was distilled off and the residue recrystallized from alcohol, *m p* 129.5–130.5° C (corr).

4 REACTION BETWEEN THE ACID CHLORIDE AND THE PHENOL IN PYRIDINE

2 Phenyl-Phenyl Acetyl Salicylate—14.7 Gm 2 phenyl phenyl salicylate were dissolved in 12 Gm dry pyridine by the aid of heat and the solution cooled in an ice bath. To the resulting suspension 5 Gm acetyl chloride were added dropwise and the reaction completed by warming on the water-bath for thirty minutes. The mixture was then poured upon ice and the resulting sticky product washed with water. It was recrystallized from alcohol until constant *m p* was reached. Consistently low yields of about 40% were obtained.

5 ACID PHENOL AND PHOSPHORUS TRICHLORIDE OR PHOSPHORUS OXYCHLORIDE IN TOLUENE

2-Phenyl Phenyl Benzoate—0.2 mol 2 phenyl phenol and 0.2 mol benzoic acid were dissolved in 400 cc toluene and heated under reflux. The solution was stirred mechanically to promote even boiling. 0.1 mol phosphorus oxychloride was added slowly and the refluxing and stirring continued until evolution of hydrochloric acid ceased. (This varied from three to eight

hours in various cases) The solution was then cooled, decanted from the phosphoric acid, and washed with dilute sodium hydroxide and with water After drying with calcium chloride the toluene was removed under reduced pressure and the residue crystallized from methyl alcohol as prisms, m p 75° C

Preparation of Potassium 4-n Propyl 2-Phenyl-Phenyl Sulphate—16 Gm pyridine were dissolved in 100 cc carbon bisulphide and the solution cooled in an ice bath 12 Gm chlorosulphonic acid were added with good stirring during ten minutes There was formed a crystalline precipitate of the double compound of pyridine and chlorosulphonic acid 21 Gm of 4-n propyl 2 phenyl phenol in an equal volume of carbon bisulphide were then added all at once After heating for one hour on the steam bath the carbon bisulphide was distilled off and 10 per cent potassium hydroxide added until strongly alkaline to litmus The solution was then concentrated and allowed to crystallize The crystals were washed with ice cold water and then with alcohol and dried *in vacuo* The yellow crystalline powder was readily soluble in water and slightly soluble in cold alcohol It decomposed without melting at 180–190° C

Preparation of Potassium 6 Chloro 2-Phenyl Phenyl Sulphate—This salt was prepared by the method described for the corresponding propyl compound It formed a yellowish white crystalline powder which decomposed on heating

Both of these sulphuric esters in water gave practically neutral solutions which slowly developed alkalinity upon standing

Ester	Crystallized from	M P ° C (Corrected)	Sought	Analysis Found	Calculated
<i>2-Phenyl phenol</i>					
Benzoate	Methyl alcohol	75–76	C	82.8	83.2
			H	5.10	5.11
Salicylate	Alcohol	91–92	C	78.1	78.6
			H	4.80	4.83
Cinnamate	Alcohol	103–104	C	83.7	84.0
			H	5.29	5.33
β Resorcyate	Alcohol	185–186	C	74.6	74.7
			H	4.8	4.8
Acetyl Salicylate	Methyl alcohol	71.5–72.5	C	75.0	75.9
			H	4.82	4.83
<i>3-Phenyl-phenol</i>					
Benzoate	Alcohol	57–58	C	81.4	83.2
			H	5.11	5.11
<i>4 Phenyl phenol</i>					
Benzoate	Benzene	148.5–149.5	C	83.0	83.2
			H	5.16	5.11
<i>6-Chloro 2 phenyl-phenol</i>					
Benzoate	Alcohol	86–87	Cl	11.68	11.51
Salicylate	Methyl alcohol	107	Cl	10.77	10.94
Cinnamate	Methyl alcohol	74.5–75	Cl	10.52	10.61
<i>4 Chloro-2-phenyl phenol</i>					
Benzoate	Methyl alcohol	88.5	Cl	11.14	11.51
<i>4 Bromo 2 phenyl-phenol</i>					
Benzoate	Uncrystallizable oil		Br	22.77	22.64
<i>α Chloro 3 phenyl phenol</i>					
Benzoate	Uncrystallized thick oil		Cl	11.38	11.51
<i>2 Chloro-4-phenyl-phenol</i>					
Benzoate	Alcohol	110–111	Cl	11.26	11.51

4-n Propyl 2-phenyl phenol

Benzoate	Petroleum ether	96	C	84 2	83 5
			H	6 35	6 33
Cinnamate	Petroleum ether	72 5	C	84 7	84 2
			H	6 39	6 44

5,7-Dichloro 8-hydroxyquinoline

Benzoate	Alcohol	129 5-130 5	Cl	22 09	22 33
<i>A salt of 4 n-propyl 2 phenyl phenyl hydrogen sulphate</i>		Decomposes			
	Water	180-190	S	9 07	9 69
<i>K salt of 6 chloro 2 phenyl phenyl hydrogen sulphate</i>		Decomposes	S	9 80	9 92
	Water	225-230	Cl	10 29	10 98

The biological tests on compounds reported herein were made in the Biological Research Laboratories of E R Squibb and Sons and we gratefully acknowledge their assistance

SUMMARY

A number of esters of the three phenols and some of their substitution products were prepared and shown to have no value as urinary antiseptics

REFERENCES

- (1) Leonard, V, *J A M A*, 83, 2005 (1925)
- (2) Baumann, *Ber*, 9, 55 (1876)

SALIVA TESTS III DETECTING THE ADMINISTRATION OF SOME OPIUM DERIVATIVES TO HORSES *

BY JAMES C MUNCH ¹

Previous papers in this series (1, 2) report the development of a method for detecting morphine and heroin in the saliva of horses after the subcutaneous or intramuscular injection of known drugs (that is, the investigators knew that the horses had received morphine or heroin at the time tests upon mice were conducted)

TABLE I—THRESHOLDS FOR MOUSE TESTS WITH OPIUM ALKALOIDS

Product	Mg /Kg	10 Med 70% Effective Dose Gamma/20 Gm Mouse
Morphine	4 00	80
Codeine	3 00	60
Dionine	1 00	20
Dilaudid	0 6	12
Heroin	0 05	1

The normal salivas collected from over one hundred untreated horses have been injected into mice, in no instance has an effect been observed resembling that produced by the opium alkaloids. The solution obtained by dissolving morphine or heroin in such a saliva, or in normal horse serum, produced the same effects

* Scientific Section A PH A, Washington meeting, 1935

¹ Sharp and Dohme, Philadelphia, Penna

upon mice as the same concentration in water. The quantities of these drugs producing definite symptoms in seventy per cent of the injected mice (ten or more mice being used on each dose) are given in Table I. In making critical tests, each mouse should be scrutinized before use, as we have found some normal mice tending to show some (but never all) of the symptoms produced by the opium alkaloids. Unless this precaution is taken, misleading results may be obtained.

Since the "doping" of race horses is not permitted by Racing Commissions, it seemed advisable to conduct a series of experiments simulating race-track conditions. Twenty horses were injected subcutaneously with colorless solutions, the composition of which was unknown to the investigators. Gelatin capsules, whose contents were unknown, were administered by mouth to seventeen horses. The general procedure outlined in the first paper of this series was followed.

The saliva was collected from each horse immediately before injection or administration, and at definite intervals afterward (15, 30, 45, 60, 90 and 120 minutes, and sometimes 3 hours and 24 hours). In some instances $\frac{1}{4}$ grain of arecoline hydrobromide was administered or injected. This facilitated the collection of saliva but did not influence the results of the test.

The mouth of the horse was not drenched or washed, but every effort was made to obtain undiluted saliva. The opening of a 5 cc vial was brought in immediate contact with the gingival margins, cheeks and tongue, and the thick slime obtained directly. When the contents were not sufficiently fluid, 1 cc of distilled water was added to each vial and thoroughly shaken with the slime. A volume of 0.5 to 1 cc was then injected into one or more mice weighing about 20 Gm.

TABLE II—SPECIFICITY OF MOUSE TESTS FOR DETECTION OF 'DOPED' HORSES
DRUG SOLUTIONS INJECTED SUBCUTANEOUSLY

Horse No	Weight Kg	Veterinary Deductions	Deductions from Mouse Tests		Product Injected	Treatment of Horse Dose Injected Gamma/Kg	
			Horse Treated	Size Dose		Mg/Horse	Kg
339	560	Excitable	No		Water		
372	455	Normal	No		Water		
341	455	Normal	Yes	Small	Morphine	100	220
340	520	Excited	Yes	Large	Morphine	200	380
380	465	Normal	Yes	Small	Heroin	2	4
379	450	Excited	Yes	Large	Heroin	4	9
371	445	Normal	Yes	Large	Heroin	6	13
342	435	Normal	Yes	Small	Heroin	6.5	15
343	430	Excited	Yes	Large	Heroin	6.5	15
347	420	Refractory	Yes	Large	Heroin	15	36
346	475	Very excited	Yes	Large	Heroin	50	105
377	480	Normal	Yes	Small	Codeine	25	50
378	495	Normal	Yes	Large	Codeine	100	200
374	410	Normal	Yes	Large	Codeine	200	490
375	445	Normal	Yes	Small	Dilaudid	2	5
370	455	Stimulated	Yes	Large	Dilaudid	4	9
382	465	Stimulated	Yes	Large	Dilaudid	6	13
349	445	Stimulated	Yes	Large	Dilaudid	10	22
352	510	Stimulated	Yes	Large	Dilaudid	40	79
345	455	Stimulated	Yes	Large	Dilaudid	100	220

The effects upon the mice were noted over a period of half an hour although positive reactions usually developed within ten to twenty minutes. In some instances injected mice died over night, but no relation could be established between death and the drug administered. In some tests in which the saliva was obtained by swabbing the horse's mouth, and diluting to approximately

300 cc with water, unsatisfactory results were obtained, the amounts of the active substances in the saliva had been too greatly diluted. Such samples must be concentrated by suitable chemical methods before testing.

The solutions and the capsules were prepared by a member of the laboratory (A Q) and given code numbers. This worker retained the code and took no part in the administration or mouse testing. Based upon our observations upon mice, an attempt was made to answer two questions: (1) Do the mouse tests on the salivas from a horse suggest that the animal has been "doped?" (2) If "doped," was a large or a small amount of drug administered?

After we recorded our opinions as to "doping" and dose, contact was reestablished with A Q and the code consulted for the first time. The detailed data of these tests are given in Tables II and III.

TABLE III—SPECIFICITY OF MOUSE TESTS FOR DETECTION OF 'DOPED' HORSES
DRUG ADMINISTERED IN GELATINE CAPSULES

Horse No	Weight Kg	Veterinary Deductions	Deductions from Mouse Tests		Product Administered	Treatment of Horse Dose Given	
			Treated	Size Dose		Total (Mg)	Gamma/Kg
9681	400	Normal	No		Water		
342	435	Normal	No		Water		
343	425	Normal	No		Water		
9960	475	Uneasy	Yes	Large	Morphine	100	210
369	415	Slight stimulation	Yes	Large	Morphine	65	158
381	425	Normal	Yes	Small	Heroin	2	5
373	415	Normal	Yes	Small	Heroin	5	12
141	445	Restless	Yes	Large	Heroin	10	22
376	450	Normal ?	Yes	Large	Codeine	65	145
366	450	Stimulated ?	Yes	Large	Dilaudid	2	4
365	460	Stimulated	Yes	Large	Dilaudid	5	11
9609	470	Restless	Yes	Medium	Dilaudid	10	21
9925	490	Stimulated	Yes	Small	Pantopon	10	20
368	435	Stimulated ?	Yes	Medium	Pantopon	10	23
367	460	Stimulated	Yes	Medium	Opium gran	650	1415
9851	370	Normal ?	Yes	Large	Opium-gran	1000	2720
9988	405	Quiet	Yes	Large	Opium gum	1000	2475

The results obtained in making tests on the saliva of twenty horses which were injected with unknown solutions are given in Table II. It will be observed that the opinions of the veterinarians were not always in agreement with the subsequent information in indicating whether a horse had or had not been "doped." The mouse tests were correct in every instance, in showing whether a horse had or had not been "doped," and also in suggesting whether a large or a small dose had been administered. In the case of heroin and Dilaudid, the smallest doses injected were 2 mg per horse. These doses correspond to the single doses of these drugs administered to humans. It will be noted that the veterinarians were unable to observe any evidence of abnormality in these horses.

Through the courtesy of Jervis Spencer of the Maryland Racing Commission, and of Doctors W B D Penniman and T A Ladson, we obtained samples of saliva collected from a Maryland race horse, using the customary race-track pro-

cedure the horse's mouth was washed with water, the gauze and gloves being added to the washings and the entire collection made up to about 300 cc with distilled water. Samples of saliva were obtained 30 and 45 minutes after administering 10 grains of morphine sulphate in a gelatine capsule. The horse was galloped for about two miles, and saliva samples collected approximately one hour and one and one-half hours after administration. The injection of 1 cc of each sample as collected produced a positive reaction when tested on May 14th, or the day after the saliva had been collected. These saliva samples were stored in a refrigerator and retested with the same positive results after one week, and after two months. Since the horse was known to have received morphine sulphate, the results are not included in Table III. The veterinarian was unable to observe any abnormalities in this horse, nor could the jockey detect any differences in his behavior.

Based upon this test, the experiments recorded in Table III were undertaken. Veterinary observations were not always indices of the treatment accorded the horses. The mouse test was again correct in each instance in answering the question whether a horse had or had not been "doped." Morphine appeared to be somewhat more potent than the corresponding dose of opium. Pantopon was moderately effective.

Our studies are being continued in an attempt to detect characteristic symptoms for each of these products, and some success has already been attained. We do not feel justified at this time in asserting, based *solely* upon these mouse tests, which of these opium derivatives was given to a horse. However, we do feel that a positive mouse test would justify the time, labor and expense of a chemical search. Chemical tests of the saliva may be able to identify these products.

CONCLUSION

1 Mouse tests upon the undiluted salivas collected from 37 horses correctly showed, in every instance, whether the horse had or had not received an opium derivative (opium, morphine, heroin, codeine, Dilaudid or Pantopon).

2 Present information does not permit identification of the specific product administered in all cases. Characteristic symptoms for such identification are being sought.

FOOT-NOTE Through the courtesy of Commissioner of Narcotics H. J. Anslinger, supplies of morphine, heroin, Pantopon and opium were made available for this investigation. Dilaudid was purchased on the open market. The technical assistance of Arnold Quici in the preparation of these solutions and capsules and Dr. J. C. Horner, Dr. W. A. Paxson, Robert Moore, Harry J. Pratt and Aaron B. Sloane in the administration of these drugs, the collection of saliva and the conduct of the mouse tests is gratefully acknowledged.

REFERENCES

- (1) Munch, J. C., 'Saliva Tests I. Morphine' *Jour. A. Ph. A.* 23: 766 (1934).
 - (2) Munch, J. C., 'Saliva Tests II. Heroin' *Ibid.* 23: 1185 (1934).
-

THE ASSAY OF NATIONAL FORMULARY PREPARATIONS
CONTAINING BISMUTH *BY GLENN L. JENKINS AND SYLVIA MILLETT ¹

Glycerite of Bismuth is the only bismuth preparation in the National Formulary for which a tolerance and assay are now official. The present study was undertaken to determine whether the method of assay employed for the glycerite could be applied to the determination of the bismuth content of Solution of Bismuth, Elixir of Bismuth, Elixir of Pepsin and Bismuth and Elixir of Pepsin, Bismuth and Strychnine, and also to determine whether other methods might be applied advantageously to the assay of these preparations.

Various methods have been utilized for the quantitative determination of bismuth, namely the official sulphide method (1) which is known to be accurate, the formaldehyde method (2) which is not suitable since the procedure does not separate other metals commonly present as impurity, the electrolytic method (3) which is not further considered since electrolytic methods in general have been deleted from the eleventh revision of the United States Pharmacopoeia, and methods based on the precipitation of bismuth as the phosphate. Moser (4) reported that the phosphate process is the most advantageous method of estimating bismuth since bismuth phosphate, BiPO_4 , is of definite composition, it forms a white, heavy crystalline precipitate which is insoluble in water and very dilute nitric acid, it deposits and filters quickly, it is not changed by ignition, and it is not readily reduced. This method was further studied by Stahler and Scharfenberg (5), Salkowski (6), Stahler (7) and Schoeller and Waterhouse (8). Schoeller and Waterhouse critically reviewed much of the earlier investigator's findings. Working with pure bismuth nitrate solutions, they concluded that the quantitative precipitation of the phosphate was a matter of rather delicate adjustment, if the acidity was low, the liquid on being heated usually deposited a heavy crystalline precipitate of oxynitrate, and if the acidity was higher than necessary to prevent deposition of oxynitrate, a small fraction of the bismuth failed to precipitate as phosphate unless an excessive quantity of alkaline phosphate was added. Mayer (9) recommended a phosphate method for the assay of bismuth without giving experimental data to indicate the accuracy of the procedure.

In the present investigation, a comparative experimental study of the official sulphide method, of the Mayer phosphate method and of the Schoeller and Waterhouse phosphate method was undertaken. The procedures followed were (1) That of the National Formulary V for Glycerite of Bismuth in the sulphide method (2) The Mayer phosphate method which is as follows

Accurately measure 5 cc. of Glycerite of Bismuth into a 400 cc. beaker, add about 100 cc. of water, heat to boiling, then add concentrated hydrochloric acid until the precipitate which at first forms redissolves and then add ammonia water until a turbidity is produced after which sufficient concentrated hydrochloric acid is added to clear up the turbidity, to this boiling solution

* Abstracted in part from a thesis submitted by Sylvia Millett to the Graduate School of the University of Maryland in partial fulfillment of the requirements for the Degree of Master of Science.

¹ Alumni Scholar, University of Maryland, School of Pharmacy, 1933-1934

add an excess (about 50 cc should be sufficient) of ten per cent ammonium phosphate solution drop by drop from a 50 cc pipette. Allow to settle and filter the precipitate on a Gooch crucible and wash with hot water until free from chlorides and after drying crucible and contents, place in a nickel crucible and heat until the weight is constant.

"Multiply the weight of the precipitate by 0.7663 and then by 20, the result will be the grams of Bi_2O_3 in 100 cc of sample."

(3) The Schoeller and Waterhouse phosphate method modified to adapt it to use with the official bismuth preparations as follows

Accurately measure a portion of the preparation representing about 0.5 Gm of Bi , dilute the solution to about 100 cc with distilled water, and carefully add ammonia water until a slight permanent precipitate is formed. The precipitate formed in cold solution is not the crystalline oxynitrate but a flocculent basic nitrate which dissolves on the addition of nitric acid. Add 2 cc of nitric acid, heat the solution to boiling and precipitate the bismuth while the solution is boiling by adding a 10 per cent solution of diammonium phosphate. The addition of ammonium phosphate should be made very slowly at first (preferably from a burette at the rate of about 30 drops per minute) and with constant stirring to favor the formation of a coarsely grained precipitate. When no more precipitate forms, the remainder of the precipitant may be added rapidly. A considerable excess of the ammonium phosphate solution should be used, about 60 cc of 10 per cent solution for each 0.5 Gm of bismuth was found to be best. After adding the precipitant, dilute the solution to 400 cc, digest the solution on a water bath for 20 to 30 minutes, and decant the supernatant liquid through a Gooch crucible. Wash the precipitate twice with a hot 3 per cent solution of ammonium nitrate containing 0.5 cc of nitric acid per liter, wash the precipitate into the crucible, dry and ignite gently. Each Gm of BiPO_4 is equivalent to 0.6865 Gm of Bi .

This procedure entirely obviates the formation of crystalline oxynitrate caused by deficiency of nitric acid, while the subsequent dilution of the liquid reduces the concentration of the nitric acid so that all of the bismuth is precipitated as phosphate.

ASSAY OF GLYCERITE OF BISMUTH

Two samples of Glycerite of Bismuth prepared by the method of the National Formulary V were assayed by the three methods. Five-cc samples of the glycerite were accurately measured from a pipette calibrated to contain 5 cc and the glycerite adhering to the wall of the pipette was washed out with distilled water. The results given in the following table are expressed in terms of per cent Bi W/V.

TABLE I—ASSAY OF GLYCERITE OF BISMUTH

Method	Analyst A		Analyst B	
	Sample 1	Sample 2	Sample 1	Sample 2
Sulphide	14.33, 14.77	12.35, 12.48	14.36, 14.40	12.45, 12.52
Mayer phosphate	14.29, 14.32	12.43, 14.47	14.38, 14.35	12.50, 12.46
Schoeller Waterhouse phosphate	14.69, 14.68	12.90, 12.60	14.60, 14.42	12.78, 12.82

The results show that the sulphide and the Mayer phosphate methods yield equally accurate and comparable results and that the Schoeller Waterhouse phosphate method yields slightly high results. Consequently, the Schoeller Waterhouse phosphate method was eliminated and further study was limited to the sulphide and Mayer phosphate methods. Samples of solution of bismuth, elixir of bismuth, elixir of pepsin and bismuth and of elixir of pepsin, bismuth and strychnine were prepared from the respective glycerites and assayed with results as follows

TABLE II

Preparation and Method	Analyst A		Analyst B	
	Sample 1	Sample 2	Sample 1	Sample 2
<i>Solution of Bismuth</i>				
Sulphide	1 83, 1 79	1 61, 1 59	1 78, 1 80	1 57, 1 64
Mayer phosphate	1 81, 1 75	1 60, 1 63	1 83, 1 86	1 54, 1 58
Calculated	1 80	1 60	1 80	1 60
<i>Elixir of Bismuth</i>				
Sulphide	1 78, 1 79	1 58, 1 59	1 79, 1 80	1 62, 1 60
Mayer phosphate*	1 81, 1 80	1 61, 1 60	1 82, 1 82	1 61, 1 60
Calculated	1 80	1 60	1 80	1 60
<i>Elixir of Pepsin and Bismuth</i>				
Sulphide	1 81, 1 80	1 59, 1 59	1 79, 1 79	1 61, 1 60
Mayer phosphate	1 78, 1 79	1 58, 1 57	1 78, 1 80	1 58, 1 59
Calculated	1 80	1 60	1 80	1 60
<i>Elixir of Pepsin, Bismuth and Strychnine</i>				
Sulphide	1 83, 1 79	1 61, 1 62	1 82, 1 80	1 63, 1 59
Mayer phosphate	1 81, 1 78	1 60, 1 58	1 78, 1 79	1 57, 1 58
Calculated	1 80	1 60	1 80	1 60

SUMMARY AND CONCLUSIONS

1 A comparative study has been made of the accuracy of the sulphide, Mayer phosphate and Schoeller Waterhouse phosphate methods of estimating bismuth in bismuth containing liquid preparations of the National Formulary

2 The Schoeller Waterhouse phosphate method does not yield accurate results when applied to these preparations

3 Either the sulphide method or the Mayer phosphate method yields accurate and comparable results when applied to the glycerite, solution or elixirs of bismuth

4 Since the Mayer phosphate method is simple and accurate, it might advantageously replace the sulphide method now official for the assay of glycerite of bismuth and be made official for the assay of the solution and elixirs containing bismuth

REFERENCES

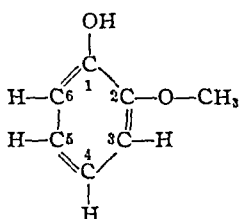
- (1) National Formulary, 5th Edition, 108 (1926)
- (2) *The Analyst*, 44, 325 (1919)
- (3) Kammerer, A L, 'The Electrolytic Estimation of Bismuth and Its Separation from Other Metals' (1902)
- (4) *Z anal Chem*, 45, 19 (1906)
- (5) *Berichte*, 38, 3862 (1905)
- (6) *Ibid*, 38, 3943 (1905)
- (7) *Chem Zeitsch*, 31, 615 (1907)
- (8) *The Analyst*, 45, 435 (1919)
- (9) *Jour A Ph A*, 22, 653 (1933)

POTASSIUM GUAIACOL SULPHONATE *

BY A. H. CLARK AND ERNST KIRCH

For several years potassium guaiacol sulphonate has been used as a medicament in the treatment of those conditions in which guaiacol is indicated. Since it is a very stable compound, as all aromatic sulphonates are, its use may be looked upon as irrational but it is popularly believed to be absorbed as an entire molecule and in this way acts as does guaiacol. Be this as it may it is very widely used, especially as a syrup, and its manufacture and sale is a commercial enterprise of considerable importance.

There are several guaiacol sulphonic acids and their salts possible from a theoretical standpoint and some of these have been described. Guaiacol, the basic substance, has the following structure



If the carbon atoms of the ring are numbered as above it is seen that four guaiacol sulphonic acids are possible, namely the 1,2,3, the 1,2,4, the 1,2,5 and the 1,2,6. From each one of these acids, as well as by replacement of the hydrogen in the OH group, or in both ways at once, salts may be formed. Several guaiacol sulphonates are thus possible. The only ones of importance in which we are interested at the present time are those in which the metal enters the sulphonic acid group since the presence of the potassium in the OH group is incidental only.

Much confusion in the nomenclature of these salts is occasioned by different writers using such terms as ortho, meta, para, viscinal, alpha, etc., to indicate the position of the three substituents in the benzene ring. It is not always clear whether the OH or the OCH₃ group is the basic one used and it is evident that two viscinal compounds are possible. To avoid all confusion in the following discussion the system of numbering as given above will be used throughout and even the terms used by others will be translated into this system when it is possible to do so.

The questions that prompted this investigation are: Is there any difference in therapeutic activity between the four possible salts? If so, which one is the most active? If any one is more active than the others how may it be distinguished from the others? What is the product commonly sold? When it is considered that many pharmaceutical houses market potassium guaiacol sulphonate without any statement as to what it is, the importance of a correct answer to these questions is obvious.

Search of the available literature reveals no records of painstaking pharmacological work on this substance. From its very nature it might be assumed to liberate guaiacol with difficulty and therefore have no value unless it is absorbed as

* University of Illinois, College of Pharmacy Chicago, Ill.

an entire molecule Frankel (1) states that the 1,2,4 compound has no value while the 1,2,6 has May (2) states that the 1,2,3 compound is therapeutically useful and that the 1,2,4 has no value Barrowcliff and Carr (3) state that it is important the salt should be free from the 1,2,4 compound Fourneau (4) states that Thiocol is the 1,2,6 compound Rosenthaler (5) states that Thiocol is 1,2,6 and that the 1,2,4 is not to be employed Evers (6) states that potassium guaiacol sulphonate is the salt of the 1,2,5 acid

In this connection some value may be attached to the fact that the following authorities recognize the 1,2,6 compound, specifically mentioning it in their descriptions which would indicate preference over the others New and Nonofficial Remedies of the A M A, all editions from 1918 to 1934, inclusive, Svenska Farmakopen, 1925, Pharmacopœa Hungarica, IV, 1934, British Pharmaceutical Codex, 1934, Deutsches Arzneibuch, Prior to 1926, Merck's Index, IV, 1930

Other authorities described it as follows Pharmacopœa Helvetica, V, 1933, as a mixture of 1,2,4 and 1,2,5, Deutsches Arzneibuch 1926 as a mixture of 1,2,4 and 1,2,5, Pharmacopœa Jugoslavica 1933 as 1,2,5

The first to give attention to guaiacol sulphonic acid or potassium guaiacol sulphonate seems to have been Tiemann and Koppe (7) but Barell (8) was the first to make any study of its structure He thought that he had made the 1,2,6 acid This conclusion seems to be incorrect in the light of later and very thorough work which is ably presented by Paul (9) The latter showed that by sulphonating guaiacol below 100° C a mixture of the 1,2,4 and 1,2,5 acids is formed Rising (10) studied the subject about the same time and published the results of his work a little later He concludes that the 1,2,4 and the 1,2,5 acids are readily prepared at temperatures below 100° C, most readily at 70° C If the temperature is 135–140° C he claimed to have prepared a so-called viscinal acid, either the 1,2,3 or the 1,2,6 These various acids were studied, their potassium salts described and other facts recorded He concluded that the marketed products at that time were mixtures of the 1,2,4, the 1,2,5 and some of the basic salt, that is potassium replacing the hydrogen in the OH group

Paul (11) published a second paper in which he disagreed with some of Rising's conclusions, holding that the latter's viscinal compound, the 1,2,3 or 1,2,6 was in reality $C_6H_3(OH)(OH)HSO_3$ 1,2,4 and offers evidence to support this stand It is significant that Rising did not publish any comment on this criticism At this point the matter rested for about twenty years until Rupp and Brixen (12) published the results of much work done on these products and also pharmaceutical preparations made from them

From these sources the answers to the last two questions asked in the beginning of this discussion are obtained With the exception of Barell's work the conclusion is that the products marketed up to 1926 were mixtures of the 1,2,4 and the 1,2,5 compounds with small varying amounts of the basic one No investigator has shown that any marketed product consisted, even in a small degree of the 1,2,6 compound and it seems certain that it never has been made We have examined samples of potassium guaiacol sulphonate from seven different sources in addition to Thiocol and every one of them is substantially the same in every way and when examined by the methods used by the authors referred to above are found to be a mixture of the 1,2,4 and 1,2,5 salts

The tests, data, etc., upon which this conclusion is based are summarized in the following statements

Physically all samples were about the same. Colorless crystalline powders, odorless, of a faintly bitter taste, and a neutral or slightly alkaline reaction to litmus. Marked alkalinity indicates basic character, i.e., some of the H in the OH group replaced.

The melting points of the free acids obtained from samples prepared directly from guaiacol were 96–97° C for the 1,2,4 and 106.5–107.5° C for the 1,2,5. The same acids prepared from Thiocol gave 96.5–97.3° C and 106.5–107.5° C and from one commercial sample, acids isolated gave 96.5–97.5° C and 106–107.5° C. The figures given by Rising (10) are 97–98° C and 106–108° C. Since all other samples were alike in other respects no further melting point determinations were made.

Every sample gave dinitroguaiacol the melting point of which varied between 121.5° and 122° C, indicating according to Rupp and Briven (12) the presence of the 1,2,4 compound. The figure given by Mulliken (13) for this compound is 122° C. The following four reactions are the same as used by Rupp and Briven.

Ferric chloride gave a blue coloration with every one of our samples.

Lead acetate precipitates the 1,2,4 acid but not the 1,2,5 and all samples behaved alike with this reagent.

Lead subacetate precipitates both the 1,2,4 and the 1,2,5 acids and with those samples on which this test was tried precipitates were obtained.

Ammonia water and calcium chloride precipitate with the 1,2,4 acid but not with the 1,2,5. This was the case with those samples on which the test was used.

Upon coupling with diazobenzene as directed by Rising both the 1,2,4 and the 1,2,5 compounds give an orange-red coloration but no precipitate. This coloration was given by all our samples.

The solubility in water is of some interest since the 1,2,5 salt is much more soluble than the 1,2,4. All our samples were freely soluble and all about alike. From a careful observation all samples examined contained about 75% of the 1,2,4 and 25% 1,2,5.

Rising claimed that his viscinal compound, the 1,2,6 or 1,2,3 as he stated it to be, gave a green color with ferric chloride, a purple color with lead acetate, a precipitate only after standing with lead subacetate and brown flakes with diazobenzene. Since no sample examined by us gave any of these reactions, not one of them contained what Rising thought to be the 1,2,6 compound.

CONCLUSIONS

This study has brought out the following facts about potassium guaiacol sulfonate

- 1 That the evidence supporting the belief that the 1,2,6 compound is the most valuable from a therapeutic standpoint or that the 1,2,4 is valueless or harmful, is very slight and practically worthless

- 2 That the 1,2,6 compound never has been made

- 3 That all market products are alike, eight of them having been examined by us

- 4 That since the 1,2,6 compound does not exist and the market products are all alike no tests can at present be suggested to distinguish one product from another

unless some manufacturer begins to separate the 1,2,4 from the 1,2,5 and markets a single salt in place of the mixture or some one actually makes the 1,2,6 compound

5 That the proportion of the 1,2,4 to the 1,2,5 is approximately 3 to 1

BIBLIOGRAPHY

- (1) Frankel, Sigmund, "Die Arzneimittel Synthese," 585 (1927)
- (2) May, Percy, "The Chemistry of Synthetic Drugs" 168 (1921)
- (3) Barrowcliff, M and Carr Francis H, "Organic Medicinal Chemicals," 164 (1920)
- (4) Fournau Ernest, "Organic Medicaments and Their Preparation" 9 (1925)
- (5) Rosenthaler, L, "Neue Arzneimittel Organischer Natur," 95 (1906)
- (6) Evers Norman, "The Chemistry of Drugs" 41 (1926)
- (7) Tiemann and Koppe, *Berichte*, 14 2019 (1881)
- (8) Barell, E *Pharm Ztg*, No 13 (1899) (Patent)
- (9) Paul L, *Berichte* 39 2773 (1906)
- (10) Rising A *Ibid* 39, 3685 (1906)
- (11) Paul, L *Ibid* 39, 4093 (1906)
- (12) Rupp, E and Brixen A *Archiv Der Pharm und Berichte*, 36, 264, 322, 698 (1926)
- (13) Mulliken, S P, "Identification of Pure Organic Compounds," 2, 253 (1906)

A COMPARATIVE STUDY OF ENTERIC COATINGS¹

BY F S BUKEY AND PHYLLIS RHODES^{2 3}

The authors in a previous study of enteric coatings found a wide variation in the efficiency of the coating materials. It was, therefore, decided to test various types of commercial coatings. Several of the pharmaceutical manufacturers agreed to cooperate in this study by applying their enteric coatings on tablets of barium sulphate.

Five different enteric coatings were submitted by the manufacturers for this study. Among these types were two of keratin, one salol-shellac, one shellac and one composed of a mixture of salol and resins. In every case the products submitted were finished and in external appearance resembled any sugar-coated tablet. The uncoated tablets measured 10.5 mm in diameter and 4.8 mm in thickness. In addition to the tablets, one manufacturer supplied enteric and sugar-coated No. 1 capsules filled with barium sulphate.

The subjects for these experiments were picked from the student body and in every case normal individuals in apparent good health. The X-ray was used to determine the exact point of disintegration. In general, the following procedure was used in making this study. Each subject was given a certain number of tablets followed at once with a glass of water containing a teaspoonful of Bari-o-meal. The Bari-o-meal was sufficient to outline the stomach, but did not produce a density great enough to mask the tablets. The first radiograph was usually taken after 30 minutes and others followed at desired intervals until disintegration occurred.

¹ Section on Practical Pharmacy and Dispensing A. Ph. A. Washington meeting 1934

² Fellow of the Smith Dorsey Co. Lincoln, Nebr.

³ College of Pharmacy University of Nebraska Lincoln, Nebraska

The results of this study have been tabulated into groups according to the type of coating. The chart gives the number of tablets taken, the time at which they were taken and the point and time of disintegration.

Kind of Coating	Subject	Number of Tablets Taken	Time of Taking	Point and Time of Disintegration
Keratin No 1	No 1	3	4 30 P M	3, stomach, 45 min
	No 2	3	4 30 P M	3, stomach, 45 min
	No 3	3	7 40 P M	3, stomach, 60 min
	No 4	3	7 40 P M	3, stomach, 80 min
	No 5	3	7 40 P M	3, stomach, 80 min
	No 6	3	8 10 P M	1, stomach, 45 min 2, stomach, 60 min
	No 7	3	8 10 P M	1, stomach, 45 min 2, stomach, 60 min
	No 8	3	8 10 P M	2, stomach, 60 min 1, stomach, 80 min
	No 9	3	8 10 P M	3, stomach, 80 min
Keratin No 2	No 1	4	10 00 A M	1, ascending colon, 6 hrs 30 min 2, descending colon, 10 hrs 20 min 1, pelvic colon, 10 hrs 20 min
	No 2	4	9 00 A M	2, ascending colon, 11 hrs NOTE Two were in the stomach at the end of 13 hrs point of disintegration not determined
	No 3	4	9 30 A M	1, small intestine, 10 hrs 30 min 3, small intestine, 12 hrs 30 min
	No 4	4	9 00 A M	3, ascending colon, 12 hrs 1, transverse colon, 24 hrs
	No 5	4	1 40 P M	1, stomach, 9 hrs 10 min 1, pelvic colon, 17 hrs NOTE The point of disintegration of 2 tablets was unknown
	No 6	4	1 40 P M	2, descending colon, 17 hrs NOTE The point of disintegration of 2 tablets was unknown
	No 7	4	7 00 A M	3 were excreted in 29 hrs NOTE The point of disintegration of 1 tablet was unknown
Shellac (3 coats)	No 1	3	1 30 P M	3, stomach, 3 hrs
	No 2	3	1 30 P M	3, stomach, 3 hrs
	No 3	3	6 30 P M	3, stomach, 1 hr
	No 4	3	1 45 P M	3, stomach 1 hr 20 min
	No 5	3	1 45 P M	1, stomach, 1 hr 25 min 2, stomach, 2 hrs
	No 6	3	1,45 P M	1, stomach, 1 hr 30 min 2, stomach, 2 hrs 5 min
	No 7	3	2 00 P M	3, stomach 1 hr 40 min
	No 8	3	2 00 P M	3, stomach, 1 hr 20 min
Salol and gum resin mixture	No 1	3	11 00 A M	1, small intestine, 5 hrs 10 min 1, stomach 7 hrs 1, small intestine, 7 hrs
	No 2	3	12 30 P M	1, stomach, 3 hrs 30 min 1, stomach 5 hrs 30 min 1, small intestine 6 hrs 30 min

No 3	3	12 30 P M	1, stomach 3 hrs 30 min 1, stomach, 4 hrs 30 min 1, stomach, 6 hrs 30 min
No 4	3	3 00 P M	1, stomach, 4 hrs 1, small intestine, 4 hrs

NOTE The point of disintegration of one was not determined It was still in the stomach at the end of 7 hrs

No 5	3	3 00 P M	1 small intestine, 4 hrs 1 small intestine, 5 hrs
------	---	----------	--

NOTE The point of disintegration of one was not determined It was still in the stomach at the end of 7 hrs

No 6	3	11 00 A M	1, small intestine, 4 hrs 30 min 2, small intestine, 5 hrs 30 min
------	---	-----------	--

No 7	3	11 00 A M	1, stomach, 5 hrs 30 min
------	---	-----------	--------------------------

NOTE The point of disintegration of two was not determined They were still in the stomach at the end of 6 hrs 30 min

No 8	3	12 30 P M	2, stomach, 4 hrs 1 stomach, 5 hrs
------	---	-----------	---------------------------------------

No 9	3	4 00 P M	1 small intestine, 4 hrs 2 small intestine, 5 hrs
------	---	----------	--

No 10	1	4 00 P M	1, small intestine, 4 hrs
-------	---	----------	---------------------------

No 11	3	4 00 P M	1, small intestine 4 hrs 2 small intestine 5 hrs
-------	---	----------	---

No 12	3	4 00 P M	1, small intestine, 5 hrs 2, small intestine, 6 hrs
-------	---	----------	--

No 13	3	5 15 P M	1, stomach 5 hrs 1, stomach, 6 hrs
-------	---	----------	---------------------------------------

NOTE The point of disintegration of one was unknown It was still in the small intestine at the end of 7 hrs

No 14	3	5 15 P M	1, stomach, 3 hrs 2 small intestine 6 hrs
-------	---	----------	--

Salol-shellac	No 1	2 T 2 C	11 00 A M	1 capsule, stomach, 2 hrs 30 min 1 capsule small intestine, 5 hrs 30 min 2 tablets, small intestine, 6 hrs 30 min
---------------	------	------------	-----------	---

No 2	2 T 2 C	11 00 A M	1 capsule, small intestine, 2 hrs 30 min
------	------------	-----------	--

NOTE The point of disintegration of one capsule was unknown

No 3	2 C	11 00 A M	2 tablets, stomach, 5 hrs 45 min
------	-----	-----------	----------------------------------

No 4	2 C 2 T	12 45 P M	1 capsule, stomach, 6 hrs 1 capsule, stomach, 8 hrs 2 tablets, stomach, 8 hrs
------	------------	-----------	---

No 5	2 C 2 T	10 00 A M	2 capsules stomach, 5 hrs 15 min 2 tablets small intestine 8 hrs 30 min
------	------------	-----------	--

NOTE The point of disintegration of 2 capsules was not known

No 6	2 C 2 T	11 00 A M	1 tablet, small intestine 6 hrs 1 tablet, small intestine, 7 hrs 2 capsules small intestine 3 hrs 1 tablet small intestine, 4 hrs 45 min 1 tablet, small intestine 6 hrs
------	------------	-----------	--

It is evident from the data obtained that there is about as much variation in the commercial coatings, as in those prepared in the laboratory. On considering the keratin coating No 1, we find total disintegration in the stomach, the average time being about one hour. These tablets are of no value for enteric medication. From experience we have had with keratin as an enteric coating we concluded that the adverse results were caused by a faulty method of application. The results of the experiments for keratin No 2, showed that 13 tablets disintegrated in the colon, 4 in the small intestine, and 1 in the stomach. The point of disintegration of 7 was unknown, and 3 were excreted. This coating proved to be 80.95% efficient. In making this calculation for the various coatings, results were disregarded in all cases where the exact point of disintegration was unknown. The results from the keratin No 2 coating indicate an exceptionally good enteric coating. The experiments for the shellac coating show that these tablets are of no value for enteric medication. The average time for disintegration was between 70 and 100 minutes. Faulty application cannot be claimed for this coating as other tablets purchased on the market disintegrated in about the same average time. In the case of the salol resin mixture, 13 tablets disintegrated in the stomach and 22 tablets in the intestine. Five tablets had not disintegrated when the last picture was taken, and their fate was not determined. This enteric coating was 63.00% efficient. The results of the experiments using salol shellac showed that 8 tablets disintegrated in the small intestine and 4 in the stomach. Four capsules disintegrated in the small intestine and 5 in the stomach. The fate of 3 capsules was not determined. The average time of disintegration for the tablets was 6 hours and of the capsules was 4 hours. The percentage efficiency of the tablets was 66.66% and of the capsules was 44.44%. In this case, it appears that the tablets are a better means of medication than the capsules.

It may be concluded that none of the enteric coatings studied was perfect. The best results would seem to be obtained with keratin when properly applied. However, if one considered the absorption rate of the colon less than that of the small intestine, the salol mixtures would be better. Capsules with the same type of enteric coating as a tablet are not as efficient, due no doubt to mechanical difficulties as the capsules roll thin on the ends during the coating process. Shellac by itself is of no value as an enteric coating.

The authors wish to thank the Abbott Laboratories Inc. North Chicago Ill. G. D. Searle Co., Chicago, Ill., Sharp and Dohme Co., Baltimore, Md. and the Smith Dorsey Co., Lincoln Nebr., for their cooperation in coating tablets for this study. The authors also wish to thank the students of the College of Pharmacy, University of Nebraska, for their assistance as subjects in this study.

ENTERIC COATINGS. I. A LABORATORY METHOD FOR THE STUDY AND CONTROL OF ENTERIC COATINGS *

BY MILTON WRUBLE

Several years ago a preliminary report on enteric coatings was made by the writer (1). Since that time the opportunity has presented itself to study the prob-

* The Research Laboratories, The Upjohn Company Kalamazoo Michigan (June 26 1935)

lem more intensively and in a more comprehensive manner because of the availability of apparatus and working facilities

p_H of Gastric and Intestinal Juices—The normal acidity of the gastric juice due to the free hydrochloric acid present ranges from about *p_H* 1.6 to *p_H* 1.8. However, it usually varies over a much wider range

Vanzant, Alvarez, Eusterman, Dunn and Berkson (2) have studied the gastric acidity of 3746 persons in whom careful examination did not reveal any disease which could perceptibly affect the mucous membrane or the secretory activity of the stomach

They found a steady increase in the incidence of achlorhydria from youth to old age and that free gastric acidity appears to increase rapidly from childhood to the age of 20 years when adult values are reached. They also found that about the age of puberty, the average value for boys begins to rise considerably above that for girls

Boldyreff (3), who has made extensive investigations in this field, has proved that in the normal organism during digestion as well as in the empty stomach the acidity of the gastric contents is mainly regulated by the alkali of the pancreatic juice regurgitated from the duodenum into the stomach

He has further shown (4) that the entrance of duodenal secretions into the stomach occurs as a purely physiological phenomenon (a) when the stomach and duodenum are empty (b) with abundance of acid in these organs, (c) with abundance of fat in these organs and with any strong irritation of the duodenal mucosa caused by hot or cold liquids, alcohol, etc.

Much evidence has been presented within recent years to show that in the human small intestine the reactions may vary from distinctly acid to slightly alkaline. Long and Fenger (5) have made an important contribution in this direction

Howell makes the following statement (6): "The secretions emptying into the small intestine—the succus entericus, the bile and the pancreatic juice, all have a slightly alkaline reaction and we should expect, therefore, to find the reaction of the intestinal contents on the alkaline side." Most observers have reported, however, that during digestion the reaction of the contents is acid."

Recent work with dogs by Bollman and Mann at the Mayo Clinic (7) has shown that during digestion the reaction in the duodenum may vary between *p_H* 3.8 and *p_H* 6.6. In the jejunum they found the reaction to be on the acid side. In the ileum they observed that even during digestion the reaction did not drop below the neutral point *p_H* 7.0.

Temperature—Hepburn, Eberhard, Ricketts and Rieger (8) measured temperatures in the gastrointestinal tract with a recording thermometer. In a group of 257 healthy, active individuals the gastric temperature was between 97.5 and 102.2° F. In a group of 53 subjects the temperature of the upper part of the intestine lay between 98° and 100.1° F.

The ingestion of either ice water or ice cream produced marked decrease in gastric temperature, followed by a rise, at first quite rapid, then progressively slower. The average recovery time exceeded one-half hour. The use of ice water in a test-meal was found to delay the gastric emptying time by from 15 to 30 minutes.

The authors obtained evidence that leakage of a cold beverage through the pylorus lowers the temperature of the upper part of the intestine by several degrees. This observation may throw light on the etiology of the gastroenteric disturbances in patients who have a rapid emptying time and partake copiously of cold beverages.

The ingestion of hot coffee produced a marked increase in gastric temperatures followed by a decrease, at first rapid then progressively slower.

Motility or Emptying Rate of Stomach—The peristaltic activity of the healthy stomach begins shortly after the ingestion of the meal, but its advent may be retarded or even inhibited by nervous states and emotions

The motility of the stomach depends on several factors. The average emptying rate in patients without obstructive lesions lies between three and five hours. Briggs (9) made such a study with 100 normal individuals employing the barium meal. He obtained the following figures: The stomach emptied in two and a half hours in 1 per cent, in three hours in 6 per cent, in three and a half hours in 9 per cent, in four hours in 44 per cent, in four and a half hours in 32 per cent and in five hours in 8 per cent.

Campbell and Conybeare (10) independently examined a group of healthy male students by means of the fractional test meals and also radiographically. They demonstrated that hypertonus, hyperacidity and rapid emptying of a barium meal occurred most frequently in men of the broad-chested, vigorous, athletic type, hypotonus, low acidity and slow emptying for the most part in narrow chested men below the average of physical development and not taking regular exercise.

Bukey and Brew (11) in their study of the emptying time of the stomach with reference to pills and tablets, arrived at the following conclusions:

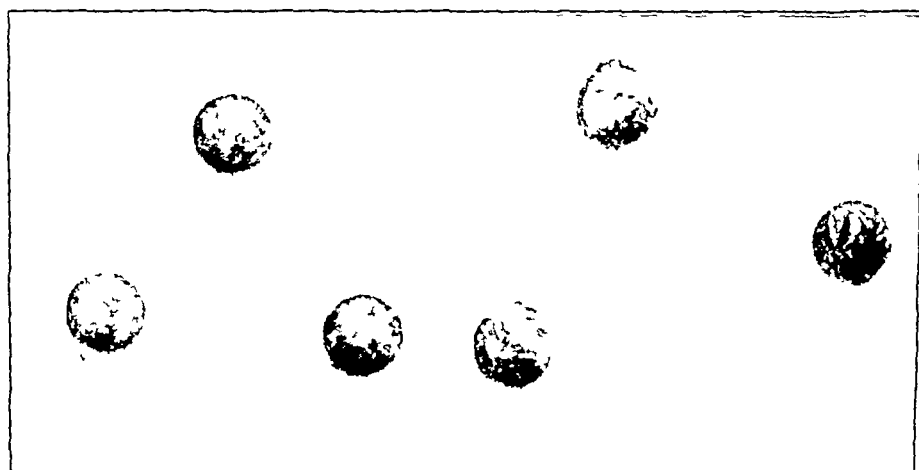


Fig 1

Fig 2

- (1) The size and shape of a pill, tablet or capsule have no effect on the length of time it will remain in the stomach
- (2) The same individual does not react uniformly toward this type of medication with reference to emptying time
- (3) Emptying time may be influenced by diet
- (4) The type of coating does not have any effect on the length of time that pills, tablets and capsules will remain in the stomach

Motility may be impaired or exaggerated by disease. Abnormal rapid emptying or hypermotility occurs in a certain proportion of cases of duodenal ulcer with hypertonus.

EXPERIMENTAL

The actual *in vitro* study of enteric coatings may be conveniently carried out in an apparatus in which the tablets are allowed to rotate in buffers covering the gastric and intestinal ranges at temperatures between 37.5° to 40° C. The apparatus employed (12) was a modification of a type used in earlier investigations in this field. The disintegration point was observed in each case.

While it is true that such a mechanical test can be but a mere approach to the actual picture of conditions in the stomachs and intestines of individuals of widely varying characteristics, still it has been possible to establish a relationship in this manner and thus such a procedure has been of real value in the laboratory study and control of enteric coatings

Hundreds of tablets and capsules have been studied as described, in this laboratory. From the numerous observations made it is significant to note that in every case the coating surface of the tablets immersed in buffers from p_H 1.2 to p_H 6.4 showed little change even after rotating for eight hours or more while those immersed in buffers beginning with p_H 6.4 and upward showed evidence of attack and a definite shriveling effect within 5 to 15 minutes. See Figs 1 and 2

Examination of the latter tablets indicates that the enteric coating has permitted the passage of fluids through it by becoming permeable while in the other case the coating has remained entirely impervious even after many hours of rotation and contact

DISCUSSION

Recent investigations have definitely indicated that our earlier notions regarding the acidity and alkalinity of the stomach and small intestines, respectively, are erroneous. More often the small intestine is slightly acid in reaction and the p_H of the stomach will doubtless vary over a considerable range because of regurgitation and the other factors already enumerated

In addition, therefore, to the requisite physical and chemical properties that a coating must possess and the fact that it must be physiologically inert, it must also resist the wide and variable acid range in the stomach and commence to disintegrate at the slightly acid reaction found in the small intestine. If a coating requires a decidedly alkaline reaction before disintegration commences, the tablet or capsule will in all probability pass through the small intestine without disintegration taking place

CONCLUSIONS

1. A laboratory method for the study and control of enteric coating has been described
2. The extreme sensitivity of this coating in buffers is noted

REFERENCES

- (1) Wruble, M. "Enteric Coatings," *Am J Pharm* 102, 318 (1930)
- (2) Vanzant, F. R., Alvarez, W. C., Eusterman, G. B., Dunn, H. L., Berkson, J., "The Normal Range of Gastric Acidity from Youth to Old Age," *Arch Int Med*, 49, 345 (1932)
- (3) Boldyreff, W. N., "The Self-Regulation of the Acidity of the Gastric Contents," *Bull Battle Creek Sanit and Hosp Clinic*, 22, 65 (1927), *Ibid* 24, 379 (1929)
- (4) *Ibid* 24, 392 (1929)
- (5) Long, J. H., and Fenger, F., "On the Normal Reaction of the Intestinal Tract," *J Am Chem Soc*, 39, 1278 (1917)

' In the human small intestine the reaction may vary from distinctly acid to slightly alkaline on the part which may be reached by the Rehfuß tube where the tube is far enough down to secure a uniform mixture of contents. The acid reaction is apparently as common as the alkaline, but the degree of acidity is not sufficient to check the tryptic digestion, which in some instances seems to be favored by a reaction on the acid side of neutrality. The reaction found must vary with the state of diges-

tive acidity and is simply an equilibrium condition between the chyme and the alkaline juices poured into the duodenum Any reaction near neutrality may obtain "

(6) "Textbook of Physiology," 11th Edition, page 829

(7) *Mayo Clinic Proceedings* May 12, 1930, from Howell, 11th Edition page 829

(8) Hepburn J S, Eberhard, H M Ricketts, R, Rieger C L W, "Temperature of the Gastrointestinal Tract " *Arch Int Med*, 52 603 (1933)

(9) Ryle, J A "Gastric Function in Health and Disease," 23 (1926)

(10) *Ibid* page 19

(11) Bukey, F S, Brew, M, "A Study of the Emptying Time of the Stomach with Reference to Pills and Tablets " *Jour A Ph A* 23, 1217 (1934)

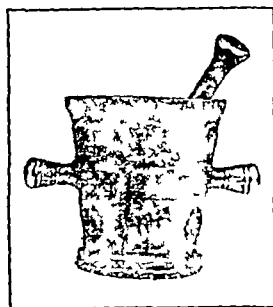
(12) Wruble, M, "Enteric Coatings " *Am J Pharm* 102 318 (1930)

(To be continued)

AN UNUSUAL MORTAR AND PESTLE *

BY JOHN E KRAMER ¹

In one of the museum cases of the Philadelphia College of Pharmacy and Science there is an unusual mortar and pestle attracting the attention of even the most casual passer-by The mortar is made of bronze, 6½ inches high, 5 inches in diameter at the bottom and 6 inches across the top Two handles, one projecting from either side, about half way up from the bottom, are the first things to catch the eye Further inspection reveals a band across the mortar bearing the inscription "NAPOLEON-EMPEREUR " Immediately the investigating spirit is aroused, and close scrutiny reveals a smaller band running around the top with the words "A Besancon Biellemand-Pharmacien-Drogiste" cast in the band Between these bands can be seen wreaths and eagles, alternating, and in the space between the lower band and the bottom of the piece, emblems of two figures facing each other and more wreaths alternate



A Monarch's Mortar

The pestle is also of bronze and is 9½ inches long Through the center it is 1½ inches in diameter but at the ends the diameter reaches 3¾ inches There appear two imperial shields and eagles and the inscription "Anno 1802 " These pieces were presented to the College by Dr David Costelo of New York

It was just one year after the date on this pestle that the Pharmaceutical Society was founded in Paris And it was in 1804 that Napoleon, at the beginning of his greatest bid for fame, secured a popular vote changing France to an empire, and secured for himself the title of Emperor of France Evidently, with the acquisition of this new title, Napoleon had all his belongings stamped accordingly, hence the band around the middle of the mortar

The royal courts of those days had, by appointment, doctors, druggists and others to satisfy the various needs of the emperors and their retinues Biellemand was the favored pharmacist at this time and used this mortar in which to mix the potions and pill masses for the great Corsican and his court The position was no

* Section on Historical Pharmacy A Ph A, Toronto meeting 1932

¹ Philadelphia College of Pharmacy and Science

sinecure, for, where the master went a-warring, his appointed servitors followed in his wake, the physician and the pharmacist no doubt being among the most valuable in the party

The years 1802 to 1805 were peaceful years for Napoleon. The Treaty of Amiens, in 1802, had put France at peace with the world for the first time in ten years. But Napoleon's interference with the affairs of other countries brought an early end to this tranquility in international relationships and to the comparative ease of Bieillemand's appointment.

War broke out again in 1805, resulting in the defeat of the Austrians and the Russians by Napoleon at Austerlitz on December 2nd. On October 14, 1806, he defeated the Prussians at Jena and on June 14, 1807, he defeated the Russians at Friedland.

This was an eventful period in the life of France and Napoleon, and, co-incidentally, in the life of Bieillemand. Many were the campaigns of the Emperor and long and hard were the voyages. Sometime in the midst of these campaigns, about 1808, records show that Napoleon appointed Charles Louis Cadet de Gassicourt his personal pharmacist, and we have, then, but six years in which to give this mortar and pestle credit for active life in His Majesty's service. Just how many places they went, and how many medicines they helped mix can be told only by the pieces themselves. Silently they stand now, ever to be a source of wonder and much conjecture.

THE SIR HENRY S. WELLCOME MEDAL AND PRIZE

COMPETITION FOR 1935

The competition is open to all medical department officers: former such officers, Acting Assistant and Contract Surgeons of the Army, Navy, Public Health Service, Organized Militia, U. S. Veterans' Administration, U. S. Volunteers and the Reserves of the United States, commissioned medical officers of foreign military services and all members of the Association, except that no person shall be awarded a prize more than once in the prize competitions of the Association. All competitors who are not already members of the Association are eligible to membership, and the Executive Council of the Association hopes that they will exercise their privilege and join.

The Executive Council has decided that the Wellcome Prize for 1935 be awarded for the research work most valuable for the military service performed in any branch of medicine, surgery or sanitation, report of which is submitted in competition for the prize and has not previously been submitted for publication.

A Gold Medal (including cash prize of \$500.00) will be awarded for the report of research work submitted in accordance with the above conditions which is decided by the Board of Award to be the most meritorious.

Each competitor must furnish five copies of his competitive report. The reports must not be signed with the true name of the writer, but are to be identified by a *nom de plume* or distinctive device. The reports must be forwarded to the Secretary of the Association of Military Surgeons of the United States, Army Medical Museum, Washington, D. C., so as to arrive at a date not later than August 15, 1935, and be accompanied by a sealed envelope marked on the outside with the fictitious name or device assumed by the writer and enclosing his true name, title and address. The length of the report should not exceed a maximum of 10,000 words, it being understood that tabular statements are not counted. The winning report becomes the property of the Association and will be published in the *Military Surgeon*. Should the Executive Council see fit to designate any paper for "first honorable mention" the writer will be awarded life membership in the Association of Military Surgeons and his report will also become the property of the Association.—*The Military Surgeon*

THE MICROSCOPY OF POWDERED DESICCATED ENDOCRINE GLANDS *

(ABSTRACT)

BY HEBER W YOUNGKEN

Studies have been made by the author upon the microscopy of certain powdered desiccated glands of internal secretion obtained from cattle and hogs and, in the case of the thyroid and pituitary, also from sheep with a view toward providing microscopical standards for these biological products which are being more and more employed in modern organotherapy

Without microscopical descriptions of these products they would be prone to adulteration with undesirable materials by unscrupulous persons

Descriptive microscopical standards are presented for powdered desiccated thyroid suprarenal, whole pituitary, anterior pituitary, posterior pituitary, ovary, ovarian residue and corpus luteum

Various stains and reagents have been employed in the identification of the different histological elements occurring in each and the reactions of these elements to them are discussed

Powdered desiccated thyroid may be identified by its smooth to striated, hyaline fragments of colloid, some of which contain granules, minute vacuoles, crystalloidal bodies and cells together with the numerous, irregular fragments of follicular epithelium, both of which stain brown with a mixture of Mallory's stain and 1% solution of phosphotungstic acid

Powdered desiccated suprarenal may be identified by its numerous, characteristically stellate to irregularly shaped chromophile (chromaffin) cells which take a brown coloration with chromic acid test solution together with its characteristic cortical cells as examined in Delafield's hematoxylin and alcoholic eosin

Powdered desiccated whole pituitary may be identified by the numerous large, polyhedral or chromophile cells which show a coarse granulation and which show a distinct affinity for acid stains, acid fuchsin coloring them a deep red the presence of many chromophobe cells of more or less cubical, rounded or pyriform shape with few or no fine granules whose nuclei are colored blue and cytoplasm a paler blue with either Delafield's hematoxylin or a mixture of eosin and methylene blue solution, the mossy neuroglia cells with their many, slender branching processes clearly visible in a mixture of 1% phosphotungstic acid and Delafield's hematoxylin and by the presence of bipolar nerve cells

Powdered desiccated anterior pituitary can be identified by the presence of characteristic chromophile and chromophobe cells and the absence of mossy neuroglia and bipolar nerve cells

Powdered desiccated posterior pituitary may be identified by the very numerous mossy neuroglia cells and bipolar and multipolar cells and the absence of chromophile and chromophobe cells

Powdered desiccated whole ovary or "ovarian substance" is characterized by the presence of more or less distorted cubical to low columnar epithelial cells whose nuclei take a deep blue and cytoplasm a pale purple or pink color with Delafield's hematoxylin, by the rounded to irregular masses consisting of primary oocytes surrounded by connective tissue elements, the rounded to oval interstitial cells containing granules and fat droplets staining bright red with red acid dyes the numerous fibroblasts with forked ends, the numerous lutein cells often in masses, which appear yellowish in water mounts together with an abundance of dense connective tissue consisting mostly of narrow collagen fibres which swell and are colored yellow in a mixture of 1% picric acid and 1% acetic acid solution

Powdered desiccated ovarian residue shows a similar microscopic picture to powdered desiccated whole ovary except for the almost complete absence of corpus luteum material

Powdered desiccated *corpus luteum* is characterized by its numerous lutein cells, isolated or in masses, the individual cells somewhat polyhedral with spheroidal central nucleus and numerous lutein granules and fat droplets, the groups of lutein cells intermingled with fine collagen fibres and appearing yellowish or greenish yellow in water mounts

* Presented before Section N3, American Association for the Advancement of Science, Minneapolis meeting, June 27, 1935

THE DEPARTMENT OF THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY

G B JORDAN—CHAIRMAN OF EXECUTIVE COMMITTEE, A A C P, EDITOR OF THIS
DEPARTMENT

Thirty-Sixth Annual Meeting of the

AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY

HOTEL MULTNOMAH, PORTLAND, OREGON,
AUGUST 5-6, 1935

OFFICERS

President, Ernest Little, *Vice-President*
Antone O Mickelsen, *Secretary Treasurer*,
Zada M Cooper, *Chairman of the Executive*
Committee, Charles B Jordan

MONDAY, AUGUST 5TH

9 00 A M Meeting of Executive Committee—
Empire Room

9 30 A M Meetings of Teachers' Conference

Conference of Teachers of Pharmacy, Monday,
August 5th, 9 30 A.M.—Junior Ball Room

OFFICERS

Chairman, W G Crockett, *Vice-Chairman*,
Leon W Richards, *Secretary* Emery T
Motley

Program

A Round Table Discussion of Pharmaceu-
tical Technique as Described in the Syllabus

Conference of Teachers of Chemistry, Monday,
August 5th, 9 30 A.M.—Club Room.

OFFICERS

Chairman Marion L Jacobs, *Secretary*,
John C Bauer

Program

1 Instruction about Synthetics, E V Lynn
Discussed by—George L Webster and
Glenn L Jenkins

2 The Teaching of Food and Drug Analysis
C C Glover Discussed by—Russel A
Cam and Frederick Grill

Conference of Teachers of Pharmacognosy and
Pharmacology—Monday, August 5th, 9 30
A M—Colonial Room

OFFICERS

Chairman, A John Schwarz, *Secretary*,
Charles E F Mollett

Program

Topics for Discussion

1 Pharmacology Definition and Scope of
the Course for Pharmacy Majors,
Frank H Eby and H M Burlage

2 Should the Term *Materia Medica* Be
Deleted from Our Catalogs and from
State Board Examinations? C E
Mollett

3 Should Undergraduate Students in Phar-
macy Do Animal Experimentation or
Should the Course Be Taught by
Demonstration? F J Bacon

4 Biological Assays for Undergraduate
Students in Pharmacy, D B R
Johnson

5 Correlation of the Courses in Pharma-
cology and Physiology, Dr Van Loan

6 Pharmacology as a Basis for Improving
Relations with Physicians, B V
Christensen

7 Suggestions for a Course in Botany for
Pharmacy Students, H M Wilson and
Ralph Bienfang

Paper—"A Study of the Records of the Same
Class in Botany and Pharmacognosy,"
Marin S Dunn

"The British Pharmacognosy Syllabus," D
R Bienfang

Conference of Teachers of Pharmaceutical
Economics—Monday, August 5th, 9 30 A M —
Marine Room

OFFICERS

Chairman, Paul C Olsen, *Secretary*, John F
McCloskey

Program

Topics for Discussion

Trends in drug store profits 1932 1933 and
1934

Accounting records necessary and desirable
in drug stores

The operation of state fair trade acts for re-
sale price control

SESSIONS OF THE ASSOCIATION

First Session, Monday, August 5th, 1 30
P M—Junior Ball Room

Roll Call

Appointment of Committee on Resolutions
Address of the President, Ernest Little
Report of the Secretary-Treasurer, Zada M Cooper

Report of Executive Committee, Charles B Jordan

Appointment of the Nominating and Auditing Committees

Paper—"The Four Year Course in Pharmacy," C O Lee and H G DeKay

Reports of Standing Committees

Committee on Educational Standards, Edward Spease

Committee on Curriculum and Teaching Methods, Robert C Wilson

Committee on Activities of Students and Alumni, George C Schicks

Delegates to the American Council on Education, Rufus A Lyman

MONDAY, AUGUST 5TH, 6 00 P M

Annual Dinner

Address by Dean E H Lauer of the University of Washington

Second Session, Monday, August 5th, 8 00 P M—Junior Ball Room

Reports of Standing Committees (*Continued*)

Committee on Relation of Boards and Colleges, D B R Johnson

Committee on Libraries, Charles O Lee

Committee on Problems and Plans Rufus A Lyman

Papers—"Objectives and Objective Tests" For Qualitative Analysis, H G DeKay

For Organic Chemistry, C J Klemme

Syllabus Committee, J G Beard

Paper "The Teaching of Bacteriology to Pharmacy Students," George F Reddish

Reports of Special Committees

Committee on Student Branches of the AMERICAN PHARMACEUTICAL ASSOCIATION, George L Webster

Committee on the Establishment of a Pharmaceutical Corps in the United States Army, Townes R Leigh

Committee to Study List of Crude Drugs Prepared by District No 2, Heber W Youngken

Joint Session of the National Association of Boards of Pharmacy and the American Association of Colleges of Pharmacy, Tuesday, August 6th, 9 00 A M—Assembly Hall Room

Report of the Fairchild Scholarship Committee, E G Eberle

"Examination Questions, Both College and Board Questions," A B Lemon

Paper—"The Possibilities and Limitations of Coöperation between Boards of Pharmacy and Colleges of Pharmacy," Robert P Fischelis

Report of Recommendations or Resolutions Referred from District Meetings, D B R Johnson

Third Session, Tuesday, August 6th, 2 00 P M—Junior Ball Room

Reports of Special Committees (*Continued*)

Committee on Membership Standards, A G DuMez

Committee on Code Matters, W F Rudd

Committee on Food and Drug Legislation Charles B Jordan

Report of Committee on Resolutions

Reports of Special Representatives

Representative on American Council on Pharmaceutical Education, A G DuMez

Reporter on Biological Abstracts, Heber W Youngken

Representatives to National Conference on Pharmaceutical Research, Glenn L Jenkins

Representatives to National Drug Trade Conference

Representatives to the Druggists' Research Bureau, Paul C Olsen

Representative to the National Association of Retail Druggists, John F McCloskey

Report of Historian, Edward Kremers

Unfinished Business

Miscellaneous

New Business

Executive Session

Additions, if any, will appear in Official Program and under Societies and Colleges

Thirty-Second Annual Meeting of the NATIONAL ASSOCIATION OF BOARDS OF PHARMACY

HOTEL MULTNOMAH, PORTLAND, OREGON,
AUGUST 5-6, 1935

OFFICERS

President, C H Evans, *Honorary President* F W Hancock, *Vice-Presidents*, George Moulton, John Woodside, E V Zoeller, Albert Ely, Wm Muesing, C M Brewer, R C Shultz, R W Fleming, *Secretary* H C Christensen, *Treasurer*, J W Gayle

Program

MONDAY, AUGUST 5, AT 9 30 A M—FIRST SESSION—ASSEMBLY HALL ROOM

- 1 Call to Order, President C H Evans
- 2 Roll Call

- 3 Appointment of Committee on Credentials, President C H Evans
- 4 President's Address, Charles H Evans
- 5 Appointment Committee on President's Address
- 6 Report of Secretary, H C Christensen
- 7 Report of Treasurer, J W Gayle
- 8 Appointment of Nominating Committee, President Evans
- 9 Report of Executive Committee, A L I Winne, *Chairman*
- 10 Presentation of Suggested Amendments to Constitution and By-Laws, L C Lewis, *Chairman*

MONDAY, AUGUST 5, AT 1 30 P M—SECOND SESSION—ASSEMBLY HALL ROOM

- 1 Report of Advisory Examination Committee, H C Christensen, *Chairman*
- 2 Report of Syllabus Committee
- 3 Report of Legislative Committee, Mac Childs, *Chairman*
- 4 Report of Committee on National Legislation, R L Swain, *Chairman*
- 5 Report of Committee on Prerequisite, R W Fleming, *Chairman*
- 6 Report of Publicity Committee, Rowland Jones, *Chairman*
- 7 Report of Grievance Committee, W M Hankins, *Chairman*
- 8 Report of Committee on National Certificate H C Christensen, *Chairman*
- 9 Report of Committee on Minimum Standards of Technical Equipment A C Tayler, *Chairman*
- 10 Report of Committee on Pharmaceutical Jurisprudence, Roy B Cook, *Chairman*
- 11 Report of Committee on Code Matters, R L Swain, *Chairman*
- 12 Report of Banquet Committee, Linn E Jones, *Chairman*

MONDAY, AUGUST 5, AT 6 30 P M—N A B P BANQUET—ASSEMBLY HALL ROOM

Tuesday, August 6, at 9 00 A M—Joint Session.—Assembly Hall Room

National Association of Boards of Pharmacy and American Association Colleges of Pharmacy—program—see page 578

TUESDAY, AUGUST 6, AT 1 20 A M—FINAL SESSION—ASSEMBLY HALL ROOM

- 1 Reports of Vice-Presidents
 - District No 1, George Moulton
 - District No 2, John M Woodside
 - District No 4, Albert E Ely
 - District No 5, Wm C Muesing

- District No 6, Mac Childs
- District No 7, R C Shultz
- 2 Report of Committee on President's Address
- 3 Report of Department of Education, R L Swain, *Director*
- 4 Report of Committee on Constitution and By-Laws, L C Lewis, *Chairman*
- 5 Report of Resolutions Committee, A C Taylor, *Chairman*
- 6 Report of Committee on Plaque, J A J Funk, *Chairman*
- 7 Reports of Special Committees
- 8 Unfinished Business
- 9 New Business
- 10 Report of Nominating Committee
- 11 Election and Installation of Officers
- 12 Adjournment

National Conference on Pharmaceutical Research, 1935 Meeting

PORTLAND, OREGON, SATURDAY, AUGUST 3, HOTEL MULTNOMAH

OFFICERS

Chairman, E N Gathercoal, *Vice Chairman*, William J Husa, *Secretary*, John C Krantz, Jr, *Treasurer*, Fitzgerald Dunning, *Executive Committee* H V Army, R L Swain, F C Bibbins

First Session, 2 00 P M

- 1 Call to Order by Chairman
- 2 Appointment of Nominating Committee
- 3 Summary of Year's Activities and Outlook of Conference for the Future, by Chairman Gathercoal
- 4 Reports of Officers
 - a Report of Secretary
 - b Report of Treasurer
 - c Report of Executive Committee by Secretary
- 5 Reports of Standing Committees
 - (1) Physical Chemistry, Arthur Osol *Chairman*
 - (2) Bacteriology and Immunology Louis Gershenfeld, *Chairman*
 - (3) Pharmacognosy, Heber W Youngken, *Chairman*
 - (4) Pharmacology and Bioassays James C Munch *Chairman*
- 6 Roll Call of Delegates
- 7 Adjournment for dinner Arrangements will be made for a dinner for the delegates assembled

An address pertinent to the work of the Conference will be delivered

Evening Session 8 00 P M

- 8 (5) Medicinal Chemicals, Joseph Rosin
Chairman
- (6) Endocrinology, Arthur Grollman,
Chairman
- (7) Manufacturing Pharmacy, L Wait
Rising, *Chairman*
- (8) Pharmaceutical Dispensing, William
J Husa, *Chairman*
- (9) Educational Methods, A B Lemon,
Chairman
- (10) Pharmaceutical Economics, Harry
S Noel, *Chairman*
- (11) Historical Pharmacy, Charles H
LaWall, *Chairman*
- 9 Reports of Other Special Committees
- (1) Publications Edward N Gather-
coal *Chairman*
- (2) Census of Research, James C
Munch, *Chairman*
- 10 General Discussion of the Status of
Pharmaceutical Research
- 11 Election and Installation of Officers
- 12 Adjournment

Thirteenth Annual Meeting
of
PLANT SCIENCE SEMINAR

OFFICERS

President, Frank H Eby, *Secretary Treasurer*, Franklin J Bacon, *Local Secretary* Ernst T Stuhr

MONDAY, JULY 29TH

- 10 00 A M Registration at Seminar Head
quarters, North Pacific College
- 11 00 A M Report of the President
Report of the Program Commit-
tee
- 1 00 P M Tour of Portland Parks and Gar-
dens of interest

TUESDAY JULY 30TH

- 9 00 A M "An Economical and Safe Appa-
ratus for Use in the Laboratory
for Heating Inflammable Sol-
vents," Mr Bernard Melkon,
Philadelphia College of Phar-
macy and Science
- Commercial Drug Plantings in
Oregon " Prof Ernst T Stuhr
Oregon State College
- 'Studies of Phytolacca I Mor-
phology of Young Inflores-
cence,' Prof E H MacLaugh-

lin Philadelphia College of
Pharmacy and Science

'The Importance of the Library
in Teaching Pharmacognosy,"
Prof Frank H Eby, Temple
University

1 00 P M Field Trip to the Leach Gardens

WEDNESDAY, JULY 31ST

- 9 00 A M The Kilmer Memorial Garden '
Dr Marin S Dunn Philadel-
phia College of Pharmacy and
Science
- Toxicity of Certain Salts to the
Growth of *Penicillium Itali-
cum*," Mr Bernard Melkon
Philadelphia College of Phar-
macy and Science
- 10 00 A M The Cultivation of Digitals at
the Squire Valleevue Medical
Plant Garden " Dr F J Ba-
con Western Reserve Uni-
versity
- Round table Discussion on the
Cultivation of Medicinal Plants
- 1 00 P M Estacada field trip to Ginseng and
Hydrastis projects

THURSDAY, AUGUST 1ST

- 8 00 A M Loop trip (west highway), Port-
land, McMinnville Taft, New
port Corvallis (mileage approxi-
mately 180 miles)
- 1 00 P M Tour of inspection Oregon State
College

FRIDAY AUGUST 2ND

- 9 00 A M Peavy Arboretum
- 1 00 P M Return to Portland (east high-
way) Corvallis, Salem Oregon
City Portland (mileage ap-
proximately 90 miles)
- 8 00 P M Business Session of the Seminar
Report of Committees
Report of Secretary-Treasurer
Election of Officers

Mrs Harvey W Wiley has donated a collec-
tion of Pharmacopoeial circulars and other
records PROCEEDINGS and YEAR BOOKS and
other volumes related to pharmacy to the
American Institute of Pharmacy

The programs of the Sections and Con-
ferences will be found under Societies and
Colleges'

ASSOCIATION BUSINESS

AD INTERIM BUSINESS OF THE COUNCIL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, 1934-1935

June 5 1935

Office of the Secretary, 2215 Constitution Ave Washington, D C

LETTER NO 18

To the Members of the Council

97 *Use of the Text of the N F VI* A vote is called for on Motion No 33 (Council Letter No 17 page 512) Voting card enclosed

98 *Tentative General Program for the Eighty Third Meeting* At the request of its president the scheduled dinner of the Kappa Epsilon Sorority on Thursday, August 8th be taken from the program since this organization has no chapter on the coast

The following letter has been received from Secretary Dargavel of the N A R D

'Thank you very much for the invitation extended to attend the Joint Meeting of the Council of the A P H A and the Executive Committee of the N A R D Please be advised that we shall be very glad to accept this invitation and meet with you during your convention There will be at least three members of the Executive Committee at your meeting '

As no further comment on the tentative program has been received a vote on Motion No 34 (Council Letter No 17, page 513) is called A voting card is enclosed and the members of the Council are requested to indicate thereon whether they prefer the meeting of the Council on Saturday, August 3rd or on Sunday, August 4th

June 22, 1935

LETTER NO 19

To the Members of the Council

99 *Printing and Binding Recipe Book, II* At the time the contract for the printing and binding of the N F VI was awarded to the Mack Printing Company (see Council Letter No 10, 1932-1933, A P H A JOURNAL August 1933 page 791) for which their bid was the lowest submitted, the revision of the Recipe Book, Second Edition, had not progressed sufficiently to justify the consideration of a contract for its manufacture When it was recently decided to request bids for the printing and binding of R B II, the Mack Printing Company offered to accept the contract on the same price basis as that for the N F VI, with necessary increases for the higher cost of paper higher cost of binding and electrotypes, and higher cost of printing due to the shorter run The contract limits the edition to 10,000 copies of which only 5000 are to be bound The sales of R B I have totaled about 5500 copies

The following communication has been received from Chairman DuMez of the Committee on Publications

'I am returning herewith the bid from the Mack Printing Company for the manufacture and sale of the Recipe Book II

The price basis for this bid is the same as that which the Mack Company used for the Pharmacopœia and National Formulary, except that the printing will have to be done in shorter units, which will increase the price somewhat, and there will be a slight increase in cost for paper and the cost for binding and electrotypes

"These are legitimate increases and it is therefore recommended that the contract be let to the Mack Printing Company"

(Motion No 35) *It is moved by DuMez that the contract for printing and binding the Pharmaceutical Recipe Book be awarded to the Mack Printing Company Easton, Penna, on the basis of their proposal of May 10, 1935* A vote on this motion will be called for in about ten days

100 Exemption from Taxation On April 5, 1935, H A B Dunning and L F Kelly attended a hearing before the Commissioners of the District of Columbia, on the petition of the ASSOCIATION for tax exemption on its property, and furnished the information requested about the ASSOCIATION and its activities S L Hilton could not attend the hearing on account of illness

The following communication has not been published earlier since it was necessary to check the re numbering of certain lots as explained below

COMMISSIONERS OF THE DISTRICT OF COLUMBIA
EXECUTIVE OFFICE
WASHINGTON

A O 63,726

May 10, 1935

ORDERED

That the property of the AMERICAN PHARMACEUTICAL ASSOCIATION known as Lots 3, 4, 5 16, 17, 801, 802 806 and 807, Square 62, be exempted from general taxes as of January 1, 1934, and such exemption shall continue as long as said property is used for its present purposes, provided, that all taxes interest, etc against said property be paid to the date exemption is allowed

By order of the Board of Commissioners, D C

R M BRENNAN
Secretary to the Board

Official copy furnished

Mr E F Kelly, *Secretary*, AMERICAN PHARMACEUTICAL ASSOCIATION,
2215 Constitution Ave , N W

On account of the closing of Water Street between 22nd and 23rd Streets and the transfer of property between the United States of America and the ASSOCIATION in accordance with Public Resolution No 18, signed May 1932, and as set out in Council Letter No 3, 1932-1933, see JOURNAL, A PH A , Oct 1933, pages 1058 to 1065, it became necessary to renumber certain of the lots in Square 62 as shown on the plot plan printed on page 1063

The parts of Lots 12, 13, 14, 15 and 17 transferred to the United States as shown in red on the plan, are now numbered Lot 805 The remainder of these lots is now numbered Lot 806 The property transferred to the ASSOCIATION by the United States as shown in yellow on the plan and comprising part of the bed of Water Street and part of U S Reservation No 332B is numbered Lot 807

The order of exemption, therefore, covers all of the property owned by the AMERICAN PHARMACEUTICAL ASSOCIATION

Taxes on the property were paid including the first half of 1933-1934 or until March 1, 1934

101 Applications for Membership The following applications properly endorsed and accompanied by the first year's dues have been received

No 219, Dufae Lee, 447 Vine St , Clinton Ind , No 220 Bertam Francis Jones 137 Willowdale Ave , Montclair, N J , No 221, Jacob Philip Beisels, 1082 Fifth Ave North Bergen N J , No 222, Wilham M Dick, 80 College St , New Haven Conn , No 223 Harry A Cohon 502 S W Yamhill, Portland, Ore , No 224, Mortimer Irvin Cobin 1521 Bryant Ave Bronx N Y C , No 225, Stanley Everett Cairncross 64 Prospect Ave , Hackensack N J , No 226 Philip Ting Fee Lam, 505 W Ocean Ave , Long Beach, Calif No 227 Roller Lynn Tooley Central City Nebr , No 228 Charles Samuel Gore, Veterans Admin , Coatesville Penna , No 229, Ignatius Joseph Bellafiore, 588 Tenth St , Brooklyn, N Y No 230 Abraham H Lee 940 East 174th St , Bronx, N Y C , No 231, Sister M Getulus Honorowski, 1120 N Leavitt St Chicago, Ill , No 232, Florence Marie Hatter, 5601 N Crawford Ave Chicago Ill , No 233 Samuel Stelmah, 1796 Vyse Ave , Bronx, N Y C , No 234 Edward Aaron Bachman 439 N W Broadway, Portland, Ore , No 235 George A Tozer, 1608 California Everett, Wash , No 236 Henry Mishkin, 5537 Maryland Ave , Chicago Ill , No 237, Shelley Braverman, 271 Madison Ave , New York N Y , No 238 Paula Towle San Francisco Calif , No 239 Elsie Hambly Bennetts, 999 Thorne Ave , Fresno, Calif , No 240, W Volney Bursell 938 Villa St , Mountain

View, Calif , No 241, Gustave B Faure, 325 First St , Corte Madera, Calif , No 242, Harold Ralph Hefner 860 Ashberry St , San Francisco Calif

(*Motion No 36*) *Vote on Applications for membership in the American Pharmaceutical Association*

E F KELLY, *Secretary*

LETTER NO 20

July 12 1935

To the Members of the Council

102 *Use of the Text of N F VI* Motion No 33 (Council Letter No 17, page 512) has been carried and Dr Leech has been so advised

103 *General Program for the Eighty Third Annual Meeting* Motion No 34 (Council Letter No 17, page 514 and Council Letter No 18, page 581) has been carried and the general program is approved

Preference for the date of the Council meeting in Portland is not definite as several members did not express themselves Chairman Hilton requests that the members of the Council be advised that the meeting will be called on Saturday, August 3rd at 10 A M If a quorum is not present at that time the meeting will be called at 10 A M, Sunday, August 4th

104 *Printing and Binding Recipe Book II* A vote is called for on Motion No 35 (Council Letter No 19 page 581)

105 *Election of Members* A vote is called for on Motion No 36 (Council Letter No 19, page 583)

106 *Applications for Membership* The following applications properly endorsed and accompanied by the first year's dues have been received

No 243 Isidore Greenberg, 124 Division Ave Brooklyn, N Y , No 244 C A Anderson Litchfield, Minn , No 245, St Elmo Brady Fisk University, Nashville, Tenn , No 246 Muriel Alice Stoner Montana Deaconess Hospital Great Falls Mont , No 247, Anthony John Szczesniul, 16 Railroad Ave , Beacon Falls, Conn , No 248, David Goldstein, 734 Vermont St Brooklyn, N Y , No 249, Arthur M Thompson 55 Pacific St , Rockland, Mass No 250, Ebe J Hudon, 11 B Moulton St , Lynn, Mass , No 251, Walter J Lusinski 36 Cottage St , Lynn, Mass , No 252, Richard C O'Leary 169 Forest Ave Brockton Mass , No 253 Nicholas A Kafalas, 7 Horton St , Newburyport Mass , No 254, John C Klein, Richardton N Dak , No 255, William V Verbryke, 926 W Delaware Ave , Toledo Ohio, No 256 Kenei Oshiro, 5838 Gregory Ave , Hollywood Calif , No 257, Edward A Bachman 439 N W Broadway Portland, Ore , No 258, John T Dillon, St Andrews Hotel Portland Ore , No 259 Arthur P Wilson 3416 N E 68th Ave , Portland, Ore , No 260, Thomas I McGuire, 2007 N E 61st Ave Portland, Ore , No 261, Frederick E Klohn, 6914 S E 21st Ave Portland Ore

(*Motion No 37*) *Vote on Applicants for membership in the American Pharmaceutical Association*

E F KELLY, *Secretary*

THE FORMULARY OF THE UNIVERSITY HOSPITAL UNIVERSITY OF MICHIGAN

The AMERICAN PHARMACEUTICAL ASSOCIATION is indebted to Harvey A K Whitney Chief Pharmacist of Ann Arbor Mich University Hospital, for a copy of the volume The formulary is very conveniently arranged and serves a useful purpose, not only for the pharmacist but for the physicians who are enabled to make use of Pharmacopoeial and National Formulary preparations and for pharmacists to cooperate with them in the writing of prescriptions The book has been prepared in such a way that additional matter

can be added and without disturbing the order It is pleasing to note the care and study which has been given in arranging the book All measures have been recorded in the metric system and internal liquid preparations have been constructed on the basis of fifteen doses Prescriptions that generally may be ordered by title are frequently expressed in amounts on the basis of 100 so that percentage concentrations may be easily calculated The book appeals to us as well worth while and the arrangement throughout shows the study and care which the author has given to the compilation

EDITORIAL NOTES

SCHOOL OF PHARMACY OF OREGON STATE MONTHLY

The *Oregon State Monthly* issued a School of Pharmacy number. The first page of the text has a picture of the American Institute of Pharmacy and of President Robert P. Fischelis. Another article relates to the convention of three state conventions to be held in Portland during A. P. H. A. Convention week. Dean Adolph Zieffle speaks of pharmacy and the code of ethics and he also writes of pharmacy as a life vocation.

FEDERAL TRADE COMMISSION WRITING CODES

The Federal Trade Commission has announced its readiness to negotiate voluntary codes. The commission is writing 170 industries and it is said there is evident disposition to maintain standards. Industries now desiring codes are instructed to file applications describing briefly their business, what is expected of codes in the way of outlawing unfair methods of competition and the representative character of those applying.

EXCISE TAX CONTINUED FOR TWO YEARS

A new tax measure extends the excise tax for another two years and is in line with recommendation of the Ways and Means Committee to continue all present federal excise taxes two years, some additions have been made to the list of items taxed. Multiple taxation has been given consideration.

A NEW SECTION TO THE BRITISH POISONS LIST

The *Pharmaceutical Journal* of May 25, 1935, states that "since the Draft Poisons List and Rules were published in *The Journal* (British) no official communication has been made by the Poisons Board, nor is it yet known when the final report will be ready. An interesting indication of what may be expected so far as one class of drugs is concerned may be seen from a remark made by Sir William Willcox, a member of the Board, when he delivered the annual oration to the Medical Society of London. After showing how a variation in the pharmacological action of barbituric compounds follows the substitution of an ethyl

grouping by alkyl, phenyl or other radical, he stated that when the report of the Poisons Board was issued it would be seen that regulations are to be made limiting the supply of certain drugs of powerful therapeutic action, to medical prescription. The importance of this declaration will at once be recognized, it introduced a method of controlling the sale and supply of substances falling within the schedule similar to that in force under the Dangerous Drugs Acts. It is almost a certainty that all derivatives and compounds of barbituric acid which have been shown to possess habit-forming properties or danger from overdosage will be scheduled in this manner. Public opinion as expressed by some news papers, has demanded it even though it remains unmoved by the much larger number of accidental and suicidal fatalities from lysol and other cresylic disinfectants. What other drugs will in future be obtainable on prescription only we can only hazard a guess. Possibly the dinitrophenols which ought only to be taken under the closest medical supervision will be placed in this category, and to judge from the authoritative opinions expressed when phenylcinchoninic acid was placed in the first part of the present Schedule of Poisons, it too, may be found in the new section. At present, however we can only conjecture, and, in common with all pharmacists, must await the report of the Board before knowing definitely what modification it is likely to make in our own business."

PHARMACY IN JAPAN

The Japanese Health Bureau of the Department of Home Affairs has recently announced the number of pharmacists and physicians at the end of 1933. The total number of pharmacists is given as 21,802, classified as follows: 14,847 engaged in the preparation of medicine and in the sale of medicine, 2371 engaged in the preparation of medical preparations in hospitals and clinics, and 1323 owners or managers of dispensaries.

Tokyo has the larger number of pharmacists numbering 5850 or 9.82 pharmacists for every 10,000 population. The total number of pharmacists throughout Japan is 3.24 pharmacists per 10,000 population.

The total number of physicians throughout Japan was given as 52,792.

PERSONAL AND NEWS ITEMS

The Minnesota State Pharmaceutical Association presented Dean Frederick J Wulling, in the form of an engrossed scroll, resolutions formally recognizing his distinguished work for pharmacy for a period of over fifty years beginning with March 10, 1884

Ragnar Almin and Charles V Netz were continued, respectively, as *chairman* and *secretary treasurer* of the Northwestern Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION at the last meeting of the Branch

Dr Edward Kremers, head of the department of pharmacy at the University of Wisconsin since 1892, retired from that position on June 30th He became a member of the AMERICAN PHARMACEUTICAL ASSOCIATION in 1887 and a regular contributor to the sections of the ASSOCIATION and father of the Section on Historical Pharmacy, he is a member of American and foreign historical societies

Dr Kremers is an international authority on volatile oils member of many American and foreign pharmaceutical and chemical organizations and author of many papers on chemistry and drugs He has been at the University since 1890 He is the author of the English edition of *Gildemaister-Hoffman Kremers—"The Volatile Oils"*

Dr Kremers earned his Ph D degree at the U of Gottingen, he graduated in Pharmacy at the University of Wisconsin and received the Ph M from the Philadelphia College of Pharmacy

Lawrence W Renner, secretary of Stark Co (Ohio) Pharmaceutical Association, has completed a study of law and received a degree of LL B Mr Renner is a graduate pharmacist

Idaho State Pharmaceutical Association has issued a bulletin carrying the greater part of an interesting paper by Dean Eugene O Leonard The paper dealt with the early history of pharmacy, bringing it to modern times and pointing out some of the important services which the pharmacist renders and how necessary it is to give the most careful attention to pharmaceutical practice Professor Leonard pointed out the importance of cleanliness and careful business practice

The Alabama Association Registration List includes three of its Veterans, namely L C Lewis, Tuskegee J W Durr, Montgomery, and Samuel Williams, Troy

John A Weeks and Booker T Latimer, mem-

bers of the Texas and Arkansas Board of Pharmacy, respectively, will retire after having served as board members for twenty five years or more

Mr and Mrs J T Coulson, Mr and Mrs C J DeWoody of Dallas, Texas and Mr and Mrs Charles Sutton of Merck & Co, drove to the city of Mexico for a vacation

E von Hermann, of Chicago celebrated his 81st birthday this month He still gives attention to the work of his pharmacy on the 14th floor of a Chicago office building

Herbert W Parker, of Jonesboro, member of the Arkansas Board of Pharmacy, is being urged for Governor

W M Hankins was guest-speaker at a dinner at the University of Florida His subject was—"The Importance of the Little Things in Pharmacy" Mr Hankins took the initiative for the establishment of the School of Pharmacy He is a former president of the National Association of Boards of Pharmacy and of Florida Pharmaceutical Association The dinner was sponsored by the Rho Chi Society

J W Gayle, Kentucky, holds the record of tenure in office as secretary of a State pharmaceutical association He has been secretary of Kentucky Pharmaceutical Association for 47 years

Dean Charles H LaWall was taken seriously ill while on an automobile trip and is now in a Harrisburg Pa hospital where he is slowly recovering Professor LaWall was to have sailed for Copenhagen on July 3rd, to attend a meeting of the Committee upon Uniform Method of Opium Assay, as representative of the U S Treasury Department Regret is expressed because of his illness and inability to serve on the important committee He was also to be delegate at several pharmaceutical meetings representing the AMERICAN PHARMACEUTICAL ASSOCIATION

THE ITALIAN PHARMACY ACT

The Italian Pharmacy Act has been revised Among the requirements a pharmacy must carry all the medicaments of the Pharmacopœia Inspection of the pharmacy in various details is provided It is also provided that the pharmacy must have a Pharmacopœia for use by the public

OBITUARY

C P VAN SCHAACK

Cornelius Peter Van Schaack, member of the AMERICAN PHARMACEUTICAL ASSOCIATION since 1905, vice-president of Van Schaack Mutual, Inc., wholesale druggist, Chicago, died at his home in Wilmette, a suburb of Chicago, July 2nd

Mr Van Schaack was born May 26, 1863, in Manlius, N Y He engaged with George H Schaefer & Co in Madison, Ia, and several years later, about 1882, with a brother Robert H, he became associated with their father, Peter Van Schaack, in the wholesale drug business in Chicago, started by Brinkerhoff & Penton The father had entered the business in 1870 In 1885 the firm name became Peter Van Schaack & Sons and under this name the business was incorporated in 1900, a merger was effected under the Roosa-Ellis plan and the name of 'Mutual Drug Company of Chicago,' Mr Van Schaack became vice-president but retired in 1933, after fifty four years of active connection with the wholesale drug business

The deceased became a member of the AMERICAN PHARMACEUTICAL ASSOCIATION in 1905 and was deeply interested in its activities, Mrs Van Schaack joined him in the membership The latter survives with three sons, Cornelius Peter Harding Byford and Eric Van Schaack

MARION DORSET

Dr Marion Dorset—known for development of a hog cholera serum, the tuberculin test for

milk cows and other work for the Department of Agriculture—died at his home in Washington, July 14th He also developed a serum for the prevention of virulent diarrhea in poultry He had been with the department since 1894, and at his death was chief of the bio-chemical division

The deceased was born in Columbia Tenn December 14, 1872 He studied at George Washington University and at the University of Pennsylvania receiving his M D degree at the former institution He was a member of the American Public Health Association the American Chemical Society and the Society of American Bacteriologists He was a fellow of the American Association for the Advancement of Science

HAROLD W SIMPKINS

Harold Winslow Simpkins, treasurer and general sales manager of the Mallinckrodt Chemical Works, St Louis, died July 11th, after a prolonged illness

Mr Simpkins was born in St Louis, August 16 1885 After attending Smith Academy St Louis, he prepared at St Paul School Concord, N H, and entered Harvard University He was graduated with the degree of bachelor of science in 1907 In 1917 he went with the Mallinckrodt Chemical Works, and in 1925 he became treasurer and sales manager He succeeded H W Huning as general sales manager, January 1, 1931

TENNESSEE PHARMACEUTICAL
ASSOCIATION

Tennessee Pharmaceutical Association is making preparations for its Golden Anniversary meeting July 15th to 18th in Memphis under the direction of Edward Sheely The *Southeastern Drug Journal* for July contains a complete list of the former presidents of the Association, beginning with 1886

The Commencement Exercises of Western Reserve University School of Pharmacy were presided over by Dean Edward Spease and the principal address of the evening was made by Dean C B Jordan.

THE COPELAND BILL HEARING

Congressional leaders were urged by President Roosevelt July 15th, to pass legislation at this session strengthening the pure food and drug laws

This information was given to the House Interstate Commerce Committee by Chairman Rayburn who will have charge of the Senate approved Copeland bill

Representative Chapman of Kentucky is Chairman of the Sub Committee in charge of the hearings The same announcement stated that the committee will have before it two other bills—the Mead and Sirovich measures

Hearings started July 22nd

SOCIETIES AND COLLEGES

Programs of General Sessions, Council,
House of Delegates and Sections

For General Program of the ASSOCIATION see June JOURNAL page 514 For programs of American Association Colleges of Pharmacy, National Association of Boards of Pharmacy, National Conference on Pharmaceutical Research and Plant Science Seminar, see pages 577-580 of this issue

Officers of the Association—*President* Robert P Fischels, *Honorary President* J K Lilly *First Vice President*, George D Beal, *Second Vice-President* Oscar Rennebohm, *Secretary* E F Kelly, *Treasurer*, C W Holton, *Editor of the Year Book*, A G DuMez *Editor of the Journal* E G Eberle

Officers-Elect—*President* Patrick H Costello, *First Vice President*, Frank A Delgado *Second Vice President*, J Lester Hayman, *Members of the Council* James M Beal C H LaWall R L Swain

THE GENERAL SESSIONS OF THE
AMERICAN PHARMACEUTICAL
ASSOCIATION

SESSIONS, WEDNESDAY AUGUST 7TH, 9 00 A M
THURSDAY AUGUST 8TH, 2 00 P M FRIDAY,
AUGUST 9TH 8 00 P M

First General Session, Wednesday, August 7th,
9 00 A M—Main Ball Room

- 1 Call to Order
- 2 Reading of Communications
- 3 Annual Report of the House of Delegates, Rowland Jones Jr, *Chairman*
- 4 Address of the President, Robert P Fischels
- 5 Unfinished Business
- 6 New Business
- 7 Report of the Committee on Maintenance, H A B Dunning, *Chairman*
- 8 Address, The Practical Value to the Pharmacists of the Activities of the Council on Pharmacy and Chemistry of the American Medical Association Joseph A Pettit
- 9 Address Dentistry and Pharmacy " Dr P T Meany

Second General Session, Thursday, August 8th,
2 00 P M—Main Ball Room

- 1 Minutes of the First General Session
- 2 Reading of Communications
- 3 Report of the House of Delegates on the President's Address and Other Matters, Rowland Jones, Jr, *Chairman*
- 4 Address, 'The United States Pharmacopœia and the Federal Food and Drugs Act' James H Beal
- 5 Report of the Special Committee on The Council on Pharmaceutical Practice," E F Cook *Chairman*
- 6 Address 'Prescription Department Economics—Some High Lights of the Revised Edition of the Professional Pharmacy" (with lantern slides), Frank A Delgado
- 7 Symposium on Prescription Pricing
- 8 Unfinished Business
- 9 New Business

Third General Session, Friday, August 9th
8 00 P M—Main Ball Room

- 1 Minutes of the Second General Session
- 2 Reading of Communications
- 3 Final Report of the House of Delegates
- 4 Unfinished Business
- 5 Award of the Ebert Prize
- 6 Installation of Officers
- 7 Address of the President
- 8 Final Adjournment

COUNCIL OF THE AMERICAN PHARMA-
CEUTICAL ASSOCIATION

All sessions will be held in the Cameo Room

Officers and Members of the Council—*Chairman*, S L Hilton, *Vice Chairman*, James H Beal, *Secretary*, E F Kelly, Robert P Fischels, C W Holton, Oscar Rennebohm, George D Beal A G DuMez E G Eberle H V Army, H C Christensen Walter D Adams, H A B Dunning W Bruce Philip, Charles H LaWall C E Caspari

SESSIONS

A meeting will be called Saturday, August 3rd 10 00 A M—if no quorum is present the meeting will be called Sunday, August 4th, at 10 00 A M Other meetings are scheduled for Thursday 9 00 A M and Friday, 10 00 P M

HOUSE OF DELEGATES OF THE A P H A

OFFICERS

Chairman, Rowland Jones, *Vice Chairman*, S A Williams, *Secretary*, E F Kelly

First Session, Tuesday, August 6, 1935, 1 30 P M—Grand Ball Room

- 1 Call to Order
- 2 Roll Call of Delegates
- 3 Reception of Fraternal Delegates
- 4 Opening Remarks by the Chairman Rowland Jones, Jr
- 5 Appointment of Committee on Nominations
- 6 Appointment of Committee on Resolutions
- 7 Annual Report of the Council, E F Kelly, Secretary
- 8 Report of the Treasurer, C W Holton
- 9 Report of the Secretary, E F Kelly
- 10 Reports of Delegates to Other Organizations (including International Pharmaceutical Federation, American Association for the Advancement of Science and National Drug Trade Conference)
- 11 Receipt of Resolutions, Reports and Other Communications—all of which must be in writing
- 12 New Business

Second Session, Wednesday, August 7, 1935, 8 00 P M—Grand Ball Room

- 1 Roll Call of Delegates
- 2 Reading and Adoption of the Minutes of the First Session
- 3 Receipt of the Address of the President of the AMERICAN PHARMACEUTICAL ASSOCIATION
- 4 Receipt of Reports and Other Communications from the Association, Council and Sections
- 5 Receipt of Resolutions Reports and Other Communications—all of which must be in writing
- 6 Reports of the Committees on the Study of Pharmacy, R P Fischelis, on Cosmetics, H C Muldoon, on Local Branches Adolph Ziefle, on Legislation, Ambrose Hunsberger, on U S Pharmacopœia C C Glover, on Pharmaceutical Syllabus J C Beard, on Pharmacy Week, Anton Hogstad, Jr, on Horticultural Nomenclature H W Youngken, on Physiological Testing, J C Munch, on Weights and

Measures, P H Costello, on William Procter, Jr, Memorial Fund, J E Hancock, on International Pharmaceutical Nomenclature, A G DuMez

- 7 Election of the Honorary President, Secretary and Treasurer of the Association upon Nomination by the Council
- 8 Report of the Committee on Nominations
- 9 Report of the Committee on Place of Meeting
- 10 Report of the Committee on Resolutions
- 11 Unfinished Business

Thrd Session, Friday, August 9, 1935—2 00 P M—Grand Ball Room

- 1 Roll Call of Delegates
- 2 Reading and Adoption of the Minutes of the Second Session
- 3 Receipt of Reports and Other Communications from the Association, Council and Sections
- 4 Reports of the Committees on Press Relations, E F Kelly, on Pre requisite Legislation C B Jordan, on Endowment Fund, J H Beal, on Pharmacy Corps in the U S Army H E Kendig, on Transportation, T J Bradley, on Prescription Tolerances, H H Schaefer to Draft Model Act Restricting Distribution of Drugs and Medicines to Pharmacists, W B Philip on National Code Matters, E F Kelly, on Professional Relations, L A Seltzer, on Development of Pharmacy Laws, R L Swan, on State Codes, C L O'Connell, on Council on Pharmaceutical Practice E F Cook
- 5 Final Report of Committee on Resolutions
- 6 Unfinished Business
- 7 Installation of the Chairman and Vice-Chairman of the House of Delegates
- 8 Final Adjournment

SCIENTIFIC SECTION

OFFICERS

Chairman, E V Lynn, *First Vice Chairman*, H M Burlage, *Second Vice-Chairman* R E Schoetzow, *Secretary*, F E Bibbins, *Delegate to the House of Delegates*, L W Rowe

First Session, Wednesday, August 7th, 2 00 P M—Assembly Hall

Program

- 1 Chairman's Address E V Lynn
- 2 Secretary's Report, F E Bibbins

- 3 Committee Reports, Board of Review of Papers, F E Bibbins, *Chairman*
Committee to Cooperate with the National Conference on Pharmaceutical Research, John C Krantz, Jr, *Chairman*
Committee on Monographs, E E Swanson, *Chairman*
- 4 Appointment of Nominating Committee
- 5 General Business
- 6 Papers

'A Note on the Action of Alkalies and Alkali Salts on Antipyrine" Loyd E Harris and Ercell D Tebow

'The Tests for Redistilled Water in the National Formulary VI Monograph," R S Adamson, R K Snyder and E N Gathercoal

"A Note on the Assay of Mass of Ferrous Carbonate," John C Krantz, Jr, and C Jelleff Carr

'A Simplified Assay for the Official Iodine-Iodide Solutions," William F Rein-dollar

"The Bacteriocidal and Bacteriostatic Value of Colloidal Cadmium Proteinate" W A Lott and W G Christiansen

'Antiseptic Solutions" Esther Meyer and E N Gathercoal

'Antiseptics—a Comparative Study of Laboratory and Practical Tests," George F Reddish

Comparison of Nessler's Reagent Test with Other Tests for Aldehydes in Ether," E C Billheimer, F VanDeripe, F F Berg and F W Nitardy

'A Modified Nessler's Reagent Test for Aldehydes in Ether' E C Billheimer, F VanDeripe, F F Berg and F W Nitardy

The Official Sulphur Ointments and Their Assay," Henry M Burlage and Charles E Brady

Bismuth-Sodium Potassium Tartrate Solutions" A H Clark

'A Further Note on the Stability of Sodium Sulphate" A H Clark and Solomon Gershon

"A Rapid Method for Standardizing Silver Nitrate Volumetric Solution," Robert D'Orazio

'Studies on the Determination of Camphor in Camphor Liniment IV The Use of Antioxidants" Chas F Poe

"The Addition of Strong Hydrogen Peroxide in the Determinations of Nitrogen in Organic Compounds," Chas F Poe and Bartlett T Dewey

'Duturic Acid, a Literature Review" Ralph W Clark

A Study of the U S P Thyroid Assay," George D Beal and Chester R Szalkowski

The Assay of Official Preparations for Phenol," Glenn L Jenkins and Melvin H Dunker (Presented by title)

'Observations on Opium Assay" Joseph Rosin and C J Williams

"Opium Assay, Assay Hydrolysis Method for" G E Mallory and Peter Valaer, Jr (Presented by title)

"The Assay of Official Syrups Containing Hypophosphites" Glenn L Jenkins and Charles F Bruening (Presented by title)

'The Assay of Official Hypophosphite Salts," Glenn L Jenkins and Charles F Bruening (Presented by title)

'Organic Medicinal Preparations Containing Arsenic, the Assay of" Edward J Hughes (Presented by title)

'Some Mercurated Derivatives of Thymol and Carvacrol" Joseph B Burt (Presented by title)

'Mercury Derivatives of Azo Dyes," Wm Braker and W G Christiansen

Phenyl Mercury Nitrate and Some Other Phenyl Mercury Salts" T B Grave, S E Harris and W G Christiansen

Second Session, Thursday, August 8th, 9 00 A M —Assembly Hall

7 Papers

'Studies on the Pharmacology of Trichlor ethylene ' John C Krantz, Jr, C Jelleff Carr and Ruth Musser

Absorption of Drugs by the Human Skin," A Richard Bliss Jr

The Effectiveness of Theelol by Oral Administration" L W Rowe and A E Simond

Notes on the Colorimetric Assay of Digitalis by the Knudsen and Dresbach Method ' F A Upsher Smith

'Comparison of Six Methods in Assaying the New Ergot Principle" Edward E Swanson, Chester C Hargreaves and K K Chen

- 'F E Ergot—Apparent Increase in Activity Due to Acid,' F F Berg
- "A Toxicological Study of the Cutaneous Secretions of the Salamander, *Triturus torosus* (Rathke)," Ernst T Stühr
- 'Dialkyl Amino Acetylureas,' F C Daniels
- "A Study of the Assay of Aconite and the Stability of Its Preparations," Geo L Baker and C B Jordan
- The Fatty Oil of *Podophyllum Peltatum*, 'Arthur H Uhl
- 'Evaluation of a Deterioration Factor in Liquid Petrolatum,' P L Burrin, A G Worton and F E Bibbins
- 'A New Silver and Mercury Colloidal Compound,' Earl Voelker
- "Modern Pharmaceutical Research Problems," Henry J Goeckel
- 'Some Thymol Derivatives of Possible Medicinal Value,' F A Gilfillan and John R Merritt
- Solution Cresol Compound—The Variation of Phenol Coefficient when Different Oils Are Used for Saponaceous Base "P L Burrin, A G Worton and F E Bibbins
- 'Ephedrine Synthesis I The Preparation of Propiophenone Diethyl Acetal and of 1-Phenyl 1-Ethoxy Propene-1," Ernest L Beals and F A Gilfillan
- "Strychnine IV Lethal Dose Studies on Cattle and Sheep," J C Ward and F E Garlough
- 'Strychnine V Variations in Response of the Same and Different Species of Rodents,' A W Moore
- "Strychnine VI Variations in Physiological Action of C P Strychnine" J C Ward, J C Munch and F E Garlough
- "The Detoxification of Strychnine Sulphate by Pentobarbital Sodium," Edward E Swanson
- "The Preparation of *p* Butyl Saligenin," Robb V Rice, W C Hardin and Glenn L Jenkins (Presented by title)
- "Studies on Barbiturates XI Further Contributions to Methods of Barbituric Research," Charles R Linegar, James M Dille and Theodore Koppanyi (Presented by title)
- "A New Crystalline Compound from Catnip," Minnie Meyer and Edward Kremers (Presented by title)
- "A Chemical Examination of the Fatty Oil of Poke Root," Glenn L Jenkins and Samuel W Goldstein (Presented by title)
- "Rational Application of the Earthworm as a Test-Object in the Evaluation of Vermicides" Glenn L Jenkins and L L Manthey (Presented by title)
- "The Importance of Kidneys in the Standardization of Digitalis" B Boucek (Presented by title)
- "A Comparative Study of the Pharmacological Actions of Natural and Synthetic Camphor," B V Christensen and H J Lynch (Presented by title)
- Cyanide Poisoning and Its Treatment," K K Chen Charles L Rose and G H A Clowes (Presented by title)
- 'Pharmacological Action of the Alkaloid of Han fang chi," K K Chen, A Ling Chen, Robert C Anderson and Charles L Rose (Presented by title)
- 'Action of Chinese *Corydalis* Alkaloids,' K K Chen, Robert C Anderson and T Q Chou (Presented by title)
- Joint Session Scientific Section and the Section on Practical Pharmacy and Dispensing, August 8th, 8 00 P M —Assembly Hall
- 8 Report on the U S Pharmacopœia, E Fullerton Cook
 - 9 Report on the National Formulary E N Gathercoal
 - 10 Report on the Recipe Book, J Leon Lascoff
 - 11 Report of Committee on Unofficial Standards, John C Krantz, Jr
 - 12 Report of Committee on Glass Standardization H V Army
 - 13 Report of Committee on Ebert Prize G L Jenkins
 - 14 Report of Committee on Collection of Information Pertaining to Professional Pharmacy, Marvin J Andrews
 - 15 Report of Committee on Prescription Tolerance
 - 16 Papers
- "Daphnia—The Living Reagent" (with motion picture), Arno Viehoever
- "Biochemistry of *Podophyllum Peltatum*," Arno Viehoever and Harry Mack
- Third Session, Friday, August 9th, 9 00 A M —Assembly Hall
- 17 Papers
- "The Alkaloidal Content of Oregon Grown *Cytisus Scoparius*," F A Gilfillan and Felipe Patricio Logan
- 'Studies on Cudbear' E H Wirth L E Martin and P G Soderdahl

- "Morphological Studies on Polygala Senega,"
Paul D Carpenter
- 'Studies on Poplar Bud," Gerston Bruch
and Elmer H Wirth
- A Study of Lacinaria Species " B V Christensen and G M Hocking
- 'Differentiating Characteristics of Glycyrrhiza Plants " Arno Viehovever
- 'A Microscopy of Powdered Desiccated Thyroid and Suprarenal Glands " Heber W Youngken
- "Drug Extraction V The Extraction of Belladonna Root with Glycerinic Menstrua " W J Husa and Louis Magid
- A Method of Preparation of Buffers for Prescriptions ' N Allen
- 'Drug Extraction VI Determination of the Pressure Exerted by a Drug during Percolation " W J Husa and Louis Magid
- Drug Extraction VII The Effect of Method of Packing on Efficiency of Percolation " W J Husa and C L Huyck
- Drug Extraction VIII The Effect of Maceration and Rate of Flow on the Efficiency of Percolation William J Husa and C L Huyck
- Drug Extraction IX The Efficiency of Repercolation for Belladonna Root and Nux Vomica " William J Husa and C L Huyck
- 'The Influence of Certain Salts on Morphine Toxicity and Narcosis in Mice and Rats ' J M Ort and W G Christiansen
- A New Type of Hypnotic Amide *N* (*beta keto propyl*) Diethyl Acetamide," W A Lott and W G Christiansen
- Preparation of Benzoyl Persulphide " E Moness, W A Lott F F Berg and W G Christiansen
- The Percolation of Cinchona " J L Powers and Edward Kremers
- Bioassays of Rodenticides," J C Munch, F E Garlough and J C Ward
- Thallum XIII Symptoms and Systemic Action on Cattle " J C Ward
- Constituents of Ma fang chi " A Ling Chen and K K Chen (Presented by title)
- 'The Cat Units of 7 Crystalline Cardiac Principles from Plants," K K Chen, A Ling Chen and Robert C Anderson (Presented by title)
- Harmine from Caapi " A Ling Chen and K K Chen (Presented by title)

- "A Study of Several Species of the Genus Monarda," B V Christensen, and R S Justice (Presented by title)
- 'A Histology of Cracca Virginiana Linne Root," B V Christensen and Elbert Voss (Presented by title)
- 'Monarda pectinata, Nutt , A Phytochemical Study," Joseph B Burt and Edward Kremers (Presented by title)
- 'Thiobarbiturates III Comparison of Sulphur and Oxygen Analogues," Ellis Miller, James C Munch and Frank S Crossley (Presented by title)
- "Enzymatic Action in the Presence of Some Common Antiseptics " O E Rumble and R J Hartman
- 18 Reports of Committees
- 19 Nomination of Officers
- 20 New Business
- 21 Unfinished Business
- 22 Election and Installation of Officers
- 23 Adjournment

SECTION ON PRACTICAL PHARMACY AND DISPENSING

(PHARMACOPŒGIAS, FORMULARIES AND STANDARDS)

OFFICERS

Chairman H M Burlage, *First Vice Chairman* L W Rising *Second Vice-Chairman*, Frank L Black *Secretary*, Leon W Richards, *Delegate to the House of Delegates* R W Clark

First Session, Thursday, 9 00 A M —Grand Ball Room
Program

- 1 Chairman's Address H M Burlage
 - 2 Secretary's Report Leon W Richards
 - 3 Report of the Committee on Prescription Tolerances for 1934-1935, H H Schaefer
 - 4 Appointment of Committees
 - 5 Papers
- "New Standards for Medicinal Carbon in U S P XI," Joseph Rosin, Geo D Beal and Chester R Szalkowski
- Foresight in Professional Pharmacy," Ernest T Stuhr
- "Dentistry and Pharmacy as Cognate Professions " Raymond P LeRoy
- 'Is Extemporaneous Pharmacy a Moribund Art? ' Wm F Reindollar
- 'Back to Pharmacy " Roy A Perry
- 'Manufacturing and Marketing Toilet Products from Your Own Laboratory," Alex F Peterson, Jr

- 'New Products and the Problems They Present," Ronald V Robertson
- 'The Stabilization of Milk of Magnesia by Citric Acid," E C Billheimer, F F Berg and F W Nitardy
- Comparison of Spectrometric and Antimony Trichloride Methods for the Estimation of the Vitamin A Potency of Fish Liver Oils," W S Jones, F F Berg and W G Christiansen
- Study on Washing of Milk of Magnesia through a Permeable Membrane," E Moness, W A Lott, F F Berg and W G Christiansen
- "A Service That Built a Prescription Business," L D Bracken
- "The Need of Greater Care in the Dispensing of Potent Medicinal Substances in the Form of Sugar Coated Pills in Confections," John F Suchy
- Problems of Retailing," Roy A Perry
- "The Hospital Pharmacist Work in Southern California," P W Howard
- "The Hospital and the Pharmacist Some Observations in Establishing a Department of Pharmacy," H C McAllister
- "A Plan for Pharmacy Internships at the University of Michigan Hospitals," Harvey A K Whitney¹ and E C Watts
- "Practical Pharmacy Problems," Carl Gibson
- 'The Physician and the Pharmacist," Ralph W Clark
- 'Ointments" Ralph W Clark

Second Session, Friday, 2 00 P M —Grand Ball Room

- 'The Preparation of the Resin of Podophyllum" Arthur H Uhl
- "Hydrophile Petrolatum," Bernard Tantis and Hattie Dymewicz
- 'Improvement in Technique in the Preparation of Three Common Products" Edward D Davy
- "Tincture of Opium—Process to Reduce Precipitation," P L Burrin and F E Bibbins
- "Studies on Three U S P and N F Preparations by Shortened Procedures" Henry M Burlage with W J Smith
- Suggested Changes in Three Official Preparations," C L Cox
- 'Modernized Progress of Pharmacy in the

- Realms of Dispensing," C George Hamilton
- "Errors in Methods Used for Testing Enteric Coatings," F S Bukey and C W Bliven
- The Percentage Preparation" Ralph Bienfang
- 'A Table of Equivalents," Ralph Bienfang
- 'Percentage Solutions" Earl Gunther
- It Can Be Done Difficult Preparations Series No IV," J Leon Lascoff
- 'Pharmaceutical and Chemical Incompatibilities," Geo L Secord
- 'Prescription Problems," Thomas G Wright
- Dropper for Tincture Digitals," R A Konnerth, R E Schoetzow and F F Berg
- Assay of Liniment of Camphor," D A Overby R E Schoetzow and F F Berg

Joint Session with the Scientific Session, Thursday, August 8th, 8 00 P M —Assembly Hall

(See order under Scientific Section)

- 6 Report on U S Pharmacopœia, E Fullerton Cook (20 minutes)
 - 7 Report on National Formulary, E N Gathercoal (15 minutes)
 - 8 Report of Recipe Book, J Leon Lascoff (10 minutes)
 - 9 Report of Committee on Glass Standardization, H V Army (10 minutes)
 - 10 Report of Committee on Ebert Prize, G L Jenkins
 - 11 Report of Committee on Unofficial Standards John C Krantz Jr
 - 12 Report of Committee on Collection of Information Pertaining to Professional Pharmacy, Marvin J Andrews
 - 13 Report of Committee on Prescription Tolerances
 - 14 Papers
- Daphnia—the Living Reagent" (with Motion Picture) Arno Viehoever
- "Biochemistry of Podophyllum Peltatum" Arno Viehoever and Harry Mack
- 'Differentiating Characteristics of Glycyrrhiza Plants," Arno Viehoever

SECTION ON EDUCATION AND LEGISLATION

OFFICERS

Chairman Oscar E Russell, Vice Chairman Charles W Ballard, Secretary L W Rising,

¹ Chief Pharmacist
Assistant Chief Pharmacist

Delegate to the House of Delegates, George C Schicks

**First Session, Wednesday, August 7th, 2 00
P M —Colonial Room**

- 1 Chairman's Address, Oscar E Russell
- 2 Secretary's Report, L Wait Rising
- 3 Report of the National Dental Committee, G C Schicks
- 4 Report of the Committee on Cooperation with Hospital Pharmacists R W Rodman
- 5 General Business (Committee appointments, etc)
- 6 Papers
 - 'Things to Be Considered in the Promotion of Official Products Marvin J Andrews
 - 'What Price Prescriptions?' F C Felter
 - 'Your Opportunity for Publicity,' Howard Stephenson
 - 'Development of Pharmaceutical Education and Legislation in Georgia " A discussion Robert C Wilson
 - 'Entangling Alliances," Wortley F Rudd
 - 'The Changing Attitude of Government toward Professional Pharmacy," Arthur D Baker
 - 'Students, Deans Druggists and Legislators," E J Parr
 - "Undergraduate Research " Lawrence H Baldinger
 - 'Substitution an Unnecessary Evil " J Norman Salsby
 - 'A Limited Enrollment Selective Plan," A Richard Bliss Jr

**Second Session, Friday, August 9th, 9 00 A M
—Assembly Hall**

- 'Problems in Pharmaceutical Education," H B Carey
- Presentation of Basic Sciences in Colleges of Pharmacy," T C Daniels
- Questions Testing the Recognitive Faculties of Students," J H Goodness
- 'The Fate of the Pharmacist under State or Socialized Medicine," J H Kidder
- Fair Trade Legislation," Frank A Mortenson
- 'Why Pharmacy Legislation Fails," Hugh P Berne
- "The Pharmacist and the Pediatricist " W F Ambroz
- 'National Unity of State Cooperation between Pharmacists and Physicians " G C Schicks
- 'Pharmacy Legislation in Mississippi ' Lew Wallace.

"Discussion of Education and Legislation," W Mac Childs

- 'A Practical Method of Increasing the Prestige of Pharmacy as a Profession," L Wait Rising
- 7 Unfinished Business
- 8 Report of Committee
- 9 Election and Installation of Officers
- 10 Adjournment

**SECTION ON COMMERCIAL
INTERESTS**

OFFICERS

Chairman, Henry Brown, Vice Chairman, Robert W Rodman, Secretary, R T Lakey, Delegate to the House of Delegates John A J Funk

**First Session, Wednesday, August 7th, 2 00
P M —Marine Room**

- 1 Chairman's Address, Henry Brown
- 2 Report of Secretary, R T Lakey
- 3 Appointment of Committees
- 4 Papers
 - The Pharmacist Studies Law," Charles G Ajax
 - How to Help the Pharmacist Commercially,' Eugene C Brokmeyer
 - A Study of the Commercial Pharmacy Curriculum," Neal Bowman
 - 'What Determines Net Profit?' C Leonard O Connell
 - 'The Fair Trade Acts and Their Effects," Paul C Olsen
 - 'The Selling Price of Prescriptions " Frank A Delgado
 - 'The Open-View Prescription Department," Frank A Delgado
 - 'Merchandising Your Profession " Ralph A Beegle
 - 'The Need of Commercial Training in Colleges of Pharmacy," Ralph A Beegle
 - "Dogs Cats Birds and Babies," Alice-Esther Garvin

**Second Session, Thursday, August 8th, 2 00
P M —Marine Room.**

- 'The Futility of Cutting Prices and a Comparative Price Survey of Two States—One with a Price Maintenance Act," George M Archambault
- The California Fair Trade Act " Ira Darling (University of California)
- 'A Scientific Study of the Merchandising Value of Windows " F A Geue
- 'A Comparison of the Ratios of Wisconsin

Drug Stores at the Time the State Pharmacy Law Was Passed and at Present," Minnie Myers and Edward Kremers

Vaccines and Serum Products of the U S P XI," Clarence M Brown

'Questions Testing the Recognitive Faculties of Students," Joseph H Goodness

5 Unfinished Business

6 Report of Committees

7 Election and Installation of Officers

8 Adjournment

SECTION ON HISTORICAL PHARMACY

OFFICERS

Chairman, C O Lee, *Secretary*, H W Youngken, *Historian*, Eugene G Eberle

SESSIONS WEDNESDAY, AUGUST 7 2 00 P M AND

THURSDAY, AUGUST 8, 9 00 A M

Program

Wednesday, 2 00 P M , First Session—Rose Room

1 Address by the Chairman

2 Report of the Historian

3 Report of the Secretary

4 Papers—Subject to rearrangement

A Brief History of the Drug Code,' E F Kelly

'Pharmacy and a Commemorative Stamp " Illustrated by Lantern Slides, F A Delgado

'The First Pharmacist in North America," Theodore J Bradley

'William Withering and the Introduction of Digitalis into Medical Practice," Louis A Roddis

'Moses Maimonides, Physician and Author of Medical Works," Louis Gershenfeld
David Henshaw—from Druggist to Secretary of the Navy," George E Ewe

'John Marsh, a Medico Pharmaceutical Practitioner on Six Frontiers," Edward Kremers

'Early Drug Stores in Oklahoma," Loyd E Harris

The Pharmacopœia of 1880," L M Parks

'The Massachusetts Pharmacopœia of 1808," Edward H Niles

'The Californian Indians, Their Medical Practices and Their Drugs " John Culley

'Estonian Pharmacy," Rudolph Wallner ¹

5 Appointment of Nominating Committee

Thursday, August 8th, 9 00 A M , Second Session—Rose Room

State Association Secretaries, arranged in order of service, J G Beard

Medical Practices of the New England Indians," Will T Bradley

Pioneers of Pharmaceutical Education in the United States ' Ernst T Stuhr

"A History of Dentifrices" Martha E Faulk

Apothecary Shops of Colonial Times," Millicent R LaWall

Medicine Making as Depicted by Museum Dioramas," Charles Whitebread

'Honoring Age and Service " John E Kramer

Report of the Pharmacy Exhibit for 1933 and 1934," H C Christensen

Drugs of the Bible," A R Bliss Jr

The Ancient Medicinal Uses of Gums and Precious Stones " A R Bliss, Jr

History of the Dorfinger Druggists Show Globes," R W Rodman

The Pharmaceutical Museum at the University of Minnesota," F J Wulling

Mandragora," W H Blome

Other papers to be announced

6 Report of Nominating Committee

7 Election and Installation of Officers

8 Adjournment

CONFERENCE OF PHARMACEUTICAL ASSOCIATION SECRETARIES

OFFICERS

President F V McCullough *First Vice President* J W Slocum, *Second Vice President* Roy C Reese *Secretary Treasurer*, Carl G A Harring, *Delegate to the House of Delegates*, C J Clayton, *Members of the Executive Committee*, J Lester Hayman J J Gill, Roy Reese ¹ W E Bingham ¹

The President will announce further items and changes

SESSIONS

First Session Wednesday August 7th, 2 00 P M , Joint Session, Section on Education and Legislation Conference of Pharmaceutical Law Enforcement Officials, Thursday, August 8th 8 00 P M , Second Session Conference of Pharmaceutical Association Secretaries 9 00 A M

¹ Retail Estonian pharmacist

¹ Deceased

First Session, Wednesday, August 7th, 2 00 P M —Club Room

- 1 Call to Order
- 2 Remarks of Chairman F V McCullough
- 3 Report of Secretary, Carl G A Harring
- 4 Calling of Roll by Secretary
- 5 Report of Committee on Constitution and By Laws
- 6 Address, "The N A R D Washington Bulletin to Association Secretaries" Rowland Jones

The Conference of Pharmaceutical Association Secretaries will try the plan of having no papers read but, instead devote the sessions to round table discussions of timely topics. A list of topics follows, which may be added to

TOPICS

The Progress in Affiliation of Associations Representing Organized Pharmacy," and a review of the findings of the joint committee representing the N A R D A Ph A and State Secretaries at the Washington Conference

Joint Session with Section on Education and Legislation and Conference of Pharmaceutical Law Enforcement Officials, Thursday, August 8th, 8 00 P M —Junior Ball Room

Topics for Discussion to be provided
Reports on enacted and proposed legislation in various states

Second Session, Friday, August 9th, 9 00 A M —Club Room

The Secretary's Obligation to the Industry in Promoting Sound Business and Fair Trade Practices " Discussion led by J W Slocum

The Secretary's Obligation to the Profession in Promoting the Professional Phase of the Practice of Pharmacy ' Discussion led by R C Wilson

' The Secretary's Obligation to the Industry and Profession in Sponsoring State and National Legislation " Discussion led by Roy S Warnack

- 7 New Business
- 8 Election of Officers

CONFERENCE OF PHARMACEUTICAL ASSOCIATION LAW ENFORCEMENT OFFICIALS

The chairman will announce additions and changes

OFFICERS

Chairman R L Swain, Secretary M N

Ford, *Delegate to the House of Delegates*, Fred Schaefer

SESSIONS

First Session, Thursday August 8th 9 00 A M Thursday August 8th, 8 00 P M, Joint Session, Section on Education and Legislation and Conference of Pharmaceutical Association Secretaries Second Session Friday, August 9th, 9 00 A M

Program

(Changes may be made if deemed necessary and expedient)

First Session, Thursday, August 8th, 9 00 A M —Club Room

- 1 Call to Order
- 2 Remarks by Chairman Robert L Swain
- 3 Report of Secretary M N Ford
- 4 Report of Finance Committee
- 5 Pharmacy Law Enforcement in Washington Oregon and Idaho Harry C Huse Director of Licenses Washington, Linne E Jones Secretary, Oregon Board of Pharmacy Frank L Christenson, President Idaho Board of Pharmacy
- 6 Report of New Legislation Affecting the Control of Pharmacies, Pharmacists and the Manufacture and Distribution of Drugs and Medicines

Robert P Fischelis, New Jersey
George W Mather, New York
Robert L Swain Maryland
W Mac Childs Kansas
P H Costello South Dakota
Edna E Gleason California
R C Shultz Wyoming
J A Riedel Montana
R W Fleming Nevada
A L I Winne Virginia
Roy B Cook, West Virginia

- 7 Round Table Discussion
Is It Advisable to Give Boards of Pharmacy Authority to Limit the Number of Students Entering Courses in Pharmacy?
Should Boards of Pharmacy be Empowered to Regulate the Number of Drug Stores, and, if So, What Shall Be the Basis of Such Regulation?
What Can Be Done to Further Restrict to Pharmacists the Distribution of Potent Drugs and Medicines and Medicines in General?
Have the Barbituric Acid Laws" Worked Out Satisfactorily?

Should Law Enforcement Officials Attempt Some Program Looking to Supervised Experience?

What Enforcement Difficulties Have Been Met with under the Uniform State Narcotic Act?

The Requirements for Drug Store Permits

- 1 U S P and N F
- 2 Apparatus and Equipment
- 3 Sanitation
- 4 Personnel
- 5 Etc

Joint Session with Section on Education and Legislation and Conference of Pharmaceutical Association Secretaries, Thursday, August 8th, 8 00 P M—Junior Ball Room

- 8 Election and Installation of Officers
- 9 Unfinished Business
- 10 Adjournment

STATE PHARMACEUTICAL ASSOCIATION OFFICERS

ALABAMA

N G Hubbard, former president of the Birmingham Association of Retail Druggists, was advanced to the presidency of the Alabama Pharmaceutical Association. Other officers for the ensuing year are *First Vice-President*, Sam Watkins, Dora, *Second Vice President*, E M Megginson, Mobile, *Treasurer*, W H Ward, Tuscaloosa, *Secretary*, Z C Lewis, Montgomery

ARKANSAS

Lew Wallace, of the Mississippi Pharmaceutical Association, addressed the Arkansas Association on the subject "Mississippi's program on U S P and N F Propaganda." The resolutions committee's report was received with enthusiasm, also that on the outstanding endorsement of Herbert Parker for governor of Arkansas. Officers elected and installed include *President*, J E Berry, Smackover, *Vice-Presidents*, Charles Dana Gibson, Hope, and Guy Elkins, Booneville, *Treasurer*, Troy Churchman, North Little Rock, *Secretary-Manager*, Irl Brite, Little Rock, *Sergeant at Arms*, W R Griffin, Heber Springs, *Place of Meeting*, Little Rock, *Time*, 1936

CALIFORNIA

The following officers were elected for the ensuing year by California Pharmaceutical Association. *President*, Wm Rutherford, Santa Rosa, *First Vice-President*, Charles R

Seward, Pasadena, *Second Vice-President*, Louis Fischl, Berkeley, *Third Vice President*, T D Perkins, San Diego, *Treasurer*, John G Wagner, Long Beach, *Executive Secretary*, Roy S Warnack, Los Angeles

Assembly Bill 1870—the fair trade practice act, and Assembly Bill 2365—the chain store tax bill are most important bills so far as individual merchants and fairness in merchandising are concerned. Senate Bill 229 amends the State Narcotic Act. The most important change is as follows: "Within 24 hours after any purchaser in this state gives an order to, or makes any contract or agreement for purchases from or sales by, an out of state wholesaler or manufacturer of any narcotic drugs specified in Section 1 of this act for delivery in this State, such purchaser shall forward to the State Division of Narcotic Enforcement by registered mail, a true and correct copy of the order, contract or agreement."

COLORADO

The officers elected for the ensuing year are *President*, Paul G Stodghill, Denver, *First Vice-President* Clyde C Phillips, Jr., Colorado Springs, *Second Vice-President*, H Rodney Anderson Montrose, *Treasurer*, V N Lagerquist, La Junta, *Secretary*, Chas J Clayton, Denver

INDIANA

A session of Indiana Pharmaceutical Association was given over to the "Keeping Up of the Profession." Another to the theme "Keeping Profits Up." The subjects were "Club Selling," "Profitable Store Arrangement and Displays," "Profitable Advertising and Small Town Druggists."

Officers elected for the year are *President*, H W Miller, *Vice Presidents*, G D Revington, R E Thornburg and Charles E Reed, Herbert H Gerding and Retiring *President* E N Harper are new *Executive Committeemen*. *Secretary* F V McCullough and *Treasurer* Harry J Borst were re elected.

MARYLAND

District of Columbia pharmacists joined members of the Maryland Pharmaceutical Association in the annual convention. Much attention was given to the Fair Trade Act, R L Swain gave an analysis of this important legislation and others added to his remarks. Among speakers on this and other subjects were W Bruce Philip, E F Kelly, A G DuMez and others.

Marvin J Andrews reported on tolerances in prescription practice, A H Bryan presented a paper on antiseptic action of ointments and face creams, J Leon Lascoff explained "how it could be done" in the presentation of another paper to the helpful series begun several years ago

The program was made up of interesting studies and well and favorably known speakers, among others, besides those mentioned were Dean W Paul Briggs, Rowland Jones Marvin R Thompson

The Governor of Maryland and the Mayor of Baltimore were named on the program as banquet speakers Hugh Craig, of the *Oil Paint and Drug Reporter*, chose as his subject "The Need for Economic Harmonies"

The associations heard the discussions of subjects of timely importance by two presidents who had given time and study to conditions affecting pharmacy and the drug business President Andrew F Ludwig delivered his address the second day of the convention and President A C Taylor on the following day

The officers chosen for the ensuing year are *President*, H W Matheney, Cumberland *Vice Presidents* Melville Strassburger, Baltimore, and H A M Dewing, Centerville, *Secretary*, E F Kelly, *Treasurer*, Harry S Harrison, *Members of Executive Committee*, C C Neal, W B Spire L V Johnson Andrew F Ludwig, Aquilla Jackson John Wannan wetsch, *Editor*, *Maryland Pharmacist*, R L Swain Alfred E Pearre Frederick, *Honorary President*

MICHIGAN

The new officers of the Michigan Association are *President* Benjamin Peck of Kalamazoo, *First Vice-President*, Joseph Maltas of Sault Ste Marie *Second Vice-President* James Lyons Detroit, *Secretary*, Clare Allan Wyandotte, *Treasurer*, Henry Hadley of Benton Harbor Ray Jensen of Grand Rapids and Peter McFarlane of Lansing are members of the *Executive Committee*

MISSISSIPPI

Mississippi adopted a resolution urging abolition of the state sales tax The following officers were elected *President* J S Puller, Starkville, *First Vice President* W J Cox, Nettleton, *Secretary-Treasurer*, S B Key, Jackson, *Executive Committeemen* are H B McInnis Lumberton, G C Roberts Greenwood, and Lew Wallace Laurel

NEW HAMPSHIRE

The following officers were elected *President*, George A Moulton Peterborough, *Vice-Presidents*, Lawrence E Cate, Rochester, and Frank J Kelly, Concord, *Secretary*, Rodney A Griffin, Franklin, *Treasurer*, A E Gosselin, Manchester, *Auditor*, Herbert E Rice, Nashua

NORTH DAKOTA

The following were elected at the Golden Anniversary meeting of North Dakota Pharmaceutical Association *President*, H Saunders, Minot Mr Saunders succeeds Lloyd G Beardsley of New Rockford, who becomes a member of the executive committee Other officers are *First Vice-President*, Andrew E Erickson Fargo, *Second Vice-President*, Philip Boise, Dickinson, W F Sudro, Fargo was reelected *Secretary*, and P H Costello, Cooperstown reelected *Treasurer*

The history of the association from its incorporation December 15, 1886, under Dakota territory laws to the present time was traced by W P Porterfield of Fargo at the dinner meeting of the Veteran's association

VERMONT

Officers of Vermont Pharmaceutical Association elected for the ensuing year are *President*, George T Donovan, Fair Haven, *Vice-Presidents*, Joseph W Blakely, Montpelier, F W Wheeler Springfield, Albert E Cox, Hardwick, *Secretary* and *Treasurer*, L C Chickering, Brattleboro

WISCONSIN

Wisconsin Pharmaceutical Association elected the following officers *President* John L Huber, Racine, *Vice-Presidents*, Arthur Broenen South Milwaukee, Carl Hendricks, Superior, M C Whitrock Wisconsin Rapids, *Secretary*, Jennings Murphy, South Milwaukee, *Treasurer*, Bruno F Liedel, Milwaukee S H Dretzla, retiring president, was elected *Delegate* to the A Ph A meeting

Speaking on the work of the Interprofessional Relationship Committee Ralph W Clark suggested that dentists be added to the list of professional men getting prescription suggestions from the druggists

LOUISIANA PHARMACY BUILDING

Louisiana State University has applied to the Public Works Administration for a grant of \$1,035,000 00 toward construction of a new 14-

story pharmacy and medical building. The cost of the entire project was fixed at \$2,292,-456 00. The application was made by Dr James M. Smith, president of the University, as part of the extension to the medical center to provide housing and facilities for schools of pharmacy, dentistry and graduate school of medicine, and additional facilities for the present school of medicine.

(To be continued)

BRITISH PHARMACEUTICAL CONFERENCE

LIST OF SCIENCE PAPERS

The following papers have been received for communication to the Belfast meeting of the British Pharmaceutical Conference, and will be read at the Science Sessions, June 25th and 26th: "Thyroid Standardization and Dosage," R. F. Corran, J. Pritchard and F. E. Rymill.

"The Effects of Hot Solvents on Ergot, with a Note on the Effects of Storage on the Activity of Ergot," R. F. Corran and F. E. Rymill. "The Estimation of the Mercury Content of Mercurochrome," R. F. Corran and F. E. Rymill.

"The Determination of Ferrous Iron in Presence of Organic Matter by Heisig's Method," G. J. W. Ferrey.

"Observations on the Preparation and Properties of Iodoform and Thymol Iodide," Norman Glass.

"The Preparation of Sterile Solution—II," H. Davis.

"The Assay of Glyceryl Trinitrate Tablets," Wilfred Smith. "Glyceryl Trinitrate Tablets," H. O. Meek. "Percolation of Cinchona and Belladonna, the Rate of Alkaloid Extraction and Effect of Degree of Comminution," A. W. Bull.

"A Note on Isopropyl Nitrite," C. L. M. Brown.

"The Glycols (with special reference to Propylene Glycol)," C. L. M. Brown.

"The Melting Point of Chloral Formamide," C. T. Bennett and N. R. Campbell.

"Alcohol Content and Specific Gravities of Tinctures of the British Pharmaceutical Codex," 1934, C. T. Bennett and F. C. L. Bateman.

"The Use of Rabbits in the Assay of Digitalis, Strophanthus and Squill," G. N. Rapson and S. W. F. Underhill.

"The Oestrogenic Activity of the Urine of Cows during Pregnancy," M. M. O. Barrie, J. B. E. Patterson and S. W. F. Underhill.

"The Deterioration of Atropine Eye Ointments on Storage," Noel L. Allport, A. I. C.

"An Improved Method for the Estimation of the Essential Oil Content of Drugs," T. Tusting Cocking and G. Middleton.

"The Relative Merits of Maceration and Percolation for the Preparation of Tincture of Digitalis," H. Berry and H. Davis.

"A Note on the Spectrographic Absorption of Ergometrine in Relation to the Maurice Smith Colour Test," Noel L. Allport and S. K. Crews.

"The Determination of Lead in Its Official Compounds and Preparations," S. Wetherell.

"The Stability of Aqueous Solution of Ouabain and K. Strophanthus," H. Berry.

"The Analysis of Some Complex B. P. C. Ointments," D. C. Garratt. "Estimation of the Extractives of Capsicum," H. Berry.

THE MEDICAL ASSOCIATION MEETING AT ATLANTIC CITY

Liberty is taken in quoting from *Merc's Report* on the program of the Scientific Assembly of the American Medical Association. Looming large are the possibilities of vitamin and endocrine therapy, forecasting possible revolutionary changes in the treatment of many diseases. Studies on Crystalline Vitamin B₁, Experimental and Clinical Observations by Drs. Martin G. Vorhaus, Robert R. Williams and Robert E. Waterman, New York, was a paper representative in the vitamin field. Among those enlisting interest in the field of endocrinology were the papers on The Antihormone Theory in Relation to Anterior Pituitary Physiology by Dr. James B. Collip, Montreal, Que., "Recent Advances in Knowledge of the Relationship of the Pituitary to Ovarian Hormones" by Dr. David P. Barr, St. Louis, "Thyroxine and the Hormone Elaborated by the Adrenal Cortex" by Dr. E. C. Kendall, Rochester, Minn., "Experimental Studies on Replacement Therapy in Adrenal Insufficiency," by Drs. Arthur Grollman and W. M. Firor, Baltimore, "Comparative Effects of Pressor and Oxytocic Fractions of Posterior Pituitary Extract on Blood Pressure and Intestinal Activity" by Dr. Kenneth I. Melville, Montreal, Que. The Biologic Effects following the Continuous Administration of Pineal Extract to Successive Genera-

tions," by Drs Leonard G Rowntree and J H Clark, Philadelphia, and A M Hanson, Faribault, Minn, and 'The Pharmacology of Testicular Hormones," by Dr D Roy McCullagh, Cleveland This last paper is of interest in that the possible treatment of prostatic hypertrophy appears to be foreshadowed, following the suspicion of the author of the presence of a second testicular hormone called 'Inhibin"

The paper by Fred E Angle, entitled Treatment of Acute and Chronic Brucellosis (Undulant Fever)" emphasizes the specificity of undulant fever vaccine therapy, with special reference to its preparation, the selection of strains, dosage, method of administration, reactions and contraindications for its use

The Scientific Exhibit was outstanding Here again vitamins and endocrinology played an important role Drs Irving S Wright A W Duryee and co workers also showed the spectacular results obtained in their first nine cases of chronic leg ulcer treated with Mecholyl iontophoresis All of these cases were of long duration, had failed to heal with other therapy, and were discharged as cured with complete healing The National Formulary Exhibit was reported on in the June issue of the JOURNAL A PH A, page 520

VIRGINIA PHARMACEUTICAL ASSOCIATION

The 54th annual convention of the Virginia Pharmaceutical Association was held at Virginia Beach, June 17th to 19th The measure which received most attention was a Fair Trade Bill similar to the California Law The Association went on record disapproving the requesting of medicine from manufacturers for distribution at District meetings

A resolution was adopted to amend the existing pharmacy law The business must be operated under the direct supervision of a registered pharmacist and an assistant pharmacist may temporarily act in his place

ILLINOIS PASSES FAIR TRADE ACT

The Illinois House passed without opposition the Fair Trade Act approved a few days earlier by the Senate It is expected that the bill will be signed promptly by Governor Horner

DELAWARE

Delaware Pharmaceutical Association decided that, in the event that no similar federal legislation be enacted by Congress before 1937, the Society will fight for the enactment of a

Delaware fair trade law at the 1937 session of the State Legislature Dr Robert L Swain of Baltimore, described the operation of the Maryland fair trade law Among other speakers were Thomas S Smith, Wilmington, Walter L Morgan, Wilmington, James W Wise Dover, and Albert Williams, Laurel The election of officers resulted as follows *President*, George W Brittingham, Wilmington, *Vice Presidents*, E J Elliott, Bridgeville Frank Brereton, Milford, Paul Potocki Wilmington *Secretary*, Albert Bunin Wilmington *Treasurer*, Albert Dougherty Wilmington The new board of directors consists of Thomas S Smith, Walter L Morgan and Paul Potocki, Wilmington, and Harry P Jones, Smyrna

PRESCRIPTIONS IN 1885

The *Pharmaceutical Record* in 1885, published a paper by G W Sloan former President of the AMERICAN PHARMACEUTICAL ASSOCIATION read before the Indiana Pharmaceutical Association giving an analysis of 1000 prescriptions dispensed in a store, where the formulas of a great number of physicians are dispensed Twelve leading medicines were counted and it was also ascertained in what proportion proprietary articles were ordered The following is a summary of the results Arsenic 41 bismuth 59, bromine 59 chloral 16, ergot 15 iron 128 iodine 60, mercury 60 nux vomica 130 opium 136 pepsin 42 quinine 238 Proprietary articles appear 68 times—*The Chemist and Druggist*, June 22 1935

H R 8442 and S-3154

Congressman Wright Patman and Senator Arthur R Robinson have introduced similar bills, numbered as above, which have been referred to the Committee on Judiciary in both branches of Congress The bill makes it unlawful for any person engaged in commerce to discriminate in price or terms of sale between purchasers of commodities of like grade and quality, to prohibit the payment of brokerage or commission under certain conditions, to suppress pseudo advertising allowances to provide a presumptive measure of damages in certain cases and to protect the independent merchant, the public whom he serves and the manufacturer from whom he buys, from exploitation by unfair competitors

The bill seems to have the embodiment of a measure which will give protection to the small dealer by the establishment of fair dealing

J K Lilly, *Honorary President* of the A P H A and chairman of the board of directors of Eli Lilly & Co., Indianapolis, was recently married to Mrs Lila Allison Humes

We are just advised of the death of W F Michel, editor of *The Optimist*

Governor Hoffman has appointed President

Robert P Fischelis of the AMERICAN PHARMACEUTICAL ASSOCIATION, who is Chairman of the Conference on Allied Medical Professions of the State of New Jersey, comprising the profession of Medicine, Pharmacy, Dentistry and Nursing, a member of the Committee to study the problems of unemployment insurance and of old age relief, etc

NOTICE TO CONTRIBUTORS TO THE JOURNAL AMERICAN PHARMACEUTICAL ASSOCIATION

The following notice has been prepared from comments received from members of the Board of Review of Papers and of the Publication Committee

Manuscripts should be sent to Editor E G Berle, 2215 Constitution Ave., N W, Washington, D C

All manuscripts should be typewritten in double spacing on one side of paper 8½ x 11 inches, and should be mailed in a flat package—not rolled The original (*not* carbon) copy should be sent The original drawings, not photographs of drawings should accompany the manuscript Authors should indicate on the manuscript the approximate position of text figures All drawings should be marked with the author's name and address

A condensed title running page headline, not to exceed thirty five letters, should be given on a separate sheet and placed at the beginning of each article

The method of stating the laboratory in which the work is done should be uniform and placed as a footnote at end of first page, giving Department, School or College The date when received for publication should be given

Numerals are used for figures for all definite weights, measurements, percentages, and degrees of temperature (for example 2 Kg, 1 inch, 20.5 cc, 300° C) Spell out all indefinite and approximate periods of time and other numerals which are used in a general manner (for example one hundred years ago, about two and one half hours, seven times)

Standard abbreviations should be used whenever weights and measures are given in the metric system, *e g*, 10 Kg, 2.25 cc, etc The forms to be used are cc, Kg, mg, mm, L and M

Figures should be numbered from 1 up, beginning with the text figures (line engravings are always treated as text-figures and should be designated as such) and continuing through the plates The reduction desired should be clearly indicated on the margin of the drawing All drawings should be made with India ink preferably on white tracing paper or cloth If coordinate paper is used, a blue-lined paper must be chosen Usually it is desirable to ink in the large squares so that the curves can be more easily read Lettering should be plain and large enough to reproduce well when the drawing is reduced to the width of a printed page (usually about 4 inches) Photographs intended for half tone reproduction should be securely mounted with colorless paste

"Figure" should be spelled out at the beginning of a sentence, elsewhere it is abbreviated to "Fig," per cent—2 words

The expense for a limited number of figures and plates will be borne by the JOURNAL, expense for cuts in excess of this number must be defrayed by the author

References to the literature cited should be grouped at the end of the manuscript under the *References* The citations should be numbered consecutively in the order of their appearance (their location in the text should be indicated by full sized figures included in parentheses) The sequence followed in the citations should be Author's name (with initials) name of publication volume number, page number and the date in parentheses Abbreviations for journals should conform to the style of *Chemical Abstracts*, published by the American Chemical Society

(1) Author, A Y, *Am J Physiol*, 79, 289 (1927)

Papers presented at the Sections of the AMERICAN PHARMACEUTICAL ASSOCIATION's annual meeting become the property of the ASSOCIATION and may at the discretion of the Editor be published in the JOURNAL Papers presented at these Sections may be published in other periodicals only after the release of the papers by the Board of Review of Papers of the JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

The Editor will appreciate comments from Board of Review and Committee on Publication members, authors and others interested

LUDWIG WINKLER

Ludwig Winkler, president of the Society for the History of Pharmacy since its organization, died at his home near Innsbruck July 8, 1935, aged 62 years. He was born January 12, 1873, descendent of the Apotheker family, dating pharmaceutical ancestry for more than 350 years and of the Apotheke in Innsbruck. Herein are furnishings of the 18th century and many of the old prescriptions of the pharmacy were modernized by the deceased. When Austria, in 1923, made history of pharmacy a requirement of the course Ludwig Winkler was named for the subject at the University of Innsbruck and at Innsbruck the Society for the History of Pharmacy was founded in 1926. In this work as well as in other research Dr. Winkler devoted studies, time, labor, and liberally of his means. He contributed largely to the Library of the University of Berlin, to this institution he gave photostat copies of the original manuscripts of Haydn's Opera 'Der Apotheker,'¹ no effort was too great whenever it was possible for him to aid in the study of pharmaceutical history and this applies particularly to his contributions to the Society for the History of Pharmacy.



LUDWIG WINKLER

Dr. Alexander Tschurch in a greeting on the sixtieth birthday of Ludwig Winkler said that pharmacy would ever be grateful for the work in connection with the Society. Seldom has a thought taken root with such rich results. In this connection as a memorial to the pharmacist and historian Ludwig's memory should be commemorated in the American Institute of Pharmacy. His home university created him an honor citizen and he received the gold honor ring of the German Museum at Munich.

On account of health conditions he did not attend the later meetings of the Society, the Apotheke which he had conducted with honor to himself, his antecedents and pharmacy was passed into the hands of his oldest son in 1933.

The *Pharmazeutische Zeitung* closes a sketch with words expressive of that "what Ludwig Winkler received from his ancestors he deepened, clarified and enriched for those who follow. A worker died, his works live on." Quoting the original—"Was er von den Ahnen empfang, hat er vertieft, geklärt und bereichert an die Nachwelt weitergegeben. Ein Wirkender starb, das Werk bleibt lebendig."

¹ "Der Apotheker" was produced in 1768. "The Doctor and the Apothecary" was written in 1762 by Haydn's friend, Dittersdorf, who gave the former violin lessons. Some of Haydn's works were burned when Prince Esterhazy's private theater was destroyed by fire in 1779.



H A ESTABROOK

JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

VOL XXIV

AUGUST, 1935

No 8

HENRY A ESTABROOK

Henry Arthur Estabrook is concluding his 50th year of membership in the AMERICAN PHARMACEUTICAL ASSOCIATION. He was born in Ashby, Mass., April 22, 1850, and the 85th anniversary of his birth was made the occasion of a celebration by the members of the Massachusetts House of Representatives of which he has been a member for 12 years. Addresses and presentations were made and the veteran responded in a happy vein. He is House Chairman of the committee on education.

The subject of this brief sketch comes of Revolutionary stock—his father was a direct descendant of Rev. Joseph Estabrook, known in prerevolutionary times as the sage of Concord, his mother was a direct descendant of James Hayward, one of the three Colonials killed at Concord by "the shots heard around the world."

Mr. Estabrook came to Fitchburg from Salem in 1881 and purchased the Derby drug store and continued in the business until 1921 when it was incorporated under the name of Estabrook-Green Co., Inc., of which he was president until he joined the pharmaceutical staff of Brooks Pharmacy, Inc.; later, he established a surgical appliance business.

Mr. Estabrook was a member of the first state board of pharmacy of Massachusetts and he is an honorary member of the New England Board of Registration. He has been a trustee and director of Massachusetts College of Pharmacy for many years and has been honored by that institution with a pharmacy degree, and he has always taken a deep interest in local and state pharmaceutical associations.

Our veteran member takes an active part in church and civic affairs, for several years he was parish clerk and treasurer, and director of the Y. M. C. A., Fitchburg, and holds membership in Masonic and other fraternal organizations. He was a member of the School Committee of the city for many years, a director of the Merchants Association and the Board of Trade, a trustee of the Worcester North Savings Institution, of the Fitchburg Rifle and Gun Club, Massachusetts Fish and Game Protective Association, of which he was elected an honorary life member.

EDITORIAL

E G EBERLE EDITOR

2215 Constitution Ave., WASHINGTON D C

THE PORTLAND MEETING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

THE 83rd annual meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION has become part of its history. The attendance was larger than anticipated by those who had given consideration to the prospects, fearful that distance from more central points would prevent many from going to the convention this year. The hosts were enthusiastic in their appreciation of the selection for the 1935 meeting expressed by a very interesting and enjoyable program. The hospitalities of Oregon and sister states made the visitors aware of the genuineness and sincerity of the welcome accorded them.

The Local Secretary and the co-workers entered early into the determination to make a success of the Portland meeting and the spirit resulted in arrangements which marked the annual event and the convention programs. There was evident a leadership and a desire that the workers of the ASSOCIATION and the related organizations should realize that the hosts had service as an outstanding purpose and were delighted to entertain the visitors. In this they eminently succeeded and only words of praise were heard, the press published excellent reports of the meeting and the hotel made the visitors feel at home, the meeting rooms were all on one floor, so that members had no difficulty in locating the sessions and, when necessary, to expeditiously render their reports at the meetings of the several sections and conferences.

The Tri-State meeting of the Associations of Oregon, Washington and Idaho held on Monday and Tuesday was an unusual feature and added greatly to the attendance and interest. This joint meeting brought the pharmacists of the Pacific Northwest into closer touch with the A P H A and set a precedent which might well be followed in many sections.

At this late day it is impossible to detail the transactions, and members are referred to the addresses of presiding officers, sessions of the Council and report of the Committee on Resolutions, which, it is hoped, can be included in this number of the JOURNAL. The addresses speak for the activities of the respective bodies and the reports of part of the transactions. The conclusions reached on some of the important matters and other details will have to be deferred to succeeding issues, when the minutes of the General Sessions, House of Delegates, Sections of the ASSOCIATION and related bodies are printed. A general statement will apply that this meeting was eminently successful, and there was evident a desire to coordinate and cooperate to the end that pharmacy may progress, and that those engaged may look to leadership and direction from the associations charged with duties to improve conditions by sane and fair methods of business and professional conduct. Progressive steps have been taken and it may be said that the meetings of the state associations were mutually helpful, the outcome of some of these discussions will find further expression by national and state associations.

The award of the Ebert Prize to Marvin J. Andrews shows that the careful studies in prescription practice have awakened thought relative to the great im-

portance of this service The founder of the Prize, Albert E Ebert, was a practicing pharmacist during his life

Certificates of appreciation were awarded to Chairman H C Christensen of the Committee on Pharmacy Exhibit at the Chicago Century of Progress and to his co-workers in this splendid effort to emphasize to the people the public-health service of pharmacy

The report of the Special Committee on the Council on Pharmaceutical Practice presented in the General Sessions and the discussion of Prescription Department Economics, bearing on the revision of Professional Pharmacy, the Symposium on Prescription Pricing, the address on "The Practical Value to Pharmacists of the Activities of the Council on Pharmacy and Chemistry, and the Address on Dentistry and Pharmacy," bear evidence of the absorbing thoughts to advance pharmacy and coordinate public health professions

The address of President Fischelis presented the deep interest of the ASSOCIATION in supplying proper standards, a purpose which led to the establishment of the ASSOCIATION The United States Pharmacopœia and the Federal Food and Drugs Act was the subject of a thoughtful address by James H Beal as part of the program of a General Session

The Report of the Committee on Maintenance speaks for the untiring and successful efforts of Chairman H A B Dunning which have been largely instrumental in providing for American pharmacy a building in which pharmacists may well have pride and hope for it a growing usefulness His work, with the support of every division of pharmacy, has brought distinction and further possibilities to pharmacy

Dr D M R Culbreth, Baltimore, member since 1883, was elected honorary president and Dr C A Rojahn, Halle, Germany, editor of the German Year Book of Pharmacy, was elected an honorary member of the ASSOCIATION

The House of Delegates held representative sessions, the reports showed the cooperative value afforded by and for the constituents, the activities are in the interest affecting all divisions of pharmacy as shown by its program The sections considered many papers in line with present-day thought The revisions of the United States Pharmacopœia, the National Formulary and the Recipe Book marked quite a number of the contributions to the Scientific Section, the Section on Practical Pharmacy and Dispensing and the Section on Education and Legislation

The Section on Historical Pharmacy considered many interesting papers—a number dealt with Indian materia medica, a valuable report concerned the Badianus Manuscript, an Aztec herbal, being the earliest known herbal published in the New World It was written in Aztec by one Indian and translated into Latin by another in 1552, both were educated in a college in Mexico City Of general interest, the paper on "Pharmacy and a Commemorative Stamp" was presented by F A Delgado, and illustrated by slides—The proposal is to have the Post Office Department provide a stamp commemorating the completion of the American Institute of Pharmacy

The Conference of Pharmaceutical Association Secretaries and the Conference of Pharmaceutical Law Enforcement Officials held sessions in which the subjects of their respective activities were considered The American Association of Colleges of Pharmacy, National Association of Boards of Pharmacy and the National Con-

ference on Pharmaceutical Research held sessions in line with the programs printed in the July JOURNAL and these with the addresses of the presidents of the former will have to suffice for this comment. The Plant Science Seminar made tours of inspection to the Estacada Ginseng and Hydrastis projects, the Peavy Arboretum, Oregon State College, and convened in Portland for the consideration of papers.

Outstanding among the entertainment features was the trip along famous Columbia River Highway, with a visit to Bonneville \$32,000,000 dam and a Columbia River salmon barbecue luncheon at Eagle Creek. The annual banquet was presided over by F. C. Felter, at which time Dr. Tate Mason, president-elect of the American Medical Association, was introduced and addressed the guests, he was followed by Dr. Herbert C. Miller, president of the North Pacific College of Dentistry and a trustee of the American Dental Association. Mayor Carson welcomed the visitors and Hon. Dan J. Fry spoke for the Governor. The principal address was made by President R. P. Fischelis, officers and visiting pharmacists were introduced. Frank Nau received from his fellows a plaque in recognition of his services to the profession in the North Pacific section. An interesting feature was the conferring in full form the honor of Rosarians on the following: R. P. Fischelis, knighted with Lady Fairfax Rose, E. F. Kelly, Lady Hillingdon, Ernest Little, Roselandia, Harvey A. Henry, Marcia Stanhope, Dr. Tate Mason, President-Elect of A. M. A., Mary Hart, Charles H. Evans, Dean Hole Rose.

The following former presidents and members of their families attended the annual past-presidents' dinner: James H. Beal, E. G. Eberle, Wm. B. Day, S. L. Hilton, H. V. Arny, L. L. Walton, T. J. Bradley, C. W. Johnson, H. C. Christensen, W. D. Adams, Robert L. Swain. The attendance at the annual event indicates the continued interest of these members and speaks for their loyalty and appreciation of the honor conferred by the ASSOCIATION.

Nowhere can flowers be more beautiful and abundant, the artistic landscaping brought the colors into Nature's design. The scenery was awe-inspiring, magnificent, grand and beyond comparison—a panorama of wonders in which the hospitalities of the hosts were blended.

THE EIGHTY-FOURTH ANNUAL MEETING OF THE A. P. H. A.

THE 84th annual meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION will be held in Dallas, Texas, it so happens that the selection brings the ASSOCIATION to Texas during the celebration of the centenary of its independence and the establishment of the Republic of Texas. Celebrations will be held in a number of cities where events in the history of Texas took place, a fact which assures low rates to these points as well as to Dallas. The latter city has entertained many large organizations because of its hotel accommodations, automobile and railroad connections, it is 185 miles northeast of Austin, the State capital, and the home of the State University. The Medical and Dental Departments of Baylor University are located in Dallas. Among other educational institutions it is the seat of the Southern Methodist University, which has a campus of 625 acres and a \$2,000,000 endowment.

Mexico and Texas are bound together by economic interests and the boundary is practically as unfortified as that between Canada and the United States. The completion of the Mexican highway link with the opening of Texas Centennial brings Mexico into close proximity with the eighty-fourth annual meeting place.

SCIENTIFIC SECTION

BOARD OF REVIEW OF PAPERS — *Chairman*, F E Bibbins, George D Beal, L W Rising, H M Burlage L W Rowe, John C Krantz Jr Heber W Youngken
(To be revised)

SULPHIDE ANALOGUES OF AZO DYES HAVING BACTERICIDAL PROPERTIES *

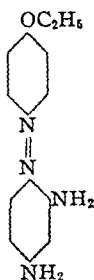
BY W BRAKER AND W G CHRISTIANSEN ¹

The bactericidal properties of a number of diaryl sulphides have been reported by Hilbert and Johnson (1) and by Moness, Braker and Christiansen (2) Since this activity is ascribed to the presence of the sulphide linkage, we have investigated the combination of this grouping with other active groups present in certain azo dyes known to be therapeutically valuable

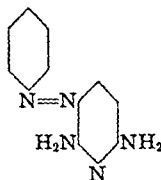
The compounds chosen for preparation contain the diaryl sulphide linkage combined with

- (1) The *p*-ethoxy benzene-azo residue of serenium (I),
- (2) The diamino pyridine grouping of pyridium (II)

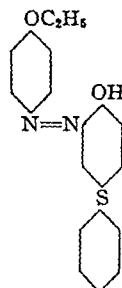
Of the first type we prepared one example 3-*p*-ethoxy benzene-azo, 4-hydroxy diphenyl sulphide (III) Of the second type two compounds were made 4,4'-bis-(α,α -diaminopyridine-azo) diphenyl sulphide (IV), and 3,5-bis(4'-amino diphenyl sulphide-azo) 2,6-diamino pyridine (V)



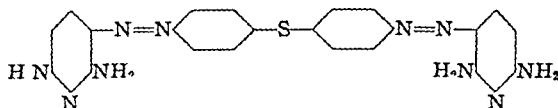
(I)



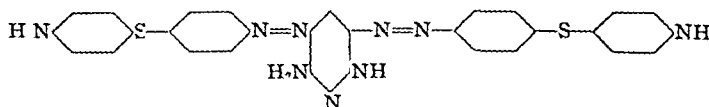
(II)



(III)



(IV)



(V)

* Scientific Section A Ph A Washington meeting 1934

¹ Research Department of the Chemical and Pharmaceutical Laboratories, E R Squibb and Sons Brooklyn N Y

These compounds were readily prepared, but were found to be only slightly soluble in any of the media in which they might be used. Compound III could not be dissolved in mixtures of alcohol, water and glycerin or in water containing an equivalent of NaOH. IV and V were practically insoluble in water containing an equivalent of HCl. They were, however, tested for antiseptic activity by means of the "cup test". In this attempt at evaluation, the powdered compounds were placed in depressions in the center of an inoculated (*Staphylococcus aureus*) area of nutrient agar, and the area of inhibition measured after 48 hours (3). Serenium and pyridium, used as controls, showed clear zones of 4-5 mm. III and IV, under these conditions, were quite inactive, and V was only slightly active.

EXPERIMENTAL

Preparation of 4,4' Diamino Diphenyl Sulphide—The method of Merz and Weith (4) was used, yielding yellowish white needles m p 104-108° C. The authors state 108° C as the m p.

Preparation of 2,6-Diamino Pyridine—The method of Tchitchibabin (5) yielded this substance in the form of silvery leaflets, m p 119° C, stated in the literature to be 119-120° C.

Preparation of p Hydroxy Diphenyl Sulphide—The preparation of this compound is described in a previous paper (1).

Preparation of 3 p Ethoxy Benzene Azo, 4 Hydroxy Diphenyl Sulphide—1.3 Gm p phenetidine was dissolved in a mixture of 21.5 cc of N-hydrochloric acid and 25 cc of water. The substance was diazotized at 0° C with a solution of 0.69 Gm NaNO₂ in 10 cc water. 2.02 Gm p-hydroxy diphenyl sulphide dissolved in 25 cc 2N NaOH was added with vigorous stirring. The reaction mixture was allowed to stand at 0° C for 2 hours then at 30° C for 4 hours longer. The red dye which had separated out was then filtered off, washed with water and dried *in vacuo*.

Yield—1.54 Gm of a red powder

Analysis Found—S, 9.40%, calculated for C₁₆H₁₄O₂N₂S—S, 9.14%

Preparation of 4,4'-Bis (α,α Diamino Pyridine Azo) Diphenyl Sulphide—4.2 Gm 4,4' diamino diphenyl sulphide was dissolved in a mixture of 20 cc conc hydrochloric acid and 50 cc water. Diazotization was carried out at 0° C with a solution of 2.7 Gm NaNO₂ in 20 cc water. 4.4 Gm of 2,6 diamino pyridine dissolved in dilute hydrochloric acid (one equivalent of HCl) was then vigorously stirred in. A red precipitate began to separate. After standing at 0° C for one hour, then at 30° C for 3 hours, the mixture was made ammoniacal. The precipitate was filtered off, washed with water and dried *in vacuo*.

Yield—8.2 Gm of an orange-colored powder

Analysis Found—S, 6.80%, calculated for C₂₂H₁₆N₁₀S—S, 7.02%

Preparation of 3,5 Bis (4' Amino Diphenyl Sulphide-Azo) 2,6-Diamino Pyridine—5.0 Gm 4,4' diamino diphenyl sulphide in 3 equivalents of dilute hydrochloric acid was diazotized at 0° C with a solution of 1.53 Gm NaNO₂ in 20 cc water. A slight residue, present after diazotization, was removed by filtration. To the clear filtrate was added with vigorous stirring, and at 0° C, 1.17 Gm 2,6-diamino pyridine dissolved in dilute hydrochloric acid. Immediate precipitation occurred. After standing at 30° C for 4 hours, the reaction mixture was made alkaline. The precipitate was filtered off, washed with water, sucked dry, washed with several portions of warm benzene and dried *in vacuo*.

Yield—4.5 Gm of a red powder

Analysis Found—S, 11.29%, calculated for C₂₂H₁₆N₆S₂—S, 11.37%

The biological tests on the compounds here reported were made in the Biological Research Laboratories of E. R. Squibb and Sons and we gratefully acknowledge their assistance.

SUMMARY

1 Three new dyes, containing the diaryl sulphide linkage, together with residues present in serenium and pyridium, have been prepared

2 These substances have been tested for antiseptic activity and have been found to be inactive

BIBLIOGRAPHY

- (1) Hilbert and Johnson, *J A C S*, 51, 1526 (1929)
- (2) Moness, Braker and Christiansen, *Jour A Ph A*, 21 558 (1932)
- (3) U S Department of Agriculture, *Circular No 198*, "United States Food and Drug Administration Methods of Testing Antiseptics and Disinfectants "
- (4) Merz and Weith *Ber*, 4, 384 (1871)
- (5) Tchitchibabin and Seide, *J Russ Phys Chem Soc*, 46, 1216 (1914)

PHYTOCHEMICAL NOTES *1

No 108 A PHYTOCHEMICAL STUDY OF THE SEED OF THE DIGGER PINE

BY JOSEPH SEMB

In the early part of November 1931, forty pounds of Digger pine seed were received from Mr J W Preston, Chuco, Calif One hundred of these seeds were cracked and separated into seed coats and endosperms The former weighed 53 20 Gm (= 76 9 per cent), the latter 15 95 Gm (= 23 1 per cent) Inasmuch as the 100 seeds weighed 69 15 Gm, the average weight of the individual seed is a trifle less than 0 7 Gm That of the endosperm is about 0 16 Gm

Samples of ground seed, of seed coats and of endosperm were extracted with selective solvents The data are recorded below

PERCENTAGE EXTRACTED

Solvent	From Seed Per Cent	From Seed Coat		From Endosperm	
		A (2) Per Cent	B (3) Per Cent	C (4) Per Cent	D (5) Per Cent
Pet ether	11 47 (1)	0 18	0 13	53 00	12 20
Ethyl ether	0 27	0 30	0 23	1 00	0 23
Chloroform	0 11	0 00	0 00	0 74	0 17
Alcohol	0 90	0 76	0 59	2 90	0 66
Water	1 98	2 00	1 44	8 20	1 89
1% HCl	15 00	18 20	14 00	27 18	6 26
1% NaOH	2 60	5 00	3 70		

Of the 40 pounds of seed, 37 5 pounds or 17 Kg were ground in the horizontal disk mill The coarsely comminuted material was extracted in the cold with petroleum ether for 24 hours After the percolate had been drawn off, the dregs were reground in a ball mill This reground residue was subsequently extracted twice with petroleum ether in the cold A test sample of the last extraction indicated that the extraction was almost complete Most of the petroleum ether was recovered The last traces were removed by heating on a water bath under somewhat reduced pressure for several hours During part of this time a current of CO₂ was passed through the liquid to assist in the complete removal of the volatile solvent The petroleum ether extract thus obtained weighed 1950 Gm = 11 47% of the seed or 49 66% of the endosperm

* Scientific Section, A Ph A, Miami meeting, 1931

¹ From the laboratory of Edward Kremers

After having been exhausted with petroleum ether, the ground seeds were percolated with alcohol. The last application of menstruum extracted about 0.15 per cent of the total seed. The recovery of the alcohol yielded a dark brown extract. 100 Gm of dregs, in four separate experiments were extracted with the following hot solvents yielding the amounts of extract recorded.

1	Chloroform	0.04 Per cent
2	Ethyl alc	1.13 Per cent
3	Methyl alc	1.06 Per cent
4	Acetone	0.28 Per cent

As a result of the extractions described the following products were obtained

- (1) A petroleum ether extract, consisting principally of fatty oil
- (2) A concentrate of the cold alcoholic percolate

(1) *The Petroleum Ether Extract (Fatty Oil)*—This product was almost colorless and odorless and had a bland taste. $d_{18}^{\circ} = 0.9177$ and $d_{4}^{\circ} = 0.9167$, $n_{D, 18} = 1.4713$ (Abbé), $[\alpha]_D = -0.30^{\circ}$. It solidified at about -15° .

The oil was perfectly neutral. Three saponification determinations gave 189.9, 190.4 and 189.0, respectively, or an average of 189.8. Its iodine value (Hanus) was found to be 120, its acetyl value 4.9 and 5.0. Its thiocyanogen value 83.1, 83.5, 82.3 or an average of 83.0 (6). From these three values, *viz.*, saponification, iodine and thiocyanogen, the following percentages were calculated: 4.3% of saturated fatty acids, 50.5% of oleic acid, and 45.2% of linoleic acid. When one cc was exposed to the air on a watch glass an increase in weight of 0.7% was observed after two weeks.

Ninety-seven grams of this oil were oxidized in acetone solution by means of potassium permanganate (7). Four separate fractions were obtained. The fatty acid obtained from the first fraction had a b p of 202° , $n_{D, 21} = 1.4146$, and a mean molecular weight of 115.1 (calculated from acid value), thus indicating hexoic acid. The second fraction yielded an acid with a b p of 246.2° and a molecular weight of 148.7 (from acid value). This indicates nonoic acid probably contaminated with hexoic acid. The third fraction yielded an acid which was insoluble in petroleum ether but somewhat soluble in hot water. It had a m p of 106° and a molecular weight of 188.2 (from acid value assuming a dicarboxylic acid). This indicated azelaic acid. The fourth fraction consisted of 16 and 18 carbon atom fatty acids.

These data indicate that the first double bond in every case is at the 9-10 position, also that this or a second double bond is in the 6-7 or 9-10 position from the end. Had malonic acid been isolated, these data would indicate that only two unsaturated fatty acids are present, that is, the 9-10 oleic and the 9-10, 12-13 linoleic acid. Undoubtedly malonic acid was formed but was lost in the process of purification and isolation.

1625 cc of the fatty oil were saponified by refluxing with alcoholic KOH. The alcohol was removed by vacuum distillation. About 14 liters of water were added to the potassium soap. The non-saponifiable material was extracted with ethyl ether. Troublesome emulsions were encountered, but the addition of small amounts of methyl alcohol was very effective in breaking these emulsions. Most of the ethyl ether was recovered from the unsaponifiable and the latter was turned over to Dr. Bonstedt.

Dilute sulphuric acid was now added to the soap solution, and immediately a fatty acid ethereal layer (about 3 l) separated out (This shows that the soap held a considerable quantity of ethyl ether in solution) The aqueous layer containing the glycerin was drawn off and shaken twice with ether The three ethereal portions were united and washed several times with water The ether and occluded water were removed by heating under vacuum for 2½ hours The total weight of fatty acid was 1390 Gm Iodine value 124.2, thiocyanogen value 85.0, acid value 198.1, molecular weight 283.1 (computed from the acid value) Using these three values, the following percentages were calculated saturated fatty acids 5.5%, oleic acid 51.0%, linoleic acid 43.5%

1223 grams of this fatty acid were dissolved in 7200 cc of alcohol This solution was then heated on the water-bath and to it were added 7200 cc of alcoholic lead acetate, containing 900 Gm of the salt (8) The mixture was exposed over night to a temperature of about 6° The next morning the supernatant liquor was drawn off and the mushy, sticky lead soap adhering to the side of the flask was redissolved in 7200 cc of hot alcohol which contained a little acetic acid Again the solution was set outside over night to permit the solid lead soap to settle out, and again the supernatant liquid was drawn off and the solid lead soap redissolved in hot alcohol, the alcoholic solution allowed to cool and filtered All the alcoholic solutions were mixed The mixed solutions are supposed to contain the lead soap of the liquid fatty acids The insoluble lead soap obtained was covered with 400 cc of ethyl ether After several days the ethereal solution was drawn off As will be seen later, the fatty acid recovered from the ethereal solution was added to the free fatty acids from the ether insoluble lead soap

The Solid Fatty Acids—The insoluble lead soap was decomposed with dilute HNO₃ and the freed fatty acids extracted with ethyl ether The ether was removed leaving a solid residue weighing 140 Gm with a melting point of 31° The attempt to separate the solid fatty acids by fractional crystallization was without success Likewise fractional precipitation as magnesium salts was unsatisfactory The odds and ends were gathered and found to weigh about 100 Gm To this was added the fatty acid obtained from the ethereal solution that had stood over the alcoholic insoluble lead soap The methyl esters of this mixture of supposedly saturated acids were made and distilled under 5 mm pressure

No	B P ° C	Wt.	M P ° C	Iodine No	Saponification Value
1	-160	9.8	17		
2	166-170	16.3	18.5	53.3	203.9
3	170-174	26.9	15.5		
4	174-176	25.7	12.0		
5	172 (4 1/2 mm)	20.68	9.0	84.9	201.7
6	176-182	45.8	12.0		191.1
7	182	15.7	15.0	77.8	
8	Residue	12.1			
		173.0			

The high iodine values may be attributed to imperfect separations It is well known that none of the methods are any too satisfactory The methyl ester fraction No. 3 was saponified and the freed fatty acid treated with lead acetate as stated above except that this solution was allowed to cool to only 18°, not to 6° The insoluble lead soap thus obtained was firm and not mushy as in the original separation The free fatty acid from this insoluble lead soap had a m p of 56°, an iodine value of 5.8, and a mean molecular weight of 261.7 (from the acid value), indicating a predominance of palmitic acid The freed fatty acid from the alcoholic supernatant liquid gave iodine values of 109.8, 110.8 and 112.8 or an average of

1112 This indicates the ratio of oleic to linoleic acid to be about the same as that in the original oil (9)

Methyl esters Nos 1 and 2 were mixed and bromine added at -10° to the petroleum ether solution. The unbrominated saturated fatty esters were separated by reduced pressure distillation. A fatty acid with a m p of 63° and whose corresponding methyl esters melted at 28° was obtained. This indicates that palmitic acid is present. The large amounts of acids obtained at various times from the various fractions with a melting point around 56° and a mean molecular weight of about 262 indicates that the greater amount of the saturated fatty acid is palmitic acid.

From fractions Nos 6 and 7 a fatty acid was isolated, this time by means of the lead-acetate-alcohol method, with a m p of 65.5° . The methyl ester of this had a m p of 39° . The mean molecular weight was 290° (from acid value). The presence of stearic acid was verified by means of a method suggested by E. Twitchell (10). To 20 parts of the above acid, weighed on an analytical balance, 80 parts of Eastman's stearic acid, also weighed on an analytical balance, was added. The mixture was dissolved in ether and the ether evaporated. The addition of these 20 parts of above acid to 80 parts of Eastman's stearic acid depressed the m p of the Eastman stearic acid less than one degree. Therefore, the larger part is stearic acid.

The high molecular weight of the stearic acid fraction discussed above indicates that a saturated fatty acid higher up in the series than stearic is present. From the methyl ester fraction No 8 a solid fatty acid fraction melting higher than that recorded in the literature for stearic acid was obtained. The quantity was too small to be identified.

The Liquid Fatty Acids—The alcohol-soluble lead soap was decomposed with H_2S . The freed acids were brominated in acetic acid (11), and from the reaction mixture 208 Gm of tetrabromstearic acid were obtained. The melting point of this pure white substance, upon recrystallization from petroleum ether, was 114.0° and the molecular weight, computed from the acid value, was found to be 608.0. The bromine content, determined by the Stepanow method, was found to be 53.27 per cent. The reported melting point of tetrabromstearic acid is 114.0° , the computed molecular weight 600, and the bromine content 53.3 per cent.

The filtrate from the tetrabromstearic acid, which is supposed to contain only the dibromstearic acid was debrominated with zinc. Five grams of the recovered fatty acid were oxidized with dilute $KMnO_4$. About one Gm of a petroleum ether-soluble fatty substance with a m p of 37.0° was obtained. The petroleum ether-insoluble residue was dissolved in alcohol. Upon cooling, about one Gm of a white substance with a m p of 131.5° was obtained. Hilditch reports 9,10 dihydroxy stearic acid to melt at 132.0° .

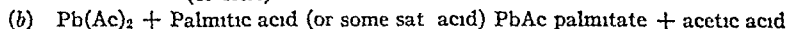
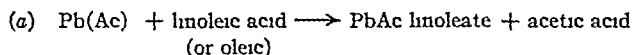
The rest of the liquid acid was steam distilled in order to see if there were any volatile fatty acids present, but the results were negative. This would rule out the presence of any appreciable amount of 6-, 8- and 10 carbon atom acids and possibly a 12-carbon atom acid. According to Hilditch's (*Fats and Waxes*, 74 (1927)) these lower saturated acids might be expected with the unsaturated acids.

Next the methyl esters were made of this liquid acid portion and the esters fractionated under 7 to 8 mm pressure.

No	B P ° C	Iodine Value	Mol Wt from Acid Values		Saponification Value	
1	-186 (8 mm)					
2	186-188 (7 mm)	110 7	290 0		193 4	
		110 3	291 3	290 7	192 1	192 8
3	186-188 (7 mm)					
4	188-190 (7 mm)					
5	190	120 5	290 7		193 0	
			291 8	291 3	192 3	192 6
6	190 + residue					

The very small change in boiling point would seem to indicate a very constant boiling constituent. However, the very high iodine value in these esters is noteworthy. The iodine value of oleic acid is 90.0 and that of methyl oleate about 86.0. This would indicate that a great deal of the linoleic acid had not been removed as tetra bromide. This fact was established by isolating tetrabromstearic acid when the freed acid was brominated in petroleum ether solution.

- (1) This percentage is obtained from fat extracted from the main experiment
- (2) Computed with reference to the seed coat
- (3) Computed with reference to the entire seed
- (4) Computed with reference to the endosperm
- (5) Computed with reference to the entire seed
- (6) The method of Zeleny and Baily, *J I E C*, 24, 109 (1932), was used
- (7) Hilditch and Vidyarthi, *Royal Society A* 122, 552 (1929)
- (8) Hilditch, *Fat and Waxes*, 74 (1927), Twitchell, E., *J I E C*, 13, 806 (1921)
- (9) Consideration of this fact, that at 6° a great deal of oleic and linoleic acids, in a ratio approximating that in the original, comes down while at 18° very little separates should be worth recalling when this experiment is repeated. If an alcoholic solution of lead acetate is added to an alcoholic solution of fatty acids the following situation arises



In this particular case reaction "a" predominates and the opportunity of PbAc palmitate to react with another palmitic acid molecule to yield $\text{Pb}(\text{palmitate})_2$ is remote compared with its opportunity to react with a molecule of linoleic acid to yield Pb palmitate linoleate, which undoubtedly is more soluble than Pb(palmitate) but less soluble than Pb(linoleate). The precipitate at 6° was probably a half-saturated and half unsaturated lead soap such as Pb palmitate-linoleate. At a higher temperature only the saturated lead soaps settle out.

(10) *J I E C*, 6, 564 (1914)

(11) Rosenthaler-Ghosh "The Chemical Investigation of Plants," 83 (1930)

THE LEAF OILS OF WASHINGTON CONIFERS VII JUNIPERUS OCCIDENTALIS *

BY E. V. LYNN AND LOUIS FISCHER ¹

Juniperus occidentalis Hook is a tree 20 to 40 feet or more in height. It grows on mountain slopes and high prairies of western Idaho, eastern Washington and Oregon and in the Cascade and Sierra Nevada mountains. Seldom is it found at elevations less than 6000 feet.

The leaves and branches for this work were collected in 1930 near Bend, Oregon. From 600 pounds of fresh material was obtained 986 Gm. of oil by steam dis-

* Scientific Section A. P. H. A. Washington meeting 1934

¹ Seattle, Washington June 7, 1934

tillation, a yield of about 0.36 per cent. Due to various reasons the oil was not examined at the time. Three years later it had resinsified somewhat and was, therefore, rectified with steam, giving a light yellow product with a characteristic odor of Juniper.

The constants, determined in the usual way, were d_{25}^4 0.9212, n_D^{25} 1.4745, $[\alpha]_D^{25} +21.91^\circ$, acid number 1.45, saponification number 110.53 (38.17 per cent of bornyl acetate), after acetylation 149.58 (11.06 per cent of free borneol, 41.05 per cent of total borneol). Aldehydes and ketones and primary alcohols were absent or present in very small quantities.

Free Acids—Extraction by 5 per cent sodium carbonate gave a small amount of free acids in which acetic acid was identified by color reactions and by conversion to ethyl acetate. Judging by odor, there may also be present a small amount of acid resembling valeric.

Phenols—Extraction by 5% NaOH solution gave 0.5 per cent of a dark brown liquid with an odor of creosote, which did not solidify above -15°C . No nitroso compound or urethane could be obtained from it, but it gave color reactions similar to carvacrol. With ferric chloride in aqueous solution it produced a violet color and in alcoholic solution a yellow-brown with a green tinge. The Flückiger test with chloroform and alkali resulted in a light red color, somewhat darker than with carvacrol.

The remaining oil was fractionated at 10 mm and that portion boiling below 95°C was repeatedly refractionated.

Fraction	Per Cent	Refraction
155-160°	1.61	
160-162	1.69	1.4700
162-169	10.15	1.4736
169-175	12.30	1.4805
175-180	6.31	1.4845
180-185	2.31	1.4802
Total	34.37	

Camphene—The first fraction $[\alpha]_D +9.9^\circ$, gave no nitrosochloride and probably contained no pinene. Portions of each of the first two fractions were hydrated by the well-known Bertram-Walbaum method, giving light yellow oils. No phenylurethanes could be obtained, but the odor was decidedly that of isoborneol and a camphoraceous odor was noted after oxidation with chromic acid. The amount of oil was too small to permit exact identification, but the presence of some camphene is indicated.

The third fraction was oxidized with potassium permanganate in the usual way for betapinene but no product like sodium nopinate or nopinone could be obtained. This fraction also gave no hydrochloride.

Alpha Phellandrene—Fractions three, four and five gave copious yields of a nitrite melting at 112°C . This was repeatedly dissolved in chloroform and precipitated with methyl alcohol, finally giving a melting point of 114°C . This shows the presence of alpha phellandrene.

Fraction five had an odor of limonene but gave no nitrosochloride and no bromide, nor did fraction four.

Cymene—The last two fractions contained small amounts of cymene, as was

shown by oxidation with hot potassium permanganate to *p*-hydroxy isopropyl benzoic acid, melting at 154–155° C

The oil of higher boiling point was saponified by 3 per cent alcoholic potassium hydroxide for two hours and then submitted to repeated fractionation at 10 mm into three portions

Fraction	Per Cent	Refraction
– 95°	1 07	1 4778
95–120	39 69	1 4744
120–125	1 84	1 4885
Above 125 and loss	23 03	
Total	65 63	

Borneol —The first two consisted almost entirely of borneol which was separated in the crystalline state, melting point 203–204° C, phenylurethane 138° C. Oxidation of the oil gave camphor, identified by odor and by the semicarbazone melting at 235–236° C

Although terpineol was suspected, no nitrosochloride could be obtained from the second fraction. Also cadinene was not present in the last distillate nor in the residue, since no hydrochloride could be obtained

Combined Acids —The alkaline liquor from saponification was concentrated, acidified and then distilled with steam. Practically all of the acid was found in the distillate and appeared to consist almost entirely of acetic acid. This was identified as before by conversion to ethyl acetate

Summary —The fresh leaves and branches gave 0.36 per cent of oil whose composition was found to be about: bornyl acetate 40, borneol 11, alpha phellandrene, cymene and probably camphene 35, acetic acid 0.2, phenols 0.5, compounds of higher boiling point and loss 14 per cent

DRUG EXTRACTION. IV. THE EFFECT OF VARIATION IN SOLVENTS ON THE EXTRACTION OF JALAP^{1,2}

BY WILLIAM J. HUSA³ AND PAUL FEHDER

Jalap having been selected as a typical resin-containing drug, a study was made of the effect of solvents in relation to swelling, penetration, imbibition and extraction

EXPERIMENTAL PART

Material Used —From a reputable dealer, a 125 lb shipment of Jalap U. S. P. was obtained, consisting of 10 lbs whole drug, 40 lbs of 60 mesh and 25 lbs each of 20, 40 and 80 mesh, according to the following specifications. The above samples are to be prepared by taking 125 lbs of jalap, selecting a representative sample of 10 lbs for the whole root and a representative 40 lb sample to be milled to 60 mesh and three separate 25 lb samples to be milled to 20, 40 and 80 mesh, respectively. Each portion is to be milled separately so that all portions will be as nearly alike as possible, except for the difference in milling."

¹ Presented before the Scientific Section, A. P. H. A., Washington, D. C., 1934

² This paper is based on a thesis presented to the Graduate Council of the University of Florida by Paul Fehder in partial fulfillment of the requirements for the degree of Master of Science in Pharmacy

³ Head Professor of Pharmacy, University of Florida

A thorough pharmacognostical study showed that the shipment conformed with the U S P requirements

Swelling of Jalap in Solvents—The swelling effect of solvents was determined by the technique (1) of measuring the width of thin strips of jalap tissue before and after addition of solvents using a filar micrometer. The strips, 0.25 to 0.50 mm in width, were cut from sections obtained by use of a small carpenter's plane. The results are expressed on a percentage basis taking the width of the dry strips as 100 and each value is the average of several determinations. The thickness of the sections was measured by means of a micrometer caliper.

TABLE I—SWELLING EFFECT OF SOLVENTS ON SECTIONS OF DECORTICATED JALAP TISSUE

Solvent	Section	Average Thickness of Section in Mm	Width of Section (on Basis Dry = 100) After Time in Minutes									
			Dry		Wet.							
			0	1	5	10	20	40	60	100	120	
Water	Cross	0.042	100	133	134	134	133	133	134	134	133	
Alcohol	Cross	0.044	100	101	103	106	108	110	109	110	110	
Alcohol	Longitudinal	0.066	100	100	100	105	108	111	112	117	117	

The results in Table I indicate that swelling equilibrium is attained during the first minute in water but only after 40 minutes or more in alcohol. Further tests showed that longitudinal sections swelled 47% during the first minute in water on the average, the swelling was 60-70% in sections containing much transporting tissue and 35-45% in sections consisting chiefly of starch bearing parenchyma. The initial swelling of longitudinal sections in alcohol likewise varied from 6% in sections containing much transporting tissue to 0% in those consisting mostly of starch bearing parenchyma. During the first minute cortical tissue showed neither expansion nor contraction in alcohol while in water pure cork tissue swelled to about twice its original size, outer bark with a large proportion of cork swelled about 40% and outer bark with little cork swelled about 25%.

Penetration of Solvents into Jalap Blocks—Using a special machine saw at the planing mill, blocks were cut with the grain running the long way, the blocks being 10 mm square and averaging 2.4 mm in thickness. Using three blocks for each solvent, these were immersed in water, alcohol and glycerin, respectively, contained in bottles. The bottles were then suspended in a Freas large-size water thermostat, at 30° C. After various intervals, the blocks were removed, excess solvent taken up with filter paper, and the blocks weighed and measured. The chances for error in measuring swelling with a micrometer caliper between surfaces that are somewhat flexible are considerable and may lead to deviations that would not be shown in similar measurements between rigid surfaces. However, by taking the average of several blocks, the degree of error is reduced to an extent which allows helpful conclusions to be drawn.

TABLE II—PENETRATION OF LIQUIDS INTO JALAP BLOCKS

(Average Weight of Three Blocks Stated on Basis Dry Weight = 100%)

	After Time Intervals in Hours													
	0	1	2	3	9	12	24	48	72	96	216	552	720	888
Water	100	194	224	238	208	213	250	243	238	242	233	229	233	228
Alcohol	100	141	141	141	104	104	143	133	135	138	130	131	133	143
Glycerin	100	130	130	130	102	101	130	121	121	122	117	125	130	141

As shown in Table II, the liquids penetrated rapidly during the first hour. Between three hours and nine hours there was a sharp drop in weight of the blocks.

in each of the three liquids probably due to loss of soluble constituents, followed by an increase in weight, reaching a maximum at 24 hours and showing only slight changes thereafter

TABLE III —SWELLING OF JALAP BLOCKS IN LIQUIDS
(Average Thickness of Three Blocks Stated on the Basis Dry = 100%)

	After Time Intervals in Hours													
	0	1	2	3	9	12	24	48	72	96	216	552	720	888
Water	100	109	119	124	131	130	127	127	128	126	123	123	120	121
Alcohol	100	100	100	100	102	101	101	101	101	101	100	101	101	101
Glycerin	100	100	99	99	99	99	98	98	98	98	98	100	101	102

As shown in Table III swelling by water reaches a maximum of 31 per cent in nine hours. From then on, the thickness of the blocks gradually decreases, due apparently to the loss of water-soluble substances. Alcohol causes very little swelling, a maximum of 2 per cent is observed at the end of nine hours. Glycerin causes a slight shrinkage, due possibly to the abstraction of water from the cells, followed by recovery and very slight swelling.

Effect of Solvents on Powdered Jalap—In studying the effect of solvents on powdered jalap, a filtration method devised in the present study but previously described by Husa and Magid (1) was used. The filtrates were assayed for total resins by Warren's method (2). The drug was found to contain 7.87 per cent of resin by the U. S. P. method of assay and 6.87 per cent by Warren's method of assay. Warren reported results of his collaborators, showing a similar lower result by his method than by the U. S. P. method, due, apparently, to removal of coloring matter, sugars and other water-soluble extractives from the resin by Warren's method.

TABLE IV —EFFECT OF SOLVENTS OF JALAP IN No. 60 POWDER

Period of Maceration	Liquid in Marc	Weight in Gm. of				Resins in Filtrate
		Dry Marc.	Filtrate	Loss of Menstruum	Total Extractive	
Absolute Alcohol						
15 min	7.9	8.42	81.5	1.2	0.69	0.55
1 hour	7.9	8.40	81.9	0.8	0.70	0.57
5 hours	8.3	8.39	81.5	0.8	0.72	0.57
24 hours	8.3	8.32	81.8	0.5	0.78	0.57
Alcohol *						
15 min	8.7	8.22	81.5	1.0	0.88	0.61
30 min	8.4	8.18	81.5	1.2	0.96	0.59
1 hour	8.9	8.18	81.0	0.8	0.93	0.56
5 hours	9.1	8.11	81.1	0.6	1.01	0.57
24 hours	8.5	8.02	81.8	0.6	1.08	0.58
Alcohol 9 Vol —Water 1 Vol						
15 min	9.9	7.42	80.8	0.6	1.68	0.58
1 hour	10.2	7.36	80.7	0.6	1.76	0.57
5 hours	9.5	7.21	81.6	0.5	1.90	0.59
24 hours	9.5	7.15	81.5	0.6	1.96	0.59

Alcohol 4 Vol —Water 1 Vol

15 min	10 8	6 81	80 2	0 7	2 29	0 57
1 hour	11 7	6 74	79 5	0 5	2 34	0 56
5 hours	11 4	6 75	79 5	0 8	2 34	0 56
24 hours	11 6	6 76	79 5	0 6	2 33	0 56

Alcohol 3 Vol —Water 2 Vol

15 min	13 0	6 34	78 4	0 6	2 77	0 50
1 hour	12 9	6 34	78 2	0 7	2 76	0 49
5 hours	13 1	6 40	78 0	0 7	2 70	0 49
24 hours	13 1	6 38	78 2	0 6	2 74	0 50

Alcohol 1 Vol —Water 2 Vol

15 min	17 1	6 52	73 6	0 6	2 57	0 22
1 hour	17 0	6 46	74 0	0 4	2 66	0 18
5 hours	17 1	6 32	73 9	0 5	2 80	0 20
24 hours	16 7	6 10	74 4	0 5	3 00	0 19

Alcohol 1 Vol —Water 7 Vol *

15 min	22 1	6 7	68 4	0 9	2 4	Less than 0 1%
1 hour	23 7	6 6	67 1	0 7	2 5	Less than 0 1%
5 hours	23 5	6 6	66 9	1 0	2 5	Less than 0 1%
24 hours	22 8	6 5	68 1	0 7	2 6	Less than 0 1%

Distilled Water *

15 min	27 0	6 8	63 2	0 9	2 3	Negligible
1 hour	27 5	6 7	62 2	1 6	2 4	Negligible
5 hours	28 7	7 2	60 3	0 4	2 1	Negligible
24 hours	27 9	6 7	61 5	0 9	2 6	Negligible

* Conducted at room temperature, all others conducted in thermostat at 30° C

From the results in Table IV, it appears that the extraction of resin is as complete in 15 minutes as in 24 hours, but the percentage of total extractive in the filtrates increases with time. With higher percentages of alcohol, imbibition decreases and less extraneous matter is extracted along with the resins. The higher percentages of alcohol extract the same amount of resin but with alcohol 4 vol — water 1 vol and more aqueous mixtures, less resin is extracted.

DISCUSSION OF RESULTS

Effect of Solvents on Thin Strips —Swelling equilibrium in thin strips of jalap tissue was reached within 1 minute, as was the case with chestnut wood (1) and the wood of belladonna root (3). For the same type of jalap tissue, swelling across the grain in liquids was greater in longitudinal sections than in cross sections. Perhaps this means that in a cross section of a fibre or vessel, there is more mechanical resistance to swelling than when the fibre or vessel is split longitudinally.

Penetration and Swelling of Jalap Blocks —There is no direct relationship between the rate of swelling and the rate of increase in weight. At nine hours, the swelling with water and with alcohol is at a maximum, while the weight of the blocks is at a minimum. The blocks immersed in alcohol gained about 40% in weight, while the swelling was not over 2%.

Imbibition and Extraction of Powdered Jalap—Using belladonna root in No 40 powder, Husa and Magid (1) found that imbibition of alcohol-water mixtures increased with decreasing alcohol content, similar results were obtained in the present study using jalap in No 60 powder. As far as present results go, alcohol of U S P strength and absolute alcohol seem to be the best solvents for the extraction of jalap resin, with more aqueous mixtures a greater proportion of inert extractive is removed along with the resin.

SUMMARY

Alcohol, water and glycerin have been studied from the standpoint of swelling effects and rate of penetration, using jalap in the form of thin strips and blocks. Using a series of alcohol-water mixtures in a study of imbibition and extraction of powdered jalap, it was found that with increasing concentration of alcohol there is a decrease in imbibition and a decrease in the proportion of extraneous matter extracted along with the resins.

REFERENCES

- (1) Husa and Magid, *Jour A Ph A*, 23, 891 (1934)
- (2) L E Warren, *J Assoc Official Agr Chem*, 15, 448 (1932)
- (3) Husa and Huyck, *Jour A Ph A* 24 446 (1935)

THE APPLICATION OF STATISTICAL METHODS TO PHARMACEUTICAL RESEARCH IV METHODS OF RECORDING DRUG ACTION

BY J C MUNCH¹ AND F E GARLOUGH²

How much of a drug is required to produce a definite action? This question constantly arises in discussing the narcotic potency of a drug like cocaine, the relative soporific value of several barbiturates, the anesthetic concentration of ether, the cathartic dose of cascara, the lethal or the convulsant dose of strychnine. Official compendiums list the "doses" of drugs as a matter of convenience and of practicality. Many original articles dealing with quantitative measures of drug action, as well as compilations of toxic and lethal doses (9) give tables showing doses per animal or per kilo, which are withstood, which produce injury, which produce the desired type of response, or which produce death within stated time limits.

The general impression is regarding relationship of dose to effect results from the usual method of laboratory study. A series of doses of a product is given to animals and the effects observed. Too small a dose fails to produce discernible or detectable effects; this is a "subminimal" or "subliminal" quantity. As the dose is increased there is a change in the normal appearance of the test animal, which is attributed to the action of the drug. After showing the characteristic response for some time, the effect passes off and the animal recovers. The smallest concentration that produces such a response is often called the "minimum effective dose" (MED). Increases in dose cause greater intensity or prolongation of action until a quantity is reached that causes some of the test animals to die. This dose may be

¹ Director, Pharmacological Research, Sharp and Dohme, Philadelphia, Pa. and Consulting Pharmacologist, Bureau Biological Survey, Washington, D. C.

² Director, Control Methods Research Laboratory, Denver, Colo.

Alcohol 4 Vol —Water 1 Vol

15 min	10 8	6 81	80 2	0 7	2 29	0 57
1 hour	11 7	6 74	79 5	0 5	2 34	0 56
5 hours	11 4	6 75	79 5	0 8	2 34	0 56
24 hours	11 6	6 76	79 5	0 6	2 33	0 56

Alcohol 3 Vol —Water 2 Vol

15 min	13 0	6 34	78 4	0 6	2 77	0 50
1 hour	12 9	6 34	78 2	0 7	2 76	0 49
5 hours	13 1	6 40	78 0	0 7	2 70	0 49
24 hours	13 1	6 38	78 2	0 6	2 74	0 50

Alcohol 1 Vol —Water 2 Vol

15 min	17 1	6 52	73 6	0 6	2 57	0 22
1 hour	17 0	6 46	74 0	0 4	2 66	0 18
5 hours	17 1	6 32	73 9	0 5	2 80	0 20
24 hours	16 7	6 10	74 4	0 5	3 00	0 19

Alcohol 1 Vol —Water 7 Vol *

15 min	22 1	6 7	68 4	0 9	2 4	Less than 0 1%
1 hour	23 7	6 6	67 1	0 7	2 5	Less than 0 1%
5 hours	23 5	6 6	66 9	1 0	2 5	Less than 0 1%
24 hours	22 8	6 5	68 1	0 7	2 6	Less than 0 1%

Distilled Water *

15 min	27 0	6 8	63 2	0 9	2 3	Negligible
1 hour	27 5	6 7	62 2	1 6	2 4	Negligible
5 hours	28 7	7 2	60 3	0 4	2 1	Negligible
24 hours	27 9	6 7	61 5	0 9	2 6	Negligible

* Conducted at room temperature, all others conducted in thermostat at 30° C

From the results in Table IV, it appears that the extraction of resin is as complete in 15 minutes as in 24 hours, but the percentage of total extractive in the filtrates increases with time. With higher percentages of alcohol, imbibition decreases and less extraneous matter is extracted along with the resins. The higher percentages of alcohol extract the same amount of resin but with alcohol 4 vol — water 1 vol and more aqueous mixtures, less resin is extracted.

DISCUSSION OF RESULTS

Effect of Solvents on Thin Strips —Swelling equilibrium in thin strips of jalap tissue was reached within 1 minute, as was the case with chestnut wood (1) and the wood of belladonna root (3). For the same type of jalap tissue, swelling across the grain in liquids was greater in longitudinal sections than in cross sections. Perhaps this means that in a cross section of a fibre or vessel, there is more mechanical resistance to swelling than when the fibre or vessel is split longitudinally.

Penetration and Swelling of Jalap Blocks —There is no direct relationship between the rate of swelling and the rate of increase in weight. At nine hours, the swelling with water and with alcohol is at a maximum, while the weight of the blocks is at a minimum. The blocks immersed in alcohol gained about 40% in weight, while the swelling was not over 2%.

Imbibition and Extraction of Powdered Jalap—Using belladonna root in No 40 powder, Husa and Magid (1) found that imbibition of alcohol-water mixtures increased with decreasing alcohol content, similar results were obtained in the present study using jalap in No 60 powder. As far as present results go, alcohol of U S P strength and absolute alcohol seem to be the best solvents for the extraction of jalap resin, with more aqueous mixtures a greater proportion of inert extractive is removed along with the resin.

SUMMARY

Alcohol, water and glycerin have been studied from the standpoint of swelling effects and rate of penetration, using jalap in the form of thin strips and blocks. Using a series of alcohol-water mixtures in a study of imbibition and extraction of powdered jalap, it was found that with increasing concentration of alcohol there is a decrease in imbibition and a decrease in the proportion of extraneous matter extracted along with the resins.

REFERENCES

- (1) Husa and Magid, *Jour. A. Ph. A.*, 23, 891 (1934)
- (2) L. E. Warren, *J. Assoc. Official Agr. Chem.*, 15, 448 (1932)
- (3) Husa and Huyck, *Jour. A. Ph. A.*, 24, 446 (1935)

THE APPLICATION OF STATISTICAL METHODS TO PHARMACEUTICAL RESEARCH. IV. METHODS OF RECORDING DRUG ACTION

BY J. C. MUNCH¹ AND F. E. GARLOUGH²

How much of a drug is required to produce a definite action? This question constantly arises in discussing the narcotic potency of a drug like cocaine, the relative soporific value of several barbiturates, the anesthetic concentration of ether, the cathartic dose of cascara, the lethal or the convulsant dose of strychnine. Official compendiums list the "doses" of drugs as a matter of convenience and of practicality. Many original articles dealing with quantitative measures of drug action, as well as compilations of toxic and lethal doses (9) give tables showing doses per animal or per kilo, which are withstood, which produce injury, which produce the desired type of response, or which produce death within stated time limits.

The general impression is regarding relationship of dose to effect results from the usual method of laboratory study. A series of doses of a product is given to animals and the effects observed. Too small a dose fails to produce discernible or detectable effects; this is a "subminimal" or "subliminal" quantity. As the dose is increased there is a change in the normal appearance of the test animal, which is attributed to the action of the drug. After showing the characteristic response for some time, the effect passes off and the animal recovers. The smallest concentration that produces such a response is often called the "minimum effective dose" (MED). Increases in dose cause greater intensity or prolongation of action until a quantity is reached that causes some of the test animals to die. This dose may be

¹ Director, Pharmacological Research, Sharp and Dohme, Philadelphia, Pa. and Consulting Pharmacologist, Bureau Biological Survey, Washington, D. C.

² Director, Control Methods Research Laboratory, Denver, Colo.

The U S P guinea pig method for the bioassay of aconite requires that 0.060 mg of aconitine per Kg should kill 2 of 3 guinea pigs within 12 hours after subcutaneous injection. This would correspond to 0.06 $\text{mg}_3\text{LD}_{67}$. Compared at this level, the LD_{67} of aconitine for rats was 0.175 mg per Kg showing that approximately 3 times as large a dose of aconitine was required to kill rats as to kill guinea pigs.

In studying the action of picrotoxin upon mice following subcutaneous injections, it was found (20) that doses below 1.5 mg per Kg produced no detectable effect, doses between 2.0 and 3.5 mg per Kg produced convulsions, and doses be

TABLE II—ACTION OF PICTROTOXIN UPON MICE—SUBCUTANEOUS INJECTION

Dose Mg/Kg	Per Cent Showing Convulsions	Per Cent Showing Death
1.5	0	0
2.0	54	0
2.5	80	0
3.0	96	35
3.5	100	22
4.0	100	29
4.5	100	23
5.0	100	69
5.5	100	100

TABLE III—POSITIVE MOUSE TAIL RESPONSE OF MICE TO MORPHINE—SUBCUTANEOUS INJECTION

Dose Mg/Kg	Per Cent Showing Positive Response		
	Lab A	Lab B	Lab C
0.5		16	
1.0		53	0
1.11	8		
1.25	20		1
1.43	39		
1.67	60		5
2.0	85	79	10
2.5		91	20
3.0		100	31
4.0			40
5.0		100	65
6.0			90
7.0			100

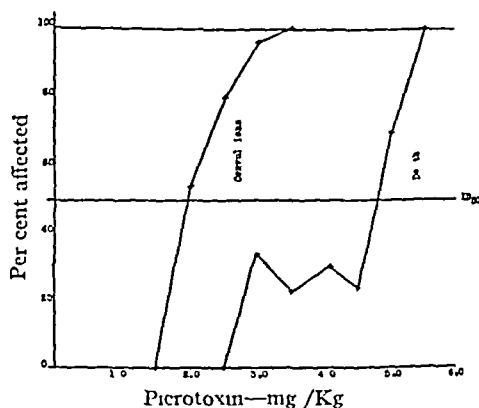


Fig 2—Action of picrotoxin on mice—subcutaneous injection

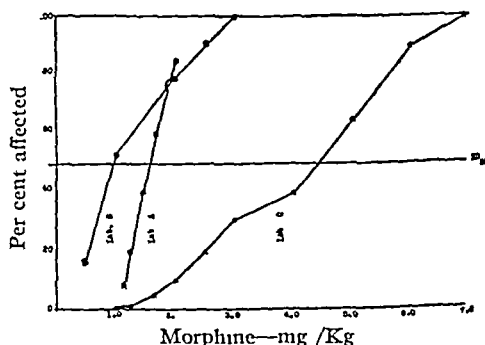


Fig 3—Positive reactions of mice to morphine—subcutaneous injection

tween 3.0 and 3.5 mg per Kg produced death (Table II and Fig 2). Plotting these results showed a convulsant zone extending on the one side into the non-convulsant, and on the other to the death zone. Bioassays of picrotoxin and its preparations could be made by simultaneous tests upon mice with a standard picrotoxin and the unknown product, to determine the $\text{LD}_{80\%}$, and the activity could be expressed in terms of standard picrotoxin. In general, 5 mg per Kg of picrotoxin produced this effect, although variations in the susceptibility of the mouse colony required the use of doses ranging from 4 to 7 mg per Kg. The CD_{50} was approximately 2 mg_3 , the LD_{50} 4 mg_3 , or twice the CD .

In studying the variations in susceptibility of mice to subcutaneous injections of morphine solutions (19), using the "tail curve" as an index of activity, tests were conducted independently in three different laboratories. Results obtained are shown in Table III and Fig 3 and indicate typical S-curve responses. The differences in quantitative responses in different laboratories indicate the effects of various conditions that were not identical. For this reason it is obviously necessary to standardize the behavior of test mice. These great divergences in different laboratories indicate the futility of attempting to say that a particular dose of morphine is the smallest dose that will produce a typical curvature of the tail.

Our studies upon the lethal doses of strychnine administered subcutaneously, intraperitoneally, incorporated with food or administered by stomach tube to hundreds of ground squirrels, prairie dogs and rats have shown wide species variations. In tests by Moore, Spencer and Ward, under various working conditions, attempts have been made to determine the LD_{10} , LD_{50} , LD_{90} and LD_{100} upon animals deprived of food for 24 hours, then fed bait containing a known amount of strychnine, or injected with 0.5 per cent strychnine solution by stomach tube. In the control of noxious rodents, it is desired to obtain at least LD_{90} and it is ideal to hope for an LD_{100} response. The data obtained on adult animals following oral administration of strychnine in the course of these investigations are given in Table IV and Fig 4. It is obvious that there is a species difference between the Douglas ground squirrel and the Columbian ground squirrel. The former is much more susceptible to small doses, even though the LD_{100} doses are practically identical. The different effects following changes in altitude are observed in the results obtained on rats. In Ward's experiments in Denver (27) at 5280 feet, rats were much more susceptible than litter mates that had been shipped to Portland, Oregon, held there for three months on the same food, and then injected with the same strychnine by Moore (27).

TABLE IV.—VARIATION IN ORAL LETHAL DOSE OF STRYCHNINE FOR RODENTS
DOSE IN MG /KG

Animals	Per Cent Killed			
	LD_{10}	LD_{50}	LD_{90}	LD_{100}
Ground squirrel (Douglas)	3.0	8.0	20	22.0
Ground squirrel (Columbian)	8.0	12.0	18	22.5
Prairie Dog (Zuni)	3.0	4.0	5	7.0
Rats—Denver	5.0	7.5		10.0
Rats—Portland	7.5	9.0		12.5

increase in altitude. The LD_{100} was 22.5 mk at 2600 feet, and decreased approximately 1 mk for every 500-foot elevation to an LD_{100} of 15 mk at 6500 feet.

In studies upon Zuni prairie dogs, the season has been found to affect the toxicity, possibly because of the differ-

Tests by Moore on 482 Columbian ground squirrels showed definite variations in susceptibility to strychnine with

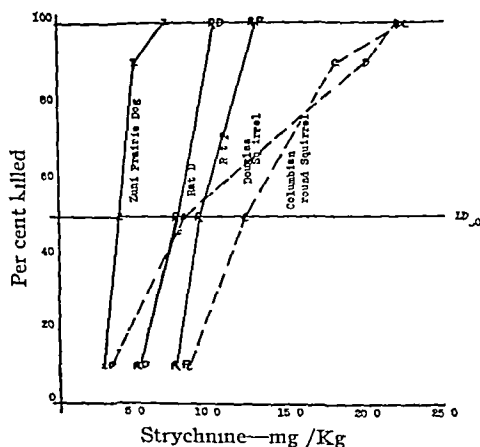


Fig 4.—Toxicity of strychnine to rodents—oral administration—mg /Kg

ence in tannin content of the food In the spring the LD_{100} was 7 mk, in the fall, 4 mk In these various tests, at various altitudes, and with animals on various diets, however, the response to strychnine has been found to follow an S shape curve, whether considering the convulsant or the fatal dose

CONCLUSIONS

- 1 The standard curve is useful in recording the relation between dose and effect
- 2 Most accurate results are obtained in determining those doses that produce desired responses in half of the animals tested
- 3 By using a subscript before the statement of effect to indicate the number of animals employed, and another after it to indicate the degree of response used as a criterion ($nED\%$), drug action may be quantitatively recorded with maximum convenience and minimum labor

REFERENCES

- (1) Behrens, B, "Zur Auswertung der Digitalisblätter im Froschversuche," *A E P P* 140, 237-256 (1929)
- (2) Bliss, C I, "The Method of Probits," *Science*, 79, 38-39 (1934)
- (3) Bliss, C I, "The Method of Probits," *Ibid*, 79, 409-410 (1934)
- (4) Burn, J H, "Methods of Biological Assay," Milford, London, 1928
- (5) Burn, J H, *Physiological Reviews*, 10, 146 (1930)
- (6) Chapman, C W, and Morrell C A, "On the Biological Assay of Strophanthus," *Q J P P*, 4, 195-208 (1931)
- (7) Denny, F E, "Formulas for Calculating Number of Fruits Required for Adequate Sample for Analysis," *Bot Gaz*, 73, 44-57 (1922)
- (8) Durham, F M, Gaddum, J H, and Marchal, J E, "Reports on Biological Standards II Toxicity Tests for Novarsenobenzene (Neosarsan)," Special Report 128, Med Res Council (1929)
- (9) Flury, F, and Zernik, F, "Zusammenstellung der Toxischen und Letalen Dosen für die Gebräuchlichsten Gifte und Versuchstiere," In Abderhalden's Handbuch der Biologischen Arbeitsmethoden Abt 4, Teil 7, Lief 251 (1928)
- (10) Gaddum, J H, "Reports on Biological Standards III Methods of Biological Assay Depending on a Quantal Response," Special Report 183, Med Res Council (1933)
- (11) Raymond-Hamet, "Determination de la Dose de Digitaline Cristallisee Nativelle qui est Lethale pour la Grenouille et Application a Cette Determination de la Courbe de Toxicite Dite de Trevan," *Rev Pharmacologie et therap exp*, 4, 268-309 (1933)
- (12) Hemmingsen, Axel M, "The Accuracy of Insulin Assay on White Mice," *Q J P P* 6, 39-80, 187-218 (1933)
- (13) Hemmingsen, Axel M, and Marks, H P, "The Influence of the Experimental Temperature in the Assay of Insulin by Means of Convulsions in Mice," *Ibid*, 6, 81-89 (1933)
- (14) Kärber, G, "Beitrag zur kollektiven Behandlung pharmakologischer Reihenversuche," *A E P P*, 162, 480-483 (1931)
- (15) Morrell, C A, and Chapman, C W, "On the Determination of the Toxicity of Neoarsphenamine II The Determination of the Characteristic Curve for Rats," *J P E T*, 48, 391-409 (1933)
- (16) Munch, James C, "The Application of Statistical Methods in Pharmaceutical Research I Measures of Accuracy," *Jour A Ph A*, 20, 122-127 (1931)
- (17) Munch, James C, "Bioassays" (1931) Williams and Wilkins, Baltimore Md
- (18) Munch, James C, "The Application of Statistical Methods in Pharmaceutical Research II Correlation Coefficients," *Jour A Ph A*, 20, 203-207 (1931)
- (19) Munch, James C, "Saliva Tests I Morphine," *Ibid* 23, 766-773 (1934)

- (20) Munch, James C, and Ponce, A M, "The Bioassay of Picrotoxin and *Cocculus Indicus* Preparations," *Jour A Ph A*, 23, 98-104 (1934)
- (21) Munch, James C, and Gittenger, G S, "Bioassays of Aconite and Its Preparations I Lethal Dose of Aconitine to Rats," *Ibid* 18, 17-24 (1929)
- (22) Reiner, L, 'On the Relation between Toxicity, Resistance and Time of Survival, and on Related Phenomena' *J Gen Physiol*, 17, 409-444 (1934)
- (23) Shackell, L F, Studies in Protoplasm Poisoning I Phenols," *Ibid*, 5, 783-805 (1923)
- (24) Shackell L F, Studies in Protoplasm Poisoning II Recovery," *J P E T* 32, 237-240 (1928)
- (25) Shackell, L F, Relation of Dosage to Effect," *Ibid*, 24 53-65 (1924), 25, 275-288 (1925)
- (26) Trevan, J W, The Error of Determination of Toxicity," *Proc Roy Soc (London)*, 101B, 483-514 (1927)
- (27) Ward, J C and Moore A W 'Effect of Altitude on the Action of Strychnine' *Jour A Ph A*, 24, 460-464 (1935)

CYANIDE POISONING AND ITS TREATMENT * 1 2

BY K K CHEN, CHARLES L ROSE AND G H A CLOWES

MORTALITY STATISTICS

Cyanide poisoning is less frequent than mercury or strychnine poisoning, although during recent years the death rate from cyanide poisoning has been increasing In Table I it will be seen that in the United States Registration Area there were 134 deaths from cyanide poisoning in 1930, and 243, 408 and 416 in 1931,

TABLE I—MORTALITY STATISTICS FROM CYANIDE POISONING **

Locality	Population (1930 Census)	1922	1923	1926	Total Number of Deaths								
					1927	1928	1929	1930	1931	1932	1933	1934	
U S Registration Area	122,775,046	102	113	79	84	108	141	134	243	408	416	*	
New York City	6,930,446	*	*	14	11	23	21	34	16	42	35	27	
Chicago	3,376,438	*	*	3	8	14	4	12	16	25	17	6	
Philadelphia	1,950,961	*	*	2	2	1	3	0	3	4	3	*	
Detroit	1,568,662	*	*	2	0	6	2	7	5	15	11	5	
Los Angeles	1,238,048	*	*	12	14	19	14	18	23	34	33	25	
Cleveland	900,429	*	*	1	0	3	2	0	1	4	6	1	
Saint Louis	821,960	*	*	6	2	6	2	7	9	8	6	2	
Baltimore	804,874	*	*	1	2	1	5	3	2	5	1	1	
Boston	781,188	*	*	0	6	2	0	3	8	7	3	8	
Pittsburgh	669 817	*	*	1	1	2	1	2	5	3	1	1	
San Francisco	634 394	*	*	9	9	8	10	11	12	21	22	23	

* Data not available

** In the compilation of this Table, we were greatly assisted by Dr T F Murphy, Chief Statistician for Vital Statistics, Bureau of Census, Department of Commerce Washington who generously turned over to us all the data which he has collected with meticulous care Our indebtedness must also be acknowledged to Doctors J C Geiger, Director of the Department of Public Health, City and County of San Francisco, Herman N Bundesen President of the Board

* This article is based on a scientific exhibit held at the joint meeting of the American Medical Association and the Canadian Medical Association, Atlantic City, June 10-14 1935

¹ From the Lilly Research Laboratories, Indianapolis

² Scientific Section A Ph A, Portland meeting, 1935

of Health, City of Chicago, W Thurber Fales, Director of the Bureau of Vital Statistics, Health Department, City of Baltimore, Thomas J Duffield, Registrar of Records, Department of Health, City of New York, G Arthur Blakeslee, Director of the Bureau of Vital Statistics, Department of Health, City of Detroit, Joseph W Monahan, Deputy Commissioner, Health Department, City of Boston, and to health officers of other cities, for their assistance in giving us the figures for 1934 The figures for New York City as given by Dr Murphy are uniformly lower than those recorded in the office of the Chief Medical Examiner of the City of New York as reported by Gettler and St George (14)

1932 and 1933, respectively There was a similar increase in most large cities during the same period Whether or not it was due to the economic depression is a matter for speculation The mortality rate from cyanide poisoning in urban areas does not appear always to depend upon the size of the population For example, San Francisco with a population of 634,394 (1930 census) has a total number of deaths comparable to that of Chicago, the population of which is 3,376,438 Similarly, Los Angeles has a relatively high death rate from the same cause

SOURCES OF CYANIDE POISONING

- | | | |
|---|--------------|---|
| 1 | Suicidal | |
| 2 | Occupational | { Fumigation of ships and houses to kill vermin
{ Photography
{ Electroplating
{ Gilding
{ Metallurgy |
| 3 | Accidental | { Cyanide compounds
{ Bitter almonds (<i>Amygdalus communis</i>)
{ Arrow grass (<i>Triglochin maritima</i>)
{ Chokecherry (<i>Prunus virginiana</i>)
{ Certain mushrooms (<i>Marasmus</i> , <i>Clitocybe</i>) |
| 4 | Homicidal | |

In general, over 90 per cent of the cases of cyanide poisoning are suicidal in nature Owing to the rigid precautionary measures, death seldom occurs in those places where large quantities of cyanides are handled daily, such as the gold or iron mines, cyanide factories, etc

In the western states, there are several cyanogenetic plants, chiefly the arrow grass and the chokecherry, which have caused annually heavy losses of live stock The following interesting account given by Professor B T Simms, Oregon State Agricultural College, Corvallis, in a private communication to the authors may be cited

"You might be interested to know that this type of poisoning (cyanide) has caused rather serious losses in live stock here in Oregon The common chokecherry has perhaps been the offending plant in the majority of cases One rancher lost 171 sheep during one night last summer from this plant Records show that more than 1500 sheep have died in that one area from chokecherry poisoning during the past four years "

DIAGNOSIS

The diagnosis of cyanide poisoning in men can be easily made if the physician keeps in mind the following points

- 1 Personal history
- 2 Occupational history
- 3 Sudden illness

- 4 Early unconsciousness
- 5 Characteristic odor of breath (smell of 'oil of bitter almonds')
- 6 Rapid and deep respiration in early stages of intoxication
- 7 Convulsions, frequently with involuntary passage of urine and feces These are followed by depression and paralysis
- 8 Cyanosis
- 9 Presence of a cyanide container
- 10 Positive tests for cyanide in the stomach contents or blood

CRUCIAL TESTS IMPORTANT FOR EXPERT TESTIMONY

If a person is poisoned during fumigation, a sample of his blood, 10 to 20 cc, should be drawn. If a person is suspected to have taken poison by mouth, his stomach contents should be evacuated by a stomach tube. If the victim is already dead, the gastric contents should be saved and the liver and kidneys should be removed and analyzed as quickly as possible. It is imperative that the specimens be taken before the body is embalmed. The formaldehyde of embalming fluid reacts quickly with cyanides to form glycollic acid which does not give the chemical reactions characteristic of hydrocyanic acid or its salts. To isolate hydrocyanic acid, the blood, stomach contents or the minced organ, such as the liver or kidney, is definitely acidified with tartaric acid, and subjected to distillation, the poisonous gas being collected in a narrow-mouthed flask. The distillate may be used for various tests.

1 Schonbein's test as modified by Sundberg (1)

Reagents needed Gum guaiac, 0.2 per cent in alcohol, copper sulphate, 0.1 per cent, and tartaric acid.

Procedure Place the suspected fluid in a flask, and acidify with tartaric acid. Wet a strip of filter paper with a mixture of guaiac and copper sulphate in the proportion of 10:3, and suspend it in the flask with a cork. Heat the contents on a water bath.

Interpretation of results A blue color indicates a positive test. The reaction is not specific but very sensitive.

2 Sulphocyanate test

Reagents needed Yellow ammonium sulphide solution, hydrochloric acid, 1 per cent, and ferric chloride, 1 per cent.

Procedure Add to the distillate yellow ammonium sulphide, evaporate the mixture to dryness and dissolve the residue in hydrochloric acid. Warm, filter and add ferric chloride.

Interpretation of results A red color soluble in ether constitutes a positive test. The sensitivity of this reaction is 1:400,000.

3 Prussian blue test

Reagents needed Ferrous sulphate, 1.5 per cent, ferric chloride, 10 per cent, hydrochloric acid, 10 per cent, and sodium hydroxide, 10 per cent.

Procedure Alkalinize the suspected fluid with 2 drops of sodium hydroxide, and add to it 2 cc of ferrous sulphate solution and 1 cc of ferric chloride. Warm the mixture and cautiously acidify with hydrochloric acid but avoid a great excess.

Interpretation of results A blue precipitate indicates the presence of hydrocyanic acid. The sensitivity of this test is 1:50,000.

4 U S P method (quantitative)

Reagents needed Ammonia water, 10 per cent, potassium iodide, *N*/1, and silver nitrate, *N*/20.

Procedure Treat an aliquot portion of 25 cc of the suspected fluid with 4 cc of ammonia water and 3 drops of potassium iodide solution and titrate with *N*/20 silver nitrate until a permanent turbidity of silver iodide appears.

Calculations Each cc of *N*/20 AgNO₃ represents 6.5 mg of KCN, or 7.7 mg of HCN.

Equally simple and accurate is the gravimetric method for the determination of hydro-

cyanic acid This involves the steam distillation of the material acidified with tartaric acid The distillate is received in a beaker containing an excess of AgNO_3 The precipitated AgCN is filtered on a tared Gooch crucible and weighed From the weight of AgCN , the amount of HCN or cyanide salt may be calculated

5 Smith's isopurpurate method (quantitative for small amounts) (2)

Reagents needed Picric acid saturated solution, sodium carbonate 5 per cent hydrochloric acid, 10 per cent, and potassium cyanide, $N/500$

Procedure Into a test tube graduated to 25 cc are pipetted 3 cc of picric acid solution, 1 cc of sodium carbonate solution and 1 cc of the solution to be tested Warm the mixture on a water bath Upon cooling, dilute with water to the mark Compare the reddish brown color in a colorimeter with that of the standard prepared in an identical manner, using 1 cc of $N/500$ KCN

Calculation The total amount in the specimen as KCN in mg =

$$\frac{0.13 \times \text{Reading of Standard} \times \text{Volume in cc}}{\text{Reading of Unknown}}$$

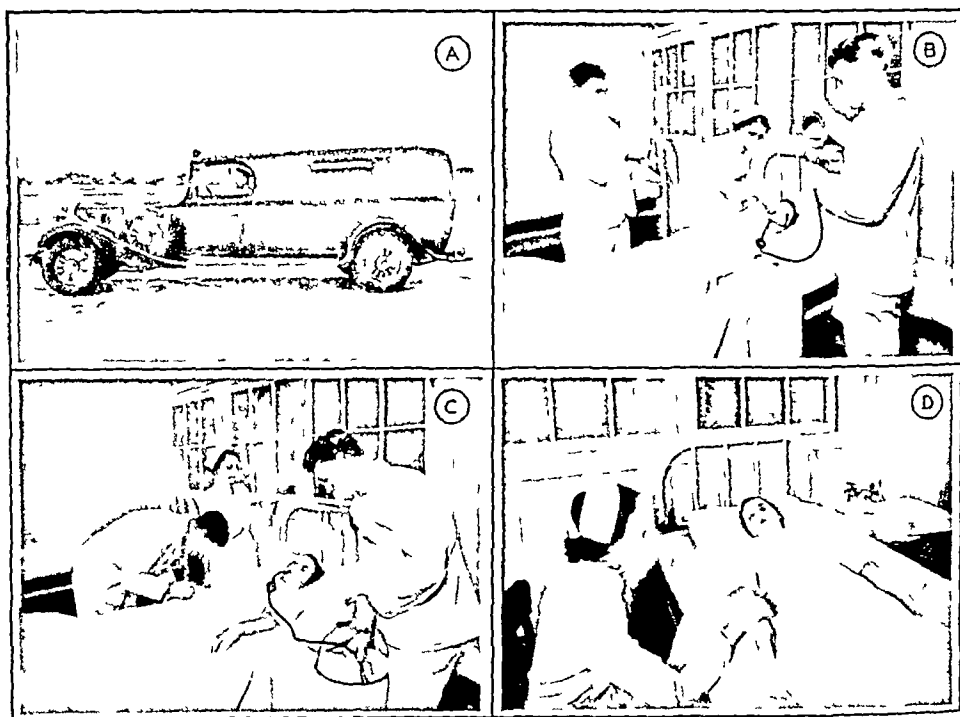


Fig 1 —Suggestion for managing a case of Cyanide Poisoning A The antidote kit should be installed in the ambulance or any place that is most convenient B, C and D Showing steps of administering the treatment

NEW METHOD OF TREATMENT

The method to be advocated depends upon Hug's and the authors' laboratory work previously published (3), (4) The antidote chiefly consists of a combination of sodium nitrite and sodium thiosulphate, injected intravenously one after the other Such a combination can detoxify 20 minimal lethal doses of sodium cyanide in dogs, and is ten times as effective as methylene blue To expedite the treatment,

amyl nitrite is also used by inhalation. The recommended dose for sodium nitrite is 0.3 Gm. in 10 cc. of water (3 per cent), and that for sodium thiosulphate 25 Gm. in 50 cc. of water (50 per cent), although an amount of 12.5 Gm. in the same volume of water (25 per cent) is frequently enough. In cases of relapses, one half of the quantity of each should be repeated. So far, three cases of severe cyanide poisoning have been successfully treated with this procedure—two by Viana, Cagnoli and Cendan (5) and the third by Kempf and Richey (6). All three patients recovered, although they had swallowed large amounts of potassium cyanide. The validity of the laboratory results has therefore been clinically confirmed.

It must be pointed out here that the antidotal action of amyl nitrite against cyanide was first demonstrated by Pedigo (7), that of sodium nitrite by Mladoveanu and Gheorghiu (8), and that of sodium thiosulphate by Lang (9). It is the combination therapy that is of recent development.

In order to make the treatment most effective, it is suggested that a kit containing 12 pearls of amyl nitrite, 2 ampuls of sodium nitrite, 2 ampuls of sodium thiosulphate, 2 sterile syringes, 10 and 50 cc. sizes respectively, 1 file and 1 stomach tube be installed in the ambulance, as is practiced at the Indianapolis City Hospital (Fig. 1A), or in any place where it is most easily accessible. These ampuls have proved to be stable for more than a year with appropriate preservatives and the usual precaution. A team of three individuals is necessary for the best management of a case of cyanide poisoning. In step 1 (Fig. 1B) the physician in charge loads his 10 cc. syringe with sodium nitrite, assistant No. 1 washes out the patient's stomach, and assistant No. 2 initiates the treatment by giving inhalation of amyl nitrite. In step 2 (Fig. 1C), the physician injects sodium nitrite by vein, assistant No. 1 finishes washing the stomach and assistant No. 2 withdraws the amyl nitrite and loads the 50 cc. syringe with sodium thiosulphate. In step 3 the patient should be watched for 24 to 48 hours after the completion of the thiosulphate injection by the physician. If poisoning results from fumigation, gastric lavage is of course not necessary.

The rapidity of death from cyanide poisoning has been justly emphasized in teaching and textbooks, for most patients do die within 30 to 60 minutes. On the other hand, one must also remember that many others may linger for several hours. Doctor G. F. Kempf of the Indianapolis City Hospital showed us the record of a man poisoned with hydrocyanic acid gas in fumigation. The victim did not die instantly but lived a little more than three hours. This happened in 1928. Oxygen therapy and stimulants were the only measures employed. Hanzlik and Richardson (10) adequately state "that clinical cyanide poisoning is not always as rapidly fatal as may be imagined from animal experiments or textbook statements. There is generally considerable cyanosis in man, and symptoms or unconsciousness may be present for two or three hours, which ordinarily will be ample time for administering treatments suggested." The combined therapy with sodium nitrite and sodium thiosulphate has saved dogs even after their respiration has ceased. It is reasonable to assume that this also holds true in men. As long as the victim's heart still beats, the clinician should consider the case hopeful and treat it without delay.

Clawson, Bunyea and Cough (11), (12), (13) conducted numerous experiments in sheep and cattle, and clearly demonstrated that the same method of treatment can be applied to live stock poisoned by cyanogenetic plants.

SUMMARY

This paper is a general but brief résumé of cyanide poisoning. It deals with the mortality statistics, sources of poisoning, the diagnosis, crucial tests for legal pur-

poses, and the treatment The new antidote advocated chiefly consists of a combination of sodium nitrite and sodium thiosulphate Precise instructions as to how a case of cyanide poisoning should be managed are given

The authors are indebted to Dr Clarence W Muchlberger, Cook County Coroner's Toxicologist and Assistant Professor of Toxicology and Pharmacology, Northwestern University Medical School, Chicago to Dr R N Harger Professor of Biochemistry and Toxicology Indiana University Medical School and to Dr Charles L Rouiller, Chemist Edgewood Arsenal, Maryland, for their suggestions and criticisms in the preparation of this manuscript

REFERENCES

- (1) Sundberg T *Svensk Kem Tids*, 33, 112 (1921)
- (2) Smith R G, *J Am Chem Soc*, 51, 1171 (1929)
- (3) Hug, E, *Compt rend soc biol* 114, 87 and 711 (1933), 115, 462 (1934), *Rev soc argent biol*, 9, 91, 197 and 572 (1933), *Prensa med argent*, 20, 1527 (1933), *J A M A*, 102, 552 (1934)
- (4) Chen, K K Rose C L, and Clowes, G H A, *Ibid*, 100, 1920 (1933), *Proc Soc Exptl Biol Med* 31, 250 (1933), *Am J Med Sci*, 188, 767 (1934)
- (5) Viana C, Cagnoli H, and Cendan, J, *Compt rend soc biol*, 115, 1649 (1934)
- (6) Kempf, G F, and Richey, C O, to be published
- (7) Pedigo, L G, *Trans Med Soc Virginia*, 19, 124 (1888)
- (8) Mladoveanu D, and Gheorghiu, P, *Compt rend soc biol*, 102, 164 (1929)
- (9) Lang, S, *Arch exptl Path u Pharmacol*, 36, 75 (1895)
- (10) Hanzlik, P J and Richardson A P, *J A M A*, 102, 1740 (1934)
- (11) Clawson, A B, Bunyea, H, and Cough J F, *J Washington Acad Sci*, 24, 369 (1934)
- (12) Bunyea, H, Cough, J F, and Clawson, A B, *Ibid*, 24, 528 (1934)
- (13) Bunyea, H, *J Am Vet M A* 86 656 (1935)
- (14) Gettler, A O, and St George, A V, *Am J Clin Path*, 4, 429 (1934)

CARBO ACTIVATUS *1

BY JOSEPH ROSIN,² GEO D BEAL³ AND CHESTER R SZALKOWSKI⁴

The demand on the part of the medical profession for a charcoal superior in adsorptive powers to Carbo Ligni U S P X culminated in instructions from the present Sub-committee on Scope to admit a carbon from any source, standardized for its adsorption potency

Decolorizing carbons have, during the past twenty years, assumed a prominent position both in industry and in the chemical laboratory Such carbons have had their decolorizing powers greatly benefited by chemical treatment, and it is likely that such beneficiation received its greatest impulse during the late war in the production of adsorbent carbon for gas mask canisters

* Section on Practical Pharmacy and Dispensing A Ph A, Portland meeting, 1935

¹ Contribution from Merck and Company, Inc, and Mellon Institute of Industrial Research Published by permission of the Chairman, Committee of Revision United States Pharmacopoeia

² Vice-President, Merck and Company, Inc Rahway, N J

³ Assistant Director Mellon Institute of Industrial Research Pittsburgh Pa

⁴ Formerly Assistant in Research in Pure Chemistry Mellon Institute Chemist, Merck & Company, Inc

During the past few years, more thoughtful physicians and pharmacists have experimented with activated carbons for internal medication with a considerable degree of success. Many theories and counter-theories have been evolved, and some have denied that charcoal could have any place in medicine. Clinical experience has triumphed, however, and to-day there is a growing interest in the use of adsorptive agents in medication.

Adsorbent carbons may be produced by the charring of different forms of organic matter. Among these are wood, bone, blood and various industrial wastes. During the past few years one of the most promising has been produced by carbonizing sulphite waste liquor from the pulping of wood for paper. Mere carbonization, as a rule, is not sufficient, so that activation is resorted to, which usually involves some sort of chemical treatment. Mystery surrounds some of these processes, while others are carefully protected by patent, so that a bibliography of activation methods would be out of place here.

Having in mind some of the chemical treatments that have been proposed for activation, we have paid particular attention to chemical impurities in the carbon, and tests for purity have assumed an importance exceeded only by the evaluation of adsorptive properties. Tests for the determination of the purity, *i e*, freedom from toxic or inert substances, are based upon those commonly applied for these same substances, modified in some instances to suit the combination in which these agents may be found. These tests may be quickly summarized as follows:

The loss on drying at 120°C , *i e*, moisture, does not exceed 15 per cent.

The ash, obtained upon ignition in a platinum crucible, does not exceed 4 per cent.

The acid-soluble substance in 1 Gm, found by boiling the carbon with 1 to 4 hydrochloric acid and determining the sulphated ash in the extract, does not exceed 0.035 Gm.

The carbon contains no coloring principles soluble in boiling normal sodium hydroxide.

Upon boiling 3 Gm of carbon with 60 cc of distilled water and filtering, the filtrate is colorless and neutral to litmus, and 10-cc portions of the filtrate contain no more chloride than 1.5 cc of fiftieth-normal hydrochloric acid and no more sulphate than 1 cc of fiftieth-normal sulphuric acid.

The carbon yields no hydrogen sulphide on boiling with hydrochloric acid, nor hydrocyanic acid on distilling with tartaric acid.

A solution prepared by the combined solvent action of diluted hydrochloric acid and bromine water fails to respond to the usual tests for heavy metals.

These tests, however important they may be in demonstrating the harmlessness of the carbon on internal administration, play no part in determining the possible therapeutic efficiency of the material.

The German Pharmacopœia is the only one that to this time has made any determined effort to provide a thoroughly adsorbent carbon. Reliance has been placed in the adsorption of methylene blue and of mercuric chloride. In the first instance it is directed to add 25 cc of methylene blue solution (0.15 Gm in 100 cc of water) to 0.1 Gm of carbon that has been dried at 120°C and finely powdered. It is expected that this volume of solution will be decolorized, so it is directed to add further 5-cc portions of methylene blue until no more decolorization is obtained.

At least 35 cc of methylene blue solution must be required to produce a blue color perceptible after five minutes' shaking. This indicates an adsorption capacity for 0.525 Gm of methylene blue per Gm of carbon.

The requirement of the Swiss Pharmacopœia is that 0.2 Gm of dried adsorbent carbon must decolorize 32 cc of methylene blue solution, of the above concentration, during five minutes' shaking. This amounts to an adsorption capacity for 0.24 Gm of methylene blue per Gm of carbon.

Our first experiences in applying the methylene blue adsorption test to activated carbon were quite unsatisfactory. The finer particles of carbon resist sedimentation, so that we had great difficulty in determining the end-point with any degree of delicacy, due to the obscuring of a faint blue color by the suspended matter. Even when sharp end-points were obtained, the best carbons failed by more than 30 per cent of having the required power of the German Pharmacopœia. This did not seem to be within reason, since these carbons were industrial products treated to enhance their decolorizing properties.

Saturation of the carbon is best obtained by reliance on the mass effect of an excess of dyestuff. Several procedures for the quantitative determination of methylene blue being available, we used our own modification of the iodometric method to determine such an excess after treatment with the carbon. When tenth normal iodine is added to an aqueous solution of methylene blue containing 3 per cent or more of sodium acetate as a buffer a periodide of methylene blue is precipitated, and the consumption of iodine, determined by titration of the filtrate with sodium thiosulphate, is 6 atoms for each molecule of methylene blue.

The method finally decided upon reads as follows:

'Dissolve 0.25 Gm of methylthionine chloride (methylene blue) in enough distilled water to make 250 cc of solution. Measure exactly 50 cc of the solution, at 25° C., into each of two 100 cc glass stoppered flasks. To one flask add exactly 0.25 Gm of Activated Charcoal, stopper the flask and shake vigorously for five minutes. Filter the contents of each flask through a filter which has not been previously moistened, rejecting the first 20 cc of each filtrate. Measure exactly 25 cc of each remaining filtrate into 250 cc volumetric flasks. Add to each flask 50 cc of a solution of sodium acetate (1 in 10) and mix thoroughly, then add from a burette 35 cc of tenth normal iodine, keeping the mixture in constant rotation. Stopper the flasks and allow them to stand for fifty minutes, shaking vigorously at intervals of ten minutes. Dilute each mixture to exactly 250 cc with distilled water, mix thoroughly, allow to stand for ten minutes and filter each through a filter that has not been previously moistened, rejecting the first 30 cc of each filtrate. Determine the excess of iodine in 100 cc of each filtrate by titration with tenth normal sodium thiosulphate. The difference between the two titrations, multiplied by 5, amounts to not less than 3.5."

One cc of tenth-normal iodine is equivalent to 0.005328 Gm of methylthionine chloride. Sixteen samples of carbon, including wood charcoal, sponge charcoal, bone-black and activated carbons, adsorbed methylthionine chloride equivalent to from 0.505 to 4.789 cc of tenth-normal iodine per 0.25 Gm of carbon, corresponding to from 1.08 to 10.02 per cent of the weight of activated carbon. Carbon, in order to satisfy the U. S. P. monograph, must adsorb approximately 7.5 per cent of methylthionine chloride.

The German Pharmacopœia also determines the degree of adsorption of mercuric chloride by activated carbon.

Two tenths Gm of dried and finely sifted carbon is shaken for five minutes with 200 cc of a 0.3 per cent solution of mercuric chloride and then filtered through a previously unmoistened filter, rejecting the first 25 cc. 100 cc of filtrate is then treated with 25 cc of tenth-normal sodium arsenite and 3 Gm of potassium bicarbonate, heating the mixture to boiling for five minutes. After cooling one adds 3 cc of diluted hydrochloric acid and titrates with tenth normal iodine. The titration must require at least 8.8 cc of tenth-normal iodine, so that at most 16.2 cc of tenth-normal sodium arsenite will be consumed in the reduction of the unadsorbed mercuric chloride. The minimum adsorption required is 0.08 Gm of mercuric chloride per 0.1 Gm of carbon.

Careful consideration was given to the mercuric chloride method, and quite satisfactory results were obtained. The determination of the unadsorbed mercury requires a somewhat roundabout procedure, involving the use of two standard solutions, sodium arsenite and iodine, and intermediate boiling and cooling. For these reasons, and because the adsorption of metallic salts is not a normal use of activated carbon, the method was not recommended for adoption by the U. S. P. XI.

With the adsorption of methylene blue representing one type of toxin elimination by the use of activated carbon, a study was made of the use of more definite organic bases as standardizing agents. Several alkaloids were tried for this purpose, but strychnine was selected as the reagent to be used, both because of its rapid and uniform adsorption and because of the availability of positive precipitation reactions for small amounts of strychnine. Directions for the test as adopted for U. S. P. XI are as follows:

"Dissolve 0.1 Gm of strychnine sulphate in 50 cc of distilled water, add 1 Gm of Activated Charcoal, shake the mixture vigorously for five minutes, filter immediately through a dry filter, and reject the first 20 cc of filtrate. The addition of 1 drop of hydrochloric acid and 5 drops of mercuric potassium iodide T. S. to a 10 cc portion of the subsequent filtrate produces no turbidity."

One of the most important uses of activated charcoal is believed to be the adsorption of gaseous products of fermentation or putrefaction. Attempts were first made at the standardization of its adsorptive capacity for carbon dioxide. The method used consisted of passing the gas into an aqueous suspension and determining the gain in weight. Concordant results were not obtained, and it was also believed that the presence of carbonate ash might produce a false adsorptive power. Experiments leading to the measurement of the adsorption of hydrogen sulphide in gaseous form were more promising, and led to the final adoption of a method for U. S. P. XI, reading as follows:

"Into each of two flasks place 185 cc of distilled water and 5 cc of glacial acetic acid and mix thoroughly. By means of a pipette add to each flask 10 cc of a solution of 2.5 Gm of crystallized sodium sulphide in 100 cc of distilled water, placing the tip of the pipette at the bottom of the flask during delivery. Rotate the flask gently for thirty seconds, add to one of the flasks 1 Gm of Activated Charcoal, stopper the flasks and shake them for five minutes. Filter the contents of each flask through a filter that has not been previously moistened, rejecting the first 20 cc of each filtrate. Titrate 100 cc of each subsequent filtrate with tenth normal iodine, using starch T. S. as the indicator. The filtrate from the Activated Charcoal consumes at least 5 cc less of tenth normal iodine than the filtrate from the solution to which no Activated Charcoal was added."

This amounts to a minimum adsorption of 0.01704 Gm of hydrogen sulphide per Gm of charcoal.

A summation of the application of the qualitative and quantitative tests mentioned herein is given in the following table:

TABLE I—RESPONSE OF CHARCOALS TO THE PROPOSED TESTS TO BE INCLUDED IN
U S P XI

Sample	Acids and Alkalies	Cl'	SO ₄ '	S'	Complete Carbonization	Heavy Metals	Ash %	Acid Sol %	Moisture %	Strychnine	H S Cc √10 I	Methylene Blue Cc. √10 I
A*	—	—	—	—	—	—	2 46	1 06	8 13	—	9 10	4 70
B*	—	—	—	—	—	—	1 87	0 70	10 03	—	6 70	4 80
C	—	—	—	—	—	—	3 66	3 22	9 15	—	5 30	3 43
D*	—	—	—	—	—	—	3 46	1 06	8 96	—	5 40	4 46
E	—	—	—	—	+	—	3 81	3 03	3 57	+	3 86	0 66
F	—	—	—	—	—	—	3 24	1 39	3 06	—	5 50	2 83
G	+	+	+	+	+	+	56 2	77 24	3 57	+	5 10	1 16
H	+	+	+	+	+	+	42 1	60 14	3 54	+	4 88	1 41
I	+	—	+	—	+	+	19 57	5 59	4 07	+	4 06	0 91
J	—	—	—	+	+	+	44 93	77 64	4 08	+	4 50	0 51
K	—	—	—	—	—	+	2 9	1 84	4 95	+	4 06	1 41
L	+	+	+	—	+	+	36 61	40 76	4 97	+	5 10	1 52
M	+	—	—	—	+	+	5 08	5 15	5 08	+	3 46	1 67
N	+	—	+	—	—	+	11 31	1 63	1 83	+	3 96	0 60
O*	—	—	—	—	—	—	2 5	2 48	3 55	—	6 70	4 53
P*	—	—	—	—	—	—	3 04	2 68	14 40	—	6 10	4 34

* Conforms to U S P monograph

A—Activated carbon

G—Bone black

L—Sponge charcoal

B—Activated carbon

H—Bone black

M—Willow charcoal

C—Activated carbon

I—Wood charcoal

N—Activated charcoal

D—Activated carbon

J—Animal charcoal

O—Activated charcoal (Willow)

E—Willow charcoal

K—Activated carbon

P—Activated charcoal (Vegetable)

F—Activated carbon



A room in the shrine to the birth of modern botany



The home of Carl Linnaeus and museum

AMERICAN SCIENTIFIC CONGRESS

President Cloyd Heck Marvin of George Washington University, has been named by President Roosevelt to serve as chairman of the delegation from the United States to the seventh American Scientific Congress, to meet in Mexico City September 8th to 17th. Two other Washingtonians, Dr. Neil M. Judd of the United States National Museum and Dr. Francis V. Scholes of the Carnegie Institution of Washington are members of the delegation. Other members are President Wallace Walter Atwood of Clark University, Dr. J. McKeen Cattell, editor of *Science*, President Franklin Stewart Harris of Brigham Young University and Prof. Edward V. Huntington of Harvard University.

ADDRESS OF THE PRESIDENT OF THE AMERICAN
PHARMACEUTICAL ASSOCIATION

BY ROBERT P. FISCHELIS

Ladies and Gentlemen of the American Pharmaceutical Association

The duties of the president as provided for in the By-Laws include the preparation of an address to be presented at the first general session of the annual meeting. It is not specified whether this address shall constitute a report of the activities of the president or of the ASSOCIATION, or whether it shall be upon some other subject deemed pertinent to the occasion. Custom has doubtless influenced the decision of former presidents in this regard and we have had, on occasions like this, a series of forceful expressions of conditions in the practice of pharmacy, records of activities pursued during the presidential year and occasional suggestions and recommendations with respect to future activities. At times these suggestions and recommendations have led to the adoption of new policies and procedures which have left their mark upon American Pharmacy. More frequently, perhaps, the suggestions and recommendations have been received with varying degrees of respectful attention, and have been just as respectfully consigned to the limbo of forgotten things. The eighty-third president therefore enters upon the discharge of this duty with no illusions.



ROBERT P. FISCHELIS

It has always seemed to me somewhat anomalous to have the outgoing president follow the review of activities of his administration with recommendations to be carried out by his successor, when that successor has been elected eight months before taking office and very likely has some ideas of his own as to what should be done. Would it not be more logical for the president-elect to be given an opportunity to submit a program for the ensuing year and have that program passed upon by the convention and then, while president, take the lead in carrying out the approved suggestions rather than to inherit what is left of a program that may be submitted by an outgoing president?

If the president-elect submits the program he is more apt to insist upon its careful and immediate consideration because he has a year ahead of him in which to act. The outgoing president submits his program three days before he leaves office and he knows that whether it is accepted or rejected his official responsibility in connection with it ceases within three days. Unless there is unusual coordination between the outgoing and incoming presidents, it is my judgment that the ASSOCIATION loses a great deal by the present arrangement. The unusual coordination referred to can take place only when the retiring and incoming presidents happen to be so located, geographically, that they can confer frequently. Such a situation is very unusual. I have discussed this matter with various officers of the ASSOCIATION

and there seems to be no objection to the idea of giving the president-elect an opportunity to submit a program at the convention at which he takes office. The only practical difficulty would be presented at the meeting at which the change is to take place. I suggested that I would be willing to give my time this year to the president-elect but it was considered inadvisable by others to inaugurate the plan without approval by the ASSOCIATION. However, we have arranged to give the president-elect such time as he may desire for a message at the final general session of this Convention although this will not allow an opportunity for action upon possible recommendations.

President-elect Costello has wisely pointed out, in connection with this matter, that if the president-elect is to submit his program at the beginning of his administration, we must also make provision for keeping him informed of the work carried on by the organization during the year preceding his incumbency. This would mean that the president-elect should become a member of the Council immediately upon being elected.

ATTITUDE TOWARD THE PRESIDENCY

It is not difficult to imagine several attitudes toward the administration of this office. If it happens to be occupied by one accustomed to administrative duties, he is apt to look upon the presidency of this ASSOCIATION very much as he would upon the presidency of a business enterprise or institutional activity. Under such circumstances the president would expect to make decisions on matters which arise during his term of office, receive reports of other officers and committees and act upon them in accordance with the expressed policy of the ASSOCIATION, or, if there has been no expression of policy, then upon the best advice obtainable and with the exercise of his own judgment. He would expect to take the initiative in promoting the interests of the ASSOCIATION in its recognized sphere of activity and represent the ASSOCIATION publicly where such representation is in order or essential to its progress.

If the presidency is occupied by one who has been elected because of distinguished scientific or professional attainment, and to whom administrative duties are irksome, he is apt to take the position that such duties should be assumed largely by others and he might confine himself to literal compliance with the By-Laws.

Another attitude which may be taken, regardless of the particular attainments of the occupant of the office, is that the general affairs of the ASSOCIATION are of no particular concern to the president after he has appointed certain committees and that his chief function is to preside at the annual convention and act otherwise very much like an ornamental constitutional monarch, being careful of course not to omit "the speech from the throne."

The more one studies the By-Laws of our ASSOCIATION the more it becomes apparent that the presidency was probably not intended to be a position in which forceful leadership should be exercised and that in furtherance of this policy the possible exercise of such leadership has been surrounded by so many barriers as to discourage a man of ordinary initiative.

If the By-Laws provided for the assumption of leadership by some other

officer, it would be a waste of time to make these remarks about the presidency. The fact is that no single officer of our ASSOCIATION is at present designated as the executive officer. It is, therefore, quite natural for the members of our ASSOCIATION and pharmacists, generally, to think of the presidency of the AMERICAN PHARMACEUTICAL ASSOCIATION in terms of leadership and active administration. Accordingly I have tried, within the limits of my ability, to satisfy the demands of the office as it is conceived by the rank and file of pharmacists, by other professions and by the public.

Naturally I have found it impossible to please everybody. I knew in advance how useless it would be to try to please some, but I have tried to keep before me constantly the cherished ideals of those who vision Pharmacy as essentially a profession of service to humanity. If in so doing I have at times incurred the displeasure of those to whom pharmacy is essentially a source of material profit, I am not greatly disturbed. The results of our efforts speak for themselves and in the words of the immortal Lincoln whose statue, housed in that glorious memorial structure, looks down upon our own building in the City of Washington.

"I do the very best I know how, the very best I can, and I mean to keep doing so till the end, if the end brings me out all right, what is said against me won't amount to anything."

ACTIVITIES AND OBJECTIVES

We have had a very busy year. The reports of the other officers and committees will give you detailed information of what has been accomplished and what plans are in store for the future. It would be impossible for me to recount in the time available even the high spots of our many and varied activities. However, I am cognizant of the fact that we are meeting in a section of our Country which we have never visited before as an ASSOCIATION. Therefore it may not be amiss to call attention briefly to the fundamental objectives for which our ASSOCIATION was organized and to devote some time to an appraisal of our present activities in the light of these objectives.

The seven objects of the ASSOCIATION as outlined in its Constitution may be briefly stated as follows:

- 1 To improve and regulate the drug market by preventing importation of inferior, adulterated or deteriorated drugs, and by detecting and exposing home adulterations
- 2 To encourage such relations among pharmacists, physicians and the people at large as may promote the public welfare and tend to mutual strength and advantage
- 3 To improve the science and art of pharmacy by the diffusion of scientific knowledge among pharmacists, stimulating discovery and invention, encouraging home production and manufacture, fostering a pharmaceutical literature and developing inherent talent among its members
- 4 To regulate apprenticeship and employment so as to prevent as far as possible the evils flowing from deficient training in the responsible duties of preparing, dispensing and selling medicines
- 5 To suppress empiricism and to restrict the dispensing and the sale of medicines to educated pharmacists
- 6 To uphold standards of authority in education and in theory and practice of pharmacy

- 7 To create and maintain a code of ethics in keeping with the professional knowledge and function of the pharmacist and designed to protect the public to the highest degree

If we were to start to-day—eighty-three years after the founders—to lay down a platform upon which American Pharmacy might take its place with other health professions, we could hardly conceive of a more inclusive statement of desirable objectives

FOOD AND DRUG LEGISLATION

The first of these objectives has been brought very close to us in the past two or three years because of the endeavor to revise the Federal Food and Drug Act. Pharmacists have been conscious of the need for such revision for many years. The need for some control over the advertising of drugs and medicines by means of radio, newspapers and magazines has become more and more necessary as advertisers have become bolder in their methods and have so far exceeded the bounds of propriety and even decency in their announcements as to call down upon themselves the censure of broadcasting companies and the better class of publications. If truth is important in any field it is so in matters having to do with the public health and especially in expounding the virtues of drugs and medicines.

The proposed food and drug law known as the Copeland bill, which has passed the Senate and is now before the House of Representatives for action, places the control of advertising of foods and drugs in the hands of the Food and Drug Administration. This is as it should be. There has been some agitation to separate the control of advertising from the control of other features governing the manufacture and distribution of drugs and medicines by placing it in charge of the Federal Trade Commission. Such control as is now exercised by the Federal Government over advertising, generally, is in the hands of the Federal Trade Commission. This is so, because this Commission has to do with the control of unfair competition. It has the power to regulate advertising if it involves unfair competition. Thus, if the manufacturer of a brand of aspirin states in his advertising that his product is fresh because of the way in which it is packaged, or that it does not affect the heart, and intimates through his advertising that other brands are not fresh because they are not packed in a certain way, or that they do affect the heart, his competitors may prevail upon the Federal Trade Commission to cite him for unfair competition and to cause him to cease and desist from this practice under penalty of a fine.

The fact that such advertising may have been misleading to the public in so far as therapeutic action is concerned, does not interest the Federal Trade Commission because its function is not to protect the public health, but to protect industry. It would be a calamity if a branch of the Federal Government whose chief function is trade promotion should be entrusted with the control of the advertising of medicines, even though new powers were granted the enforcing agency under the Food and Drug Act. The point of view of a trade promotion bureau and that of a public health agency are so totally different that it is inconceivable that the Congress of the United States should give serious consideration to the pleas of those who would transfer any part of the function having to do with the administration of food and drug laws to a trade agency. I took this position when I appeared before the Senate and House Committees which conducted hearings on the bill.

The necessity for including cosmetics in the regulatory provisions governing the manufacture and distribution of foods and drugs has been apparent for a long time. Pharmacists have known of the danger lurking in the use of certain types of cosmetic preparations and the lack of information available on the label of these products, which have frequently contained poisonous ingredients, has been sufficient to classify many of these products as definitely detrimental to health. This ASSOCIATION is on record as approving the inclusion of the regulation of cosmetics in the Food and Drug Act, and I so informed the Committees of Congress.

The proposed law contains a basic weakness with regard to adulteration. I refer to the so-called "Variation Clause." The bill states that, "No drug shall be deemed to be adulterated under this paragraph because it differs from the standards of strength, quality or purity, therefore set forth in an official compendium, if its standards of strength, quality and purity be plainly stated on its label." Here we have the old policy of *caveat emptor*—let the buyer beware—at its best. Allowing the use of an official name without requiring the product to be of official strength is nullification of the fundamental principle upon which uniformity in drugs and medicines is based. Pharmacopœias were brought into being for the purpose of unifying standards of drugs and the first step toward such unification is an established nomenclature. Tincture Digitalis U S P should mean a product of definite strength from coast to coast. If its standard of strength is not proper let it be changed by the Revision Committee. If several strengths of the tincture are required let them be recognized under official titles but we should not permit the official title to be used for a product that is not of the official strength. The provision of the proposed law which requires only a statement of the standard of strength on a label, if the product differs from the official standard, without indicating how the strength differs from the official standard, opens the door to fraud. This ASSOCIATION is on record against the use of official titles unless products so labeled meet official standards and I so informed the Committees of Congress.

I also took the stand that the request of the Food and Drug Administration for authority to permit unrestricted seizures of shipments of drugs misbranded in such a way as to be grossly deceptive, should be granted. We have been on record for some time in favor of partial formula disclosure. The act provides for partial formula disclosure which is a long step in the right direction, and of course I publicly favored this. The Copeland bill as passed by the Senate and submitted to the House of Representatives is weak in many particulars but as I pointed out in a recent editorial in our own JOURNAL, the time has come to take some definite action so that the element of uncertainty as to future regulation may be removed and the revision of state laws no longer delayed. If enacted in its present form, this proposed law will so vastly improve regulation of the food and drug industries that we are warranted in giving it our approval. It was necessary to spend three days, immediately preceding departure for this meeting, at Washington before the House Subcommittee which has this measure in charge. The outlook for passage of the bill at this session of the Congress appeared favorable.¹ In dealing with the Food and Drug Legislation it has been very gratifying to have the active and effective support of the American Association of Colleges of Pharmacy.

¹ Adjournment of Congress in August left insufficient time for final action on the bill and it was carried over to the next session.

I have dwelled at length on this phase of our activity because it is without doubt one of the most important factors in the progress of pharmacy and it is a question on which the public interest transcends the private interests of those engaged in the manufacture and distribution of drugs and medicines. In my judgment, we have shown the Committees of Congress and the general public that we recognize this. I do not believe that we could have done so by allowing any other organization to speak for us or by having the representatives of our ASSOCIATION speak for other branches of the drug industry. The situation called for a positive attitude toward this great public question. I did not feel that those who were engaged in the controversies arising out of the drastic food and drug legislation originally proposed and who doubtless rendered a great service in clarifying the issue, were in the best position to meet the new situation. Therefore I assumed personal leadership in the matter. I was well aware of the criticism this might arouse in certain quarters, although I did not expect the low type of personal attack indulged in by some. These are matters that can be attended to after I leave the presidential office. I am certain in my own mind that the position I have taken has brought honor and credit to the AMERICAN PHARMACEUTICAL ASSOCIATION in places where honor and credit mean something to American Pharmacy. I hope you will agree with me and if you do, I ask that you endorse what I have done.

PROFESSIONAL AND PUBLIC RELATIONS

Our second objective, having to do with professional and public relations, offers a splendid opportunity for a type of leadership which is sorely needed in American Pharmacy to-day. Most assuredly it is the AMERICAN PHARMACEUTICAL ASSOCIATION which should take the initiative in promoting better relations between pharmacists, physicians, dentists and other health workers and with the public.

I wish to call attention to some of our activities and accomplishments in this direction and point to possibilities for future effective work.

In 1931 the ASSOCIATION authorized the appointment of a Committee on Professional Relations. For some reason unknown to me the committee was never appointed. The need for active cooperation with the medical, dental, nursing and other professions along various lines being apparent, I appointed such a committee this year headed by Leonard A. Seltzer of Detroit with Dean Roland T. Lakey as secretary. An immediate need was felt for a representative from each State to cooperate with this committee. It seems to me that the voting delegate from each State Association to our House of Delegates could furnish the proper contact for this Committee with State groups representing the various professions and I so recommend. We now have a number of State Councils or State Conferences of the Allied Medical Professions actively engaged in the study and consideration of professional and economic problems affecting all professions. In some states these conferences are limited to the health professions. In others they include teachers, lawyers and additional groups. To all such Councils or Conferences we can supply helpful information and guidance on pharmaceutical questions.

It is important that our professional relations be governed by sound thinking, plain speaking and effective action. To this end we should be well informed of the views and opinions of other professional groups. The auxiliary committee of State

Delegates can keep the Committee on Professional Relations informed of developments within the states and it, in turn, should study all proposals involving cooperation between the professions in matters affecting public health, medical care, emergency relief, the use of official drugs and the regulation of the professions, and make such recommendations to the ASSOCIATION as may be indicated

We have endeavored to maintain the most friendly relations with the medical and dental professions. The emergency relief programs of the Federal and State Governments have had a tendency to emphasize the inter-relations of the health professions. The designation of U S P, N F and special formulary non-proprietary drugs for exclusive use in emergency relief prescribing has given an impetus to prescription writing which requires a high type of pharmaceutical practice. This is in the interest of the patient as well as the professions. The efforts of pharmacists all over the United States in meeting the demand for emergency relief prescription service at reduced fees is to be commended and is an indication to the Government and to the public that we can be depended upon to do our part whenever emergencies arise

For a number of years the Council on Pharmacy and Chemistry of the American Medical Association has not had in its membership the same quota of pharmacists originally included in its make-up. We can recall with pride the services of Puckner, Wilbert, Hallberg, Kraemer and perhaps others to this very useful agency. It is probable that the organization of a Council or Committee with similar activities by the AMERICAN PHARMACEUTICAL ASSOCIATION was discouraged because American Pharmacy was given representation on the Council on Pharmacy and Chemistry of the American Medical Association. The present policy seems to be not to replace pharmacists removed from the Council by death, with other qualified pharmacists. It does not seem to me that such a policy will be of benefit to the American Medical Association in the long run and it is hoped that when future vacancies on the Council occur, a pharmacist or two will be named as members so that the very important viewpoint of professional pharmacy will not be eliminated from the deliberations of this all-important and extremely useful Council. An effort should also be made to place a pharmacist or two on the Council on Dental Therapeutics. Here we have points of contact between medicine, dentistry and pharmacy through which a very useful service can be rendered by our profession. They should not be overlooked.

It is unfortunate that our official formularies have not made available to physicians a variety of combinations of active drugs with suitable adjuvants and vehicles such as are furnished under various proprietary names and, of course, at proprietary prices. This situation has led to the preparation of various special formularies promulgated by hospital organizations, State and County medical and pharmaceutical societies and is apt to result in a certain amount of confusion especially if such local formularies multiply. The original objective of the United States Pharmacopœia and National Formulary was to bring about uniformity in standards for drugs and formulas. To avoid the confusion existing before these standard works came into being, they must be kept in step with the progress of the times and supply existing needs by means of frequent supplements. Decennial revision is no longer sufficient to meet existing needs. In this connection a way should be found to supply supplements to the official standards, when issued, di-

rectly to all subscribers to the official books, at no addition to the original cost of the books

Cognizance should also be taken of the recurring agitation as to the constitutionality of the present system of issuing and revising the *United States Pharmacopœia* and *National Formulary*. If there is any doubt about the legality of the present method of revision, we have nearly five years before the next decennial revision in which to obtain Congressional action to authorize issuance of these standards by revision committees called into being by the Congress, if that is necessary. Knowing the slow process by which Congressional action is obtained in these matters, we should not delay our efforts to place the revision of these standards on a firm and sound legal foundation.

Our relations with the public have been enhanced considerably through the completion of the headquarters building in Washington, the continued observance of Pharmacy Week and various public contacts by representatives of the professions with civic and public health groups and through the medium of the public press. Our building in Washington attracts the attention of many visitors to the capitol city and provides a tangible expression of the place of the pharmacist in the progress of scientific medical care.

It was my privilege, as president of our ASSOCIATION, to inaugurate Pharmacy Week last October with a fifteen-minute message from Station WEAJ, Radio City, New York, over a network of the National Broadcasting Company. Reports indicate that the professional window displays made by pharmacists throughout the United States and other features of the observance of Pharmacy Week were of a high order. However, there has been considerable complaint of the manner in which some radio advertisers of drug products have sought to tie up their sales talks with the professional features of Pharmacy Week. Time donated by radio advertisers for purely professional messages during Pharmacy Week constitutes a real contribution to the purpose of this "Week." However, when a purely commercial broadcast is connected with a Pharmacy Week message, it defeats the object of the "Week" which is not to urge people to buy medicines or toilet articles but to be reminded of the professional services rendered by the pharmacist. Radio advertisers who unite their advertising with Pharmacy Week messages are contributing nothing to this movement. On the contrary, they are selfishly taking something away from it.

Throughout the year newspapers, pharmaceutical journals and other publications, including the official journal of the American Association for the Advancement of Science, have carried messages, articles and reports of addresses by your officers and Committee members.

The economic phases of the practice of medicine are occupying the best minds among physicians as well as social workers. Dr. A. C. Christie in his recent book on the "Economic Problems of Medicine" makes the following significant statement: "The doctor entering private practice, finds that medicine is not only a profession, but a business as well." The public is conscious of the fact that there is a business phase to medical care. It has no special interest in regulating the professional phases of medical practice, but it is claiming more and more of a voice in the regulation of its business phases. This development cannot be stopped by ignoring it and the medical profession is finally, although with evident reluctance, making an

effort to meet the situation which has caused the outcry against high costs of medical care. We should watch developments in this field with great care and anticipate probable trends with a constructive program of our own. Such things cannot be developed over night. When the Federal Committee on Economic Security had in process of development what has since become the Social Security Act, we kept in very close touch with the program. State Associations were asked to gather information and transmit it to our Washington office. We were finally informed that the immediate plans of the Government contemplated no application of the insurance principle to the furnishing of drugs and that the per capita expenditure for necessary drugs and medicines does not reach a figure which warrants elimination of the retail pharmacy as a source of supply for drugs under any scheme of socialization of medical services.

Emergency Relief Administrations and other organizations engaged in providing medical care find the many easily accessible pharmacies a convenience in supplying necessary drugs and related items. Hence the agitation for centralized drug dispensaries manifested occasionally in some quarters has made little or no headway.

While there is no justification for the concentration of great numbers of pharmacies or drug stores in centers of population which can be served as well or better by half the number actually available, there is something to be said for a logical distribution of pharmacies so as to maintain suitable and convenient pharmaceutical service to the public. In pharmacy as in medicine and dentistry it is essential that the personal relations between those giving professional services and those receiving them be maintained.

PUBLICATION PROGRAM

Our third objective referring to the diffusion of scientific knowledge and fostering pharmaceutical literature is being cared for through our JOURNAL, the National Formulary, the Recipe Book, occasional bulletins and special publications issued from time to time.

In my correspondence with the membership and in my personal contacts with them, I have gained the distinct impression that our present JOURNAL does not meet the needs of the average pharmacist in a number of particulars. There is also some dissatisfaction on the part of those wishing to use the JOURNAL as a medium for the publication of lengthy scientific papers. The mere statement of these facts is sufficient to call attention to the difficult problem faced by the Editor. The ASSOCIATION is on record in favor of establishing a second monthly publication designed to interest and serve the retail pharmacist. This matter has had very careful consideration in the Council and it is believed that the interests of the ASSOCIATION will be served best if the present JOURNAL is gradually converted into an exclusively scientific publication carrying the monthly abstracts of pharmaceutical literature, papers of sufficient scientific value to warrant giving them a permanent place in the literature and editorials relating to the development of professional pharmacy. American pharmacy needs such a publication. The general information now carried in the JOURNAL, together with articles of special interest to pharmacists operating retail establishments or prescription shops and editorials relating to the general objectives of the ASSOCIATION and defining its policies would be published in the new JOURNAL. Thus the ASSOCIATION would fill a long-felt need in bringing its activities closer to the average retailer.

With the publication of the 1934 YEAR BOOK this series of volumes reporting the progress of pharmacy will come to an end in accordance with the action taken by the ASSOCIATION some time ago. In place of the annual publication of abstracts in the YEAR BOOK, monthly instalments of these abstracts will appear in the JOURNAL. This improved service to the members of the ASSOCIATION has been in effect since March of this year. Editor DuMez and his collaborators are to be commended for the promptness with which abstracts of pharmaceutical literature are now reaching us, and Editor Eberle has made arrangements to segregate the abstracts in the JOURNAL in such a manner as to make them available for separate binding at the end of the year if that is desired. Many of us will miss the annual YEAR BOOKS even as many others of a previous generation missed the annual volume of Proceedings, but the needs of the day are such as to require prompt publication of proceedings, abstracts and other material, and to this end monthly publication is much more serviceable. Further reference to the publication program will be made in another part of this address.

PRACTICAL TRAINING

Our fourth objective bearing upon proper conditions of apprenticeship and employment so as to prevent the evils flowing from deficient training in responsible duties in preparing and selling medicine is, at this time, of deep concern to the profession. The advent of the four-year course in pharmacy has focused attention upon the necessity for the revision of the practical experience requirement. I do not intend to recommend any specific method of providing the practical training which all pharmacists need before entering upon their profession. Nor do I intend to condemn any method which has been proposed for providing necessary practical training in advance of a trial of the method. I believe that practicing pharmacists have a certain responsibility in connection with the matter. Colleges of Pharmacy are concerned in so far as the coordination of their courses with the practical experience requirement is essential. The problem is of chief concern to the Boards of Pharmacy which are responsible to the public. It is to be hoped that the Boards will rise to their responsibility in this and other matters. We have in the United States, forty-eight states which are also forty-eight laboratories in which we should be permitted to do some experimenting. To arbitrarily attempt to stifle the initiative of any state in this matter is not rendering a service to pharmacy. Fortunately, we have Boards of Pharmacy which are willing to do pioneer work in this field. They should be encouraged in their attempt to find solutions to our problems.

DRUG DISPENSING RESTRICTED TO PHARMACISTS

Our fifth objective refers to restriction of the dispensing and sale of medicines to pharmacists. We have made many attempts by legislation to attain this objective. In spite of the fact that it is entirely logical, and in the interest of the public health and welfare, to require that all drugs and medicine shall be dispensed under the supervision of registered pharmacists, we have not been able in eighty-three years to come as close to this objective as the public interest demands. The tendency on the part of pharmacists, is to condemn legislators for failure to so revise pharmaceutical laws as to give the public this necessary protection. The fact

is that the members of our own industry are probably more responsible for our failure to reach this objective. I am not basing this statement on guess-work. It is perfectly apparent to anyone who has had legislative experience that manufacturing interests invariably block state legislation which tends to restrict the sale of drugs and medicines to registered pharmacists.

At the 1934 meeting of the National Drug Trade Conference, I presented a resolution asking the conference to go on record in favor of restricting the sale of drugs to drug stores. The resolution was referred to a committee consisting of one member from each of the eight associations participating in this meeting. They represented the three drug manufacturing associations, one wholesale association, our ASSOCIATION, the National Association of Retail Druggists and the association of colleges and association of boards. The committee voted five to three in favor of the resolution. The three negative votes were cast by the three associations of manufacturers. Undoubtedly, there are among the better class of drug manufacturers, some who would be willing to see their products marketed exclusively through the drug store. However, as a class they do not desire to restrict distribution of their products to registered pharmacists. How can we expect legislators and laymen to support the principle that all drugs should be supplied under the supervision of registered pharmacists if members of the drug industry are opposed to such a procedure? It is necessary for us as the professional association of pharmacy to educate members of our own industry on this question. With the increasing amount of radio and magazine advertising of packaged drugs, it is not difficult to visualize the possibility that pharmacists may be eliminated as important factors in the distribution of drugs and medicines. That may not be the immediate objective of drug manufacturers, but it is conceivable that if their volume of sales can be increased through other channels of distribution, some of them will not hesitate to use these channels to a greater degree and others will follow if the plan is successful. The medical profession is just as deeply concerned in this situation as we are. It is not a far cry from general distribution of drugs and medicines through non-professional outlets, by means of modern advertising facilities to the diagnosis and treatment of disease by the same methods. As a matter of fact, it has been done and is being done. In self defense as well as in the public interest, the professions should endeavor to curb this trend.

PHARMACEUTICAL EDUCATION AND PRACTICE

Our sixth objective has to do with upholding standards of education and standards of pharmaceutical practice. We have made rapid though belated strides in the improvement of the education of pharmacists. The delay has unquestionably been due to lack of interest and initiative of pharmacists themselves in improving their system of formal education. The American Medical Association realized much earlier than did we, the necessity for a high standard of culture and professional attainment in order to maintain the dignity and leading position which medical men occupy. The AMERICAN PHARMACEUTICAL ASSOCIATION, as an association, has not taken the direct interest in promoting higher educational standards for pharmacists which it rightfully should have taken in its position as spokesman for American Pharmacy. It is somewhat late to offer a program now. However, it is not too

late to express complete approval of the present trend in pharmaceutical education toward a cultural background for the necessary technical training required of prospective pharmacists and to urge adherence to the four-year course as a minimum requirement for undergraduate study. It is also important to emphasize that leadership in pharmaceutical education should be retained by pharmacists. The American Association of Colleges of Pharmacy was organized to promote the interests of pharmaceutical education but it is composed only of faculties connected with institutions that teach pharmacy. It is an organization which serves the profession in a specialized field. It does not and cannot speak for American pharmacy as a whole. Its function is to provide for the proper administration and teaching of pharmacy courses. In this function it should have the active support of the AMERICAN PHARMACEUTICAL ASSOCIATION and beyond this, it is certainly the duty of the AMERICAN PHARMACEUTICAL ASSOCIATION to see that the colleges of pharmacy of the United States meet an adequate standard, that they are adequately financed, and that they limit their output to the number which can be absorbed by the industry and the profession.

In addition to this responsibility, the AMERICAN PHARMACEUTICAL ASSOCIATION should assume some responsibility for the continuance of the education of those who are actively engaged in the practice of pharmacy. This can be done by planning for extension courses in cooperation with schools of pharmacy and schools of medicine. A start in this direction should be made even if the response, at first, is not too gratifying.

The proposal to organize a Council on Pharmaceutical Practice under the ægis of the AMERICAN PHARMACEUTICAL ASSOCIATION has been approved and a committee headed by Professor Cook has been actively engaged in formulating plans for setting up such a Council. Time has been set aside at one of our general sessions for the presentation of the report of this Committee and a discussion of its plans. It should be understood that the AMERICAN PHARMACEUTICAL ASSOCIATION is not arbitrarily setting itself up as an agency to classify pharmacies or drug stores. However, it is taking cognizance of the fact that pharmaceutical practice may be supplied with varying degrees of expertness and efficiency. It is, therefore, supporting a plan designed to set up minimum standards of acceptable practice for pharmaceutical work in manufacturing plants, in hospitals, in prescription pharmacies and in various governmental or private institutions. In order that the public may benefit to the fullest extent from such plans it seems desirable to indicate in some manner who is qualified to render the specialized services for which minimum standards are to be set. It is recognized that a certificate to practice a profession issued by a commonwealth does not necessarily indicate great proficiency on the part of the holder of the certificate. It is at best merely a protection against gross incompetence by guaranteeing that the licensee has met certain minimum standards and passed a prescribed test of fitness which does not always measure fitness satisfactorily. Hence it seems desirable to follow the trend in medicine, which is now so pronounced, of creating boards of experts in given fields, which examine the qualifications of those who desire to practice as specialists and certify that they are really qualified by training and experience to act as such.

Our seventh objective refers to the code of ethics and need not be commented on here for it is well known to pharmacists everywhere. It may not be out of

place to suggest that Boards of Pharmacy require newly registered pharmacists to sign this code of ethics as a part of the registration requirement as is done in New Jersey

MEMBERSHIP PROBLEMS AND PLANS

You heard in the report of Secretary Kelly to the House of Delegates yesterday, that our active personal membership numbers only about three thousand. In spite of a lack of personal participation in its activities, the pharmacists of the United States have looked up to the AMERICAN PHARMACEUTICAL ASSOCIATION as the personification of everything they would like pharmacy to represent in its highest and most professional sense. Practically all of them are ready to point with pride to what the AMERICAN PHARMACEUTICAL ASSOCIATION represents. This was true before there was a building in Washington, before there was a full-time Secretary and even before the organization embarked on the venture of publishing a monthly journal. It was one of those things that is just taken for granted. In other words, the AMERICAN PHARMACEUTICAL ASSOCIATION has for more than four score years been a symbol in the minds of the average pharmacists who never expected to get very close to the ASSOCIATION and who were never directly approached by the ASSOCIATION, but who nevertheless sensed the lofty purposes which prompted its organization and have benefited by the activities of individuals affiliated with the ASSOCIATION and acting for the ASSOCIATION on occasions when professional pharmacy was called upon to take part in national affairs having to do with the compounding and dispensing of medicines or the rendering of services commonly described as pharmaceutical. But I raise the question, "Shall the AMERICAN PHARMACEUTICAL ASSOCIATION remain a symbol or shall it become a living thing to all pharmacists?" I am convinced after an experience of nearly twenty-five years, that American Pharmacy needs concerted national direction more than it needs anything else to-day. It is my further conviction that it is absolutely unnecessary to go outside of existing set-ups to provide this concerted action and national leadership. In fact it has been definitely shown that such organizations as the National Drug Trade Conference and the Drug Institute which were organized to provide for the expression of a composite view on behalf of all elements in the drug industry, have failed to accomplish that purpose. I believe that the only way in which the divergent interests of the various elements of the drug industry can be harmonized to the extent required on questions of professional and trade interest is by the meeting of representatives of those elements on the same level and that means meeting as pharmacists with the welfare of pharmacy in mind. When we meet as pharmacists, we have something in common. When we send our attorneys to meet each other, it is notice to the world that we are endeavoring to obtain the best deal possible for our private interests. Let us solve the problems of American Pharmacy by meeting as pharmacists in the AMERICAN PHARMACEUTICAL ASSOCIATION. There are some who would profit by retaining the American Pharmaceutical Association as a symbol and building it up as a professional veneer for the drug industry. We must guard against any such eventuality.

In an address last January,¹ I covered the membership problem in detail and I desire to quote the following from this address

¹ *Druggists Circular* January 1935 page 28

"The AMERICAN PHARMACEUTICAL ASSOCIATION is the all-inclusive organization of pharmacists. It can include in its membership every member of the manufacturing, wholesale, retail, teaching and law enforcement associations. Using the state associations as a basis, it can include every retail pharmacist affiliated with such associations. It is fortunate that such an all-inclusive membership is possible to-day without upsetting or injuring any other national association. By the simple expedient of bringing every state association member into the fold of the AMERICAN PHARMACEUTICAL ASSOCIATION and the National Association of Retail Druggists through the payment of one fee for membership in the state associations, and by the medium of a small per capita tax collected from other national associations, a majority of the retail, wholesale and manufacturing groups can be brought into the AMERICAN PHARMACEUTICAL ASSOCIATION and make it the spokesman for American Pharmacy on matters of general professional and economic concern. The membership fee under such an arrangement will be nominal. The publications of the ASSOCIATION, with so wide a distribution of readers, will bring in revenue, and there will be an end to the demand for new associations and the solicitation of funds with which to do what we should now be doing. Furthermore—and this is of the greatest importance—when the ASSOCIATION becomes representative of the majority of practicing pharmacists, its power of moral suasion will be great enough to make many demands for laws to control trade practices unnecessary. We can only have industrial and professional self-government when we represent the profession and the industry by the consent of the majority.

"If we are ever to adjust the output of pharmacists to normal demands, if we are ever to obtain satisfactory legislation for the control of the quality and sale of drugs and medicines, and if we are ever to establish uniform requirements for licensure and improve the professional and economic status of the pharmacist, we must operate as a unit. With a majority of pharmacists in the various branches of the profession united through membership in the AMERICAN PHARMACEUTICAL ASSOCIATION, our Code of Ethics will take on a new significance. Membership in the AMERICAN PHARMACEUTICAL ASSOCIATION will be a badge of distinction to be taken from anyone who fails to live up to the Code of Ethics and the principles of Fair Play.

"To take care of the present membership, which is, to a degree selective, there may be organized within the ASSOCIATION a body to be known as the 'American Institute of Pharmacy,' the members of which would be designated as 'Fellows.' In this way a new significance would be given to the title 'American Institute of Pharmacy,' which is now nothing more than the name on a building belonging to the AMERICAN PHARMACEUTICAL ASSOCIATION. To become a Fellow of the American Institute of Pharmacy one would first have to be a member of the AMERICAN PHARMACEUTICAL ASSOCIATION for a period of years to be determined, and he would have to present qualifications entitling him to fellowship. We have the same arrangement in the American Association for the Advancement of Science and the American Public Health Association. It is to be expected that fellowship dues will be higher than membership dues in the AMERICAN PHARMACEUTICAL ASSOCIATION. The Fellows of the American Institute of Pharmacy by virtue of their membership will be recognized as outstanding individuals in their field. They may have specialized in prescription practice, in teaching, in law enforcement work, in manufac-

turing pharmacy or in research This will assure the presence within the AMERICAN PHARMACEUTICAL ASSOCIATION of a group of highly qualified pharmacists to whom should be assigned committee appointments and the elective offices of the ASSOCIATION Since any pharmacist who is able to qualify as an expert in some phase of pharmaceutical practice would be eligible to fellowship in the Institute, no unjust discrimination can be charged, and representation of the ASSOCIATION by highly qualified individuals will be assured "

It is advisable to await action of the Joint Committee on cooperation of the AMERICAN PHARMACEUTICAL ASSOCIATION and National Association of Retail Druggists with State Associations and the launching of our new JOURNAL before taking any definite action on this plan My recommendations on the subject are made with this development in mind

REORGANIZATION OF THE COUNCIL

The Council of the ASSOCIATION is the executive body and, under present conditions is more responsible for the activities of the ASSOCIATION than any individual officer It is now composed of seventeen members, nine of which are elected by members of the ASSOCIATION The balance are officers of the ASSOCIATION This is an unwieldy body for the transaction of business either personally or by mail Some years ago we substituted for the Council, a board of directors composed of nine members This was a much more satisfactory group and the only reason for changing back to the larger number was to satisfy an apparent requirement of the Charter of the ASSOCIATION I have studied the Charter and I see nothing in its wording which would require the Council to consist of seventeen members I recommend that the By-Laws be amended to reduce membership of the Council to six elected members and three ex-officio members, namely, the president, the president-elect and the chairman of the House of Delegates The six elected members should be distributed geographically in accordance with the concentration of membership The Council should have its own secretary and should be required to meet at least three times a year, one meeting to be held in connection with the annual Convention, one meeting in the fall of the year, and one meeting in the spring It should be required that the permanent officers of the ASSOCIATION make quarterly reports to the Council and it would be expected, of course, that the Secretary of the ASSOCIATION and such other officers as the Council deems necessary, be asked to attend the meetings which should all be held at the headquarters building in Washington

The recommendation that the Council should be small is in line with good administration as followed by other efficient national organizations The provision that the Council should have its own secretary is likewise in line with good administration and goes back to the policy formerly followed by this ASSOCIATION It seems that when we decided to elect a full-time secretary, we were afraid that he would not have enough to occupy his time, so we made him Secretary of the ASSOCIATION with the work incident thereto at the general sessions of the Convention, we then made him Secretary of the House of Delegates with the tremendous amount of detail that entails at the annual convention and then we topped it off by making him Secretary of the Council so as to be sure that he would have no spare moments, either night or day, during the Convention week I believe that when we expect our permanent secretary to act at the general sessions, and as Secretary to the House of Delegates,

we have given him more than enough of a load to carry at these Conventions The duties of the Secretary of the Council would not be sufficiently arduous at any time to call for anything more than nominal expense for clerical help and other services

ACTIVITIES OF STANDING AND SPECIAL COMMITTEES

The standing and special committees of the ASSOCIATION have been active in their various spheres and will have some very interesting reports to make I wish that I could take the time to give a more detailed résumé of the work of all Committees for it represents a true picture of the many and varied activities in which our ASSOCIATION is engaged However, a mere reference to the more important activities must suffice at this time New members and those who have not followed the work of the AMERICAN PHARMACEUTICAL ASSOCIATION very carefully in recent years will be amazed at the scope and variety of activities covered if they will look over the titles of the many committees we have at work and read the valuable information contained in their annual reports The following brief comment on Committee activities may be of interest at this time The Committee on Local Branches, under Dean Ziesle, has made a very careful survey of the Local Branch situation and will have some recommendations to make I asked the Local Branches to communicate with me at the end of their fiscal year, setting forth a review of their activities and supplying information about their programs which might be helpful to the future plans of other branches The response to this request was very gratifying and this information has been turned over to the committee There seems to be a very live interest in some of our schools of pharmacy in the Student Branches I hope that this interest can be fostered I believe that some arrangement should be made to rebate a small portion of the annual dues of members of the AMERICAN PHARMACEUTICAL ASSOCIATION who are members of Local Branches, to the Local Branches This would aid the collection of dues for both the parent organization and the branches

The Committee on Pharmaceutical Research headed by Dr Army has continued its activities in promoting and supplying financial assistance for outstanding research projects

The Committee on Proprietary Medicines has not been very active in recent years It could render a very useful service to the profession by organizing a service for pharmacists which would make available information with regard to the composition, standards, classification and ethical status of proprietary medicines Certainly retail pharmacists should have as much information about proprietary preparations as is now furnished by organizations serving various groups of consumers While it is not the function of pharmacists to diagnose or treat disease, they are expected to have full information about the drugs and medicines which they are called upon to dispense With an authentic source of information on this subject available, the professional status of the pharmacist will be enhanced and service to the public will be greatly augmented

A similar service can be rendered the pharmacist in connection with cosmetics Here is a virgin field There is no Council on Cosmetic Preparations serving in the capacity of the Council on Pharmacy and Chemistry or the Council on Dental Therapeutics Our Committee on Cosmetics has this matter in mind and could render a splendid service to the pharmacists of the United States as well as the

public by arranging for the collection and distribution of information on the composition and claims made for cosmetic products

The Committee on the Study of Pharmacy has made a number of contacts with foundations interested in education and in the problems of medical care. It is often stated that a complete survey of pharmacy and the activities of pharmacists is necessary in order to supply the background for departures from existing methods of supplying drugs and medicines. The fact is that a number of excellent surveys have been made and are available in published form. The Charters' Report, the Reports of the Committee on the Costs of Medical Care, the St. Louis Survey and other surveys of the Department of Commerce are all replete with facts and figures concerning the practice of pharmacy and in some instances these reports contain recommendations for the improvement and enlargement of pharmaceutical activities which, if carried out, would be of considerable assistance in placing the practice of pharmacy upon a more satisfactory basis. We should make greater use of information contained in these surveys. At the same time, a complete study of the present situation will undoubtedly prove most helpful at this time and the Committee on the Study of Pharmacy should continue its efforts in this direction.

The Committee on U. S. Pharmacopœia, under the chairmanship of Professor Glover, has been somewhat regenerated during the past year. It is a standing committee of the ASSOCIATION and its functions are to collect statistics regarding the frequency with which official and non-official remedies are used in legitimate practice and to ascertain the general wishes and requirements of the profession throughout the country in regard to any desired changes or improvements in the Pharmacopœia. It has other duties but the foregoing are of paramount importance, particularly in view of the coming revision of the U. S. Pharmacopœia. It seems advisable that membership on this Committee should be restricted to those who are not also members of the U. S. P. Revision Committee.

The Committee on Prescription Tolerances, headed by Dr. Schaefer, has done very valuable work in determining the limits of possible accuracy in the extemporaneous compounding of prescriptions. It is very essential that this work be continued and extended.

The Committee on Weights and Measures, under the chairmanship of President-Elect Costello, has continued to assemble information on the accuracy of weighing and measuring devices in retail drug stores, and in this connection it is pertinent to point out that in states where strict supervision over weights and measures is maintained, the apparatus and equipment are found to be in good condition.

The Committee on Physiological Testing, under the chairmanship of Dr. Munch, has continued its work on the deterioration of digitals, and in the course of time the experiments reported by this Committee over a period of years should prove of considerable value in estimating the rate of deterioration of biologically assayed drugs.

The Committee on Pharmacy Corps in the U. S. Army, under the chairmanship of Dean Kendig, has energetically pursued the objective of the ASSOCIATION to secure commissioned rank for pharmacists in the Army. The report of this Committee will show that considerable progress has been made. Several conferences were held with Surgeon General Patterson and members of his staff during the past year,

and on one occasion the pharmacies at two Army posts were visited. It appears quite certain that in the near future suitable commissioned rank will be provided for pharmacists whose education has been of the same character as that of other professional groups now enjoying commissioned rank in the Army.

The Committee on Horticultural Nomenclature under the chairmanship of Professor Youngken has been active in making classifications which will assist in the identification of various drug plants.

The Committees on Legislation, Pharmacy Week, Press Relations, Transportation and Code Matters have all functioned in their respective fields and some of their work has already been referred to in other parts of this address.

The Committees on Pharmaceutical Syllabus, International Pharmaceutical Nomenclature and Prerequisite Legislation have likewise functioned in their respective fields, although in the majority of instances their principal activities have been completed for the time being.

The Maintenance Committee for the Headquarters Building has obtained a number of new subscriptions to the Building Fund, and subscriptions totaling \$132,036 00 to the Maintenance Fund. Of the latter amount \$50,000 00 represents a bequest to be paid at a later date, and of the remaining \$82,036 00, the sum of \$64,436 00 has been paid. This has enabled the ASSOCIATION to complete payment of all indebtedness on the building and property with the exception of a mortgage of \$36,400 00 on the lot in the rear of the building, which is amply covered by the bequest of \$50,000 00 previously mentioned. The building has recently been exempted from taxes because of the educational and non-profit nature of the activities carried on by the ASSOCIATION.

A variety of gifts have been made to the headquarters building in addition to the contributions toward the Maintenance Fund, and these are covered in detail in the report of Chairman Dunning of the Maintenance Committee. Our continued thanks are due Chairman Dunning for his untiring efforts in this connection.

The Committee on William Procter Jr. Memorial Fund under Chairman Hancock has made excellent progress toward the preparation and erection of the monument in the headquarters building, and we may look forward to the dedication of the monument in the near future.

Dr. John C. Krantz and Professor Gustave Bachman are to be congratulated on the fine program which they arranged in behalf of Pharmacy at the recent meeting of the American Association for the Advancement of Science. The establishment of a section devoted to pharmacy within this national association is an indication of the progress scientific pharmacy is making.

During the past year we have also had at work Committees on State and National Code Matters, on the Study of Pharmacy Laws and on the Drafting of an Act to Restrict Distribution of Drugs and Medicines to Pharmacists. The latter two Committees should be continued and encouraged in their efforts toward finding a solution for some of the most perplexing problems relating to pharmacy law enforcement. They are headed by Dr. Robert L. Swan and Mr. W. Bruce Philip, respectively. In making a study of Pharmacy laws it has seemed to me to be advisable to enlist the cooperation of the American Bar Association and its Commission on uniform State laws. I am pleased to be able to report that correspondence with

the officers of the Bar Association indicates an interest in our problem of seeking greater uniformity in State pharmacy laws. It is suggested that the Committee correspond further with the American Bar Association.

The Committee on National Formulary and the Committee on Recipe Book have both been busily engaged in the revisions of these respective volumes. Dr Lascoff as chairman of the Committee on Recipe Book, with the assistance of Mrs Elsie Kassner, who was selected as editor, and the other members of the Committee, has practically completed the revision of the Recipe Book, and I feel sure that the second edition of this important and valuable volume will meet with general approval. The new edition of the National Formulary is nearing completion and will be an outstanding work in its particular field.

I cannot allow the opportunity to pass without paying a tribute to the diligence and effective work of the committee which is revising the National Formulary. Professor Gathercoal has brought to the chairmanship of the committee a type of leadership in which American Pharmacy and the AMERICAN PHARMACEUTICAL ASSOCIATION can take just pride. His sane approach to the problems of the revision, the scientific thoroughness which has characterized the preparation of the monographs and withal the great patience and willingness to seek and accept advice which have been displayed throughout the revision, call for our most profound admiration and thanks.

To Editor Eberle, I wish to express my thanks for cooperation extended throughout the year.

To Dr Kelly whose very difficult and trying position as Secretary of an ASSOCIATION, which is endeavoring to be helpful to the divergent interests within the drug industry, requires great patience, tact and capacity, and who possesses all these attributes to an unusual degree, I likewise desire to express my gratitude. We have not always agreed on methods but I doubt whether there has ever been a disagreement between us as to the position which the AMERICAN PHARMACEUTICAL ASSOCIATION should take on matters of fundamental importance. As officers of the ASSOCIATION, we have had to place our own interpretation on matters regarding which the ASSOCIATION and Council failed to give definite instructions. There has been no difficulty in harmonizing our views or stating our respective positions on such matters because they were approached with the interests of American Pharmacy and the AMERICAN PHARMACEUTICAL ASSOCIATION at heart. Such recommendations as I have made with respect to the secretaryship are intended to clarify and assert an association policy on the subject and to give to the office that responsibility which the proper exercise of its duties demand.

To all others whose advice, counsel and cooperation I have had throughout the year, I express my sincere appreciation and thanks, and finally, I thank the members of the ASSOCIATION for the opportunity that has been given me to serve in this high office.

RECOMMENDATIONS

Recommendation No 1—It is recommended that it shall be the policy of the AMERICAN PHARMACEUTICAL ASSOCIATION to require its full time officers to confine their pharmaceutical activities to the affairs of the ASSOCIATION. This is not to be interpreted as an abridgment of the privilege to take part in related affairs in the capacity of advisor, committeeman or delegate.

It is, however, to be interpreted as abridging the privilege of serving in a secretarial or managerial capacity to any other organization or group or to act as the spokesman or representative of any other organization or group within the sphere of pharmaceutical activity unless permission to do so is specifically granted by the Council

Recommendation No 2—It is recommended that the secretary of the ASSOCIATION be also designated as general manager and that this title shall carry with it executive supervision of and responsibility for the activities of the ASSOCIATION in the headquarters building

Recommendation No 3—It is recommended that it shall be the policy of the AMERICAN PHARMACEUTICAL ASSOCIATION to work actively toward a unification of pharmacal forces within the United States and that the immediate steps to be taken in this direction shall be the fostering of an intimate contact with the State Pharmaceutical Associations and with the National Association of Retail Druggists to the end that membership in state Pharmaceutical Associations shall eventually carry with it a personal affiliation of every State Association member with the A P H A and the N A R D

Recommendation No 4—It is recommended that it shall be the policy of the AMERICAN PHARMACEUTICAL ASSOCIATION to assume active responsibility for the general direction of pharmaceutical affairs in the United States This is not to be interpreted as an effort to duplicate the activities of any organization now functioning in a specific field such as education, licensure manufacturing wholesaling or retailing It is however, to be interpreted as an offer of cooperation from the representatives of the profession at large with respect to the formulation of policies affecting pharmacy as a whole and as an expression of the intent to assume leadership in those matters which are national in their scope and which affect the relations of pharmacists to other professions the relations of pharmacists to each other and the relations of pharmacists to the public

Recommendation No 5—It is recommended that the president elect be made an ex officio member of the Council immediately following his election and that the procedure at the annual convention be so arranged as to give the president elect an opportunity to submit recommendations in time for approval at the meeting at which he takes office

Recommendation No 6—It is recommended that the office of Librarian and Curator of the Museum be created as soon as possible as a full time office

Recommendation No 7—It is recommended that the contents of the JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION be confined to scientific and professional papers of permanent value or significance, to the monthly abstracts of pharmaceutical literature and to editorials dealing with scientific and professional matters It is further recommended that as soon as this change can be brought about, the material of general interest now appearing in the JOURNAL together with helpful papers and articles on professional and economic subjects be issued in the form of a new monthly publication directed particularly to the retail pharmacists of the United States It is further recommended that this publication carry no advertising

Recommendation No 8—It is recommended that the new Journal referred to in the preceding recommendation be mailed to the members of all State Pharmaceutical Associations upon payment of a small per capita tax by the respective State Associations and that it be issued with the cooperation of the N A R D if the plans for unification and coordination of the activities of State Associations and the two National Associations now under discussion are consummated

Recommendation No 9—It is recommended that the cooperation of the AMERICAN PHARMACEUTICAL ASSOCIATION be extended to Boards of Pharmacy in their efforts to establish adequate standards for the practical training of pharmacists especially in cases where departures from established customs are contemplated and that the results of any survey or study which the ASSOCIATION may make in connection with the formulation of standards for practical experience, be made available to the Boards

Recommendation No 10—It is recommended that the dangers of the distribution of drugs and medicines without the supervision of pharmacists be called to the attention of the American Medical Association and Medical Societies of various states with the request that they join the AMERICAN PHARMACEUTICAL ASSOCIATION in an aggressive effort to persuade drug manufacturers to limit distribution of their drug products to registered pharmacists

Recommendation No 11—It is recommended that the Council on Pharmaceutical Practice give consideration to certification of specialists in the fields of hospital pharmacy manufacturing

pharmacy and prescription pharmacy, by the establishment of boards of experts for such certification

Recommendation No 12—It is recommended that the committee on study of pharmacy be instructed to explore the possibilities of extension courses for practicing pharmacists to the end that formal lectures and demonstrations in connection with newer materia medica may be arranged at suitable points and that such instruction be confined to fundamental scientific progress in the field rather than to commercial preparations

Recommendation No 13—It is recommended that the By-Laws be amended to reduce membership of the council to six elected members and three ex officio members namely the president, the president elect and the chairman of the House of Delegates The six elected members should be distributed geographically in accordance with the concentration of membership

Recommendation No 14—It is recommended that the Council be authorized to take such steps as may be necessary to obtain the best legal opinion on the status of the National Formulary as a legal standard under the Food and Drug Act and that such changes as may be required in the manner of selecting the Revision Committee in order to obtain Congressional authorization for the revision and publication of the National Formulary, be inaugurated as soon as possible It is further recommended that the U S P Revision Convention be urged to take similar steps with respect to the U S P

Recommendation No 15—It is recommended that the Committee on Proprietary Medicines be requested to study the possibilities of organizing an informational service to the profession with regard to the composition standards, classification and ethical status of proprietary medicines and report its recommendations to the Council for action at an early date

Recommendation No 16—It is recommended that the Committee on Cosmetics be requested to give immediate attention to the possibility of organizing a Council on Cosmetic Preparations with functions similar to the Council on Pharmacy and Chemistry of the A M A and the Council on Dental Therapeutics of the A D A so that necessary information on the composition and claims made for cosmetics may become available to pharmacists and proper standards be devised for the protection of the public in the commerce in these commodities

Recommendation No 17—It is recommended that the Council give immediate attention to the possibility of making available from the permanent funds accumulated interest, or other sources, a sufficient sum of money to launch some of the activities to which this ASSOCIATION is committed In launching these activities, preference should be given to the ones which appear to promise the most immediate return of the financial outlay required in their inauguration Activities which seem to require immediate attention are revision of the publication program, membership campaigns, Council on Pharmaceutical Practice

INTERNATIONAL PHARMACEUTICAL FEDERATION

The ninth general assembly of the International Pharmaceutical Federation was held on Monday, July 29th, in the rooms of the Nationale Pharmaceutique Brussels This is the second meeting of the Federation to be held in Brussels since the foundation in 1912 The President of the Federation (Dr J J Hofman The Hague) presided over an attendance of about fifty members, including Professor Dr L van Itallie (*president d'honneur*), M G Barthet, M O von Koritsanszky E Saville Peck and Dr E Host Madsen (*vice-president*), Professor Dr H Baggesgaard Rasmussen and Dean Burbidge of Nova Scotia

THE PAN AMERICAN MEDICAL ASSOCIATION

On August 2nd, the Pan American Medical Association completed its sixth cruise to South America The itinerary included brief visits to Nassau Jamaica and Curacao more extended visits to Rio de Janeiro and São Paulo, and again brief visits to Trinidad Puerto Rico and Bermuda The visit of more than a hundred American physicians to our South American neighbors must result in benefit to international relations and acquaint the South American countries more fully with the medicine of the United States Moreover, opportunity was given to the American visitors to obtain an insight into the medical institutions and to some extent into the nature of practice of the countries visited—*Jour A M A*

ADDRESS OF THE CHAIRMAN OF THE HOUSE OF DELEGATES

BY ROWLAND JONES

Ladies and Gentlemen of the House of Delegates

We are met here in the great Northwest, for the eighty-third annual convention of our ASSOCIATION. The eighty-third year in the life of the AMERICAN PHARMACEUTICAL ASSOCIATION just closed has been eventful. It seems that as the age of our organization increases, our problems increase in more than direct ratio. Organization for mutual effort is fast becoming one of the salient characteristics of the age in which we are living. We should be grateful that this ASSOCIATION continues to meet these problems, as in the past, in an honest and sincere manner and without any of the compromises which are the burdens of other professional organizations. I know of no organization of like kind in the country which is blessed with such a group of unselfish workers, often laboring in comparative obscurity, who only ask the opportunity to serve. It is this spirit, which I believe is unique, that has made this ASSOCIATION great and obtained for our profession the long list of major accomplishments of which we are all so proud.



ROWLAND JONES

The House of Delegates is representative of every interest in pharmacy. Its machinery is simple and direct in action. Every part of the nation has a place among its delegates. It offers to the state associations a national forum to which they may bring their problems and their successes. But I feel that the House of Delegates has not been used to the full extent of its possibilities and I invite the attention of the members to this fact. Ways and means should be formulated through which we may utilize the full potentialities of this body.

It has been my privilege during the past year to live in close proximity to the AMERICAN INSTITUTE OF PHARMACY, that marvelous monument to our profession which this ASSOCIATION now calls home. It is with pleasure that I take this opportunity to tell the members of this House how fortunate you are to have the services of E. F. Kelly and E. G. Eberle. I have had the privilege and pleasure of working closely with them during the past year. Their unceasing labor and outstanding devotion to this ASSOCIATION is inspiring to see. With such men as this in charge of the business of our ASSOCIATION, the future can never be in doubt.

In tracing the history of the past year, it is probable that it would be difficult for us to agree upon what the outstanding development in pharmacy has been. To my mind it has been the stipulation by Federal and State Relief agencies that prescriptions, paid for with public funds, shall call for U. S. P. and N. F. preparations whenever possible. As far as I know, this regulation has been in effect in every state and it is my experience that it has been generally complied with. I believe that this policy has brought our official compendiums to the attention of the

medical profession as never before and in a manner impossible by the usual methods of publicity and education. In my opinion, the salutary effect upon pharmacy has been enormous and we will feel it for a long time to come. I do not know who is responsible for the policy, but whoever he or they may be, we owe them our deepest gratitude.

During the past year, we have seen additional states join the ranks of the great number having adequate prerequisite laws. We are just beginning to feel the effects of this great change which we have accomplished in such a remarkably short time and I predict that during the next few years we will realize the results of which we have dreamed.

I invite you all to visit at the earliest opportunity one of our colleges of pharmacy, if you have not done so recently. Examine the plant, acquaint yourself with the members of the faculty, but above all observe the quality of the student body. The men and women now graduating from our colleges will give you a real thrill. These young men and women are the hope of our profession. As their number in active practice increases, many of our ills will disappear. The average income of the practicing pharmacist will increase to somewhere near the level commensurate with his educational investment.

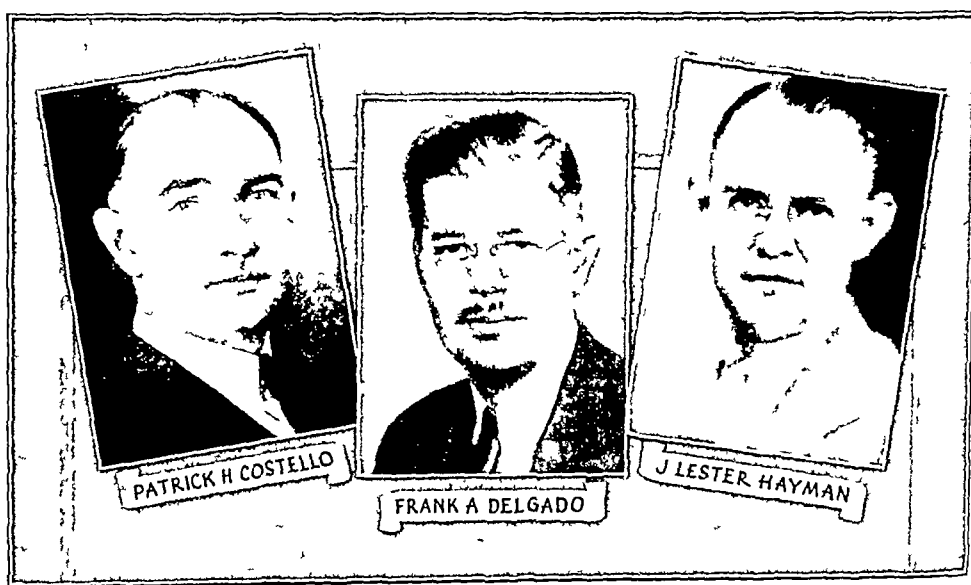
But these happy developments may bring another serious problem. I fear, unless economic conditions affecting retail pharmacy are not soon improved, that we will face a growing demand for a relaxation of present prerequisite requirements. Should this happen, we will find ourselves in a vulnerable legislative position. The annual graduation roll from our colleges has been drastically reduced. A scarcity of pharmacists with the increased remuneration which they will be sure to demand will strengthen the demand for a retrogression in standard of education in pharmacy unless competitive conditions improve or if they become worse as is a distinct possibility at this time. While the AMERICAN PHARMACEUTICAL ASSOCIATION has never been particularly active along commercial lines, and I think justly so, in the past at least, we may be forced to enter that field, in active competition with the other national body, in order to protect what I believe to be this ASSOCIATION's greatest accomplishment, the 4-year law. Present profit and loss statements of the average retail drug store indicates that an increased salary budget cannot be maintained with financial safety. A return to educational standards of twenty years ago would be a bitter pill to swallow. We simply cannot allow it to happen. No sacrifice would be too great if necessary to prevent it. I urge your earnest consideration of this very possible future trend of events.

Just a word about NRA and the codes. I deeply regret that the court decision invalidating that whole effort came just at the time when the loss limitation provision had begun to demonstrate its possibilities. However, I believe that the whole code effort has been worth all it has cost, that even to day we are feeling benefits from the lessons learned in that experience. Secretary Kelly's work on the National Code Authority was outstanding and invaluable and commercial pharmacy is indebted to the AMERICAN PHARMACEUTICAL ASSOCIATION for his services.

A great deal has been written of late about the multiplicity of pharmaceutical organization in this country, and the desirability of some method of consolidation of membership. Plans have been suggested but no one of them has been generally well received. While I feel that a physical consolidation of the AMERICAN PHAR-

MACEUTICAL ASSOCIATION and the National Association of Retail Druggists is neither desirable or possible, I am of the opinion that some mutually advantageous method of joint dues and membership can be found and recommend that further joint study of the matter be made

All of us in attendance at this convention are familiar with the long list of accomplishments of this ASSOCIATION which have improved the status of the profession of pharmacy and have thus vitally affected every pharmacist in every state. But I am of the definite opinion that far too many of the pharmacists of this country do not realize the extent of the benefits which have come to them as a direct result of the work of this ASSOCIATION. This is, because they have not been told about them. Modesty is to be admired but I feel that this ASSOCIATION has carried modesty a little too far for the good of the organization. I believe that efforts to bring the things that have been done and that are now in the process of fulfillment, to the attention of the average pharmacist might profitably be made without loss of dignity or prestige. I am not so sure but that the AMERICAN PHARMACEUTICAL ASSOCIATION has been hiding its light under a bushel, to some extent at least



The President and Vice-Presidents of the AMERICAN PHARMACEUTICAL ASSOCIATION
1935-1936

The officers of the House of Delegates for 1935-1936 are *Chairman*, Roy B. Cook, Charleston, W. Va., *Vice Chairman*, C. Thurston Gilbert, Noroton, Conn., *Secretary*, E. F. Kelly, 2215 Constitution Ave., Washington, D. C.

ADDRESS OF THE PRESIDENT OF THE AMERICAN ASSOCIATION
OF COLLEGES OF PHARMACY

BY ERNEST LITTLE

Mr Chairman, Fellow-Members, and Guests

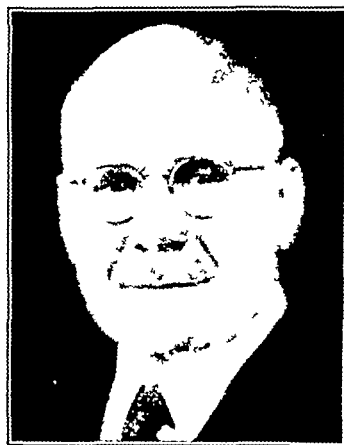
I know that I reflect the sentiment of my Eastern and Mid-Western associates when I say that we consider it a privilege to hold our thirty-sixth annual meeting of the American Association of Colleges of Pharmacy in this beautiful city of Portland. Your unusual hospitality has already made itself felt. We feel at home and at ease among cordial, sincere friends. We shall do our utmost to make this meeting one of the most pleasant, successful meetings in the history of our Association. How better could we show our respect, and express our appreciation to the citizens of this great state?

I realize that I am displaying no originality when I begin my presidential address with the statement that I have received incalculable benefit from the fact that it has been my privilege, during the past year, to read and critically study the proceedings of our meetings and the recommendations of our presidents of the past thirty-five years. I predict that this fact will continue to be commented upon by our presidents in the future. To review the progress of our Association from the time of its inception, thirty-five years ago, down to the present day, is an interesting and challenging experience. It was born with the dawn of the twentieth century in the city of Richmond, Virginia, where so many worthy projects have been initiated, and from whence capable leaders have stepped forth to carry promising infant projects to fruitful maturity.

To-day, three and a half decades later, we are assembled on the opposite side of our continent, where our Association stands forth as a great tribute to such past-presidents as Prescott, Remington, Kaufman, Whelpley, Hynson, Searby and Schlotterbeck, all of whom have passed to the great beyond. It must bring great satisfaction and some measure of pride to the hearts of such men as Edward Kremers, our oldest living Past-President, Wulling, Lyman, Jordan, Rudd and others of their type, who are still faithfully working with the vigor and enthusiasm of younger men.

I wish I might stimulate those of you who have not already done so, to review at least the presidential addresses of the past thirty-five years. You will find it an interesting and decidedly worth-while experience. I believe that the fund of information thus obtained, serving as a background for future deliberations, would greatly increase your efficiency and effectiveness as individual workers and would make for progress within the Association.

In my judgment, the present marks a rather vital period in the life of the A. A. C. P.—vital in the sense that we, in the next few years, must decide whether



ERNEST LITTLE

the wonderful potentialities brought into being by our predecessors will be fulfilled, or perhaps dissipated by an extravagant and somewhat less idealistic generation

Our Association will either become an increasingly vital, constructive force in pharmaceutical education or it will shrivel and atrophy until it is but a meaningless hulk whose possibilities were allowed to remain untapped by visionless or ineffective association members. This, as I see it, is the all important question which we must decide

I firmly believe that the spirit of such pioneers as Remington and Kremers and Whelpley will prevail, and that we shall not become satisfied with modern mediocrity

A few weeks ago, I heard one of our most respected and most dynamic past-presidents remark somewhat as follows

"I wish I knew what is the next step for our Association to take. We must go forward. It would be fatal to stand still, but I have never before felt so puzzled and uncertain."

I am in accord with the spirit of these remarks but shall take the liberty of revising them somewhat as follows

"The policy which the A. A. C. P. should pursue in the immediate future is not as definitely clear as it has been in the past. We must progress. It would prove most unfortunate if our appreciation of past progress should tempt us to indulge in a period of indolence and self appreciation. Such an attitude constitutes retrogression, and if followed for even a short time, leads only to disaster."

There is a great similarity in the spirit of these two statements, but also fundamental differences in their implications

We should all like to feel that we share, at least in a measure, the leadership which my respected friend so well exemplifies. Still, we should not abandon caution in working toward such an objective. The more dynamic one's leadership becomes, the more essential it is that caution should be one of its distinguishing characteristics. There is, perhaps, nothing more deadly than indolence, and no one more impotent than the reactionary. At the same time, we realize, that there are few things more perilous than unbridled ambition and possibly no individual more dangerous than the iconoclast. I once heard an iconoclast defined as a person who would blow up all existing organizations and institutions in the hopes that when the pieces fall, they may be better assembled. The chances are decidedly against improvement when the changes are so profound, and the forces responsible for them so violent. I am always a bit suspicious of the iconoclastic reformer, unless he can point to a record of real accomplishment as a result of his past activities. He is frequently impelled by an uncontrollable desire for change and for different, if not better, leaders.

Normal, natural changes take place slowly but continuously. We should not feel that it is absolutely essential for us to make an important pronouncement in order to progress during the ensuing year. It may be that the time can be spent to best advantage in substantiating our more recent advances.

Those of you who have seen the Washington monument, in our Nation's capitol, will recall that about half way up the monument there is a line of separation which seems to mark, or at least suggest, a temporary cessation of building activi-

ties at that point Upon asking the cause of this apparent line of cleavage, I was told that when the building had progressed that far, definite evidences developed that the foundation was inadequate for further altitude, in other words, they were unable to go higher until they went deeper

It seems very likely that retail pharmacy and possibly pharmaceutical education as well, may have reached a point where they ought not to go higher until they go deeper I realize that it is more interesting and satisfying to build upward in the sunshine of the day, than it is to labor, somewhat unknown, upon a subterranean foundation, important and fundamental as such work may be I know also that as true artisans we shall not hesitate to assume that responsibility which seems most necessary, and which we can best render If, for the time being, it seems inadvisable to build higher, we shall all devote ourselves to the less dramatic, but equally important foundational work, in order that, over the years, the progress of pharmaceutical education may continue uninterruptedly

Pharmacy is built upon a rather broad foundation which in turn supports such correlated institutions as pharmaceutical education, retail pharmacy, manufacturing pharmacy, wholesaling and other pharmaceutical activities We are more interested in certain restricted parts of this foundation, but all of it engages even our selfish attention Colleges of pharmacy cannot enjoy real and permanent prosperity, except in so far as the profession of pharmacy is also prosperous For this and other reasons as well, the interests of retail pharmacy and pharmaceutical education are closely coordinated and somewhat overlapping Perhaps we could advantageously spend a few minutes examining such parts of this general foundation as particularly concern retail pharmacy and pharmaceutical education

Even a cursory examination will reveal the fact that what may be thought of as the very corner-stone of the profession's foundation, namely, professional service, is greatly in need of strengthening I believe this weakness can be remedied and might very properly be attended to before the superstructure is again enlarged One of the great shortcomings of the retail pharmacist is lack of imagination, initiative and originality One of the pitfalls of any retail business is the temptation to sit down in an effectively organized and well-equipped store and wait for things to come to you You may be ever so patient but the end will not be accomplished The physician will not increase his prescription writing simply because the pharmacist wishes him to do so He must be shown that the patient's and physician's welfare, as well as the welfare of the pharmacist, can be best served by so doing

It would be well if our colleges gave more formally organized instruction in the contacting of physicians by pharmacists Such activities should be based, not upon high-pressure methods of salesmanship, but upon the ability to make clear to physicians how the welfare of the patient can be promoted by greater cooperation between physician and pharmacist

Some of you may very properly remark that comparatively recent changes in the curricula of medical colleges have made cooperative endeavor of this sort exceedingly difficult My answer is that the responsibility of our pharmacy colleges does not stop with their undergraduates I feel that, for the time being, at least, they must be prepared to render assistance to the registered pharmacists already in the field and to practicing physicians as well

In New Jersey, a joint committee of physicians and pharmacists, representing

the New Jersey Medical Society and the New Jersey Pharmaceutical Association, are cooperating in drawing up an abbreviated but exceedingly useful New Jersey Formulary. The work of this joint committee was discussed at great length by the New Jersey Medical Society at its last meeting in Atlantic City. Pharmacist members of the Joint Committee were in attendance at this meeting and presented a display of New Jersey Formulary preparations which had been prepared at the College of Pharmacy. A capable prescription pharmacist was in charge of the display at all times to explain the various preparations and the objectives of the Joint New Jersey Formulary Committee to the host of inquiring physicians. These prescriptions are being published in the *New Jersey Journal of Pharmacy* and the *New Jersey Medical Journal*.

The State Medical Society at this same meeting recommended to its county organizations that they invite properly qualified individuals from the profession of Pharmacy to appear before their county groups to assist in increasing the efficiency of the physicians in prescription writing and in promoting the use of such useful publications as the New Jersey Formulary. Needless to say, as much as possible will be done along this line. We find considerable enthusiasm on the part of physicians for this sort of cooperative endeavor. I know for a certainty that these New Jersey Formulary prescriptions are being increasingly used by the physicians of the state and would be still more generally used if we could develop more intelligent interest and continued enthusiasm on the part of retail pharmacists. The initiative and chief motive power must always come from the pharmaceutical group.

The opinion has been expressed that the development of state formularies is a backward, retrogressive step, that such work should be headed up as a national project by the U S P and N F Revision Committees. I can see much force and reason in such a suggestion. I believe, however, that much of what success we have experienced in New Jersey has been due to an appreciation on the part of physicians that they themselves were cooperating in the development of a formulary which would later be jointly used by pharmacists and physicians. They did not feel that a group of individuals, about whom they knew very little, was bringing pressure to bear on them to increase the professional work of the pharmacist. They were possessed of an enthusiasm born of cooperation and kindled by a thoroughly justifiable, if somewhat selfish, satisfaction which one experiences as a result of his personal participation in what seems to be a decidedly worthy project. It is possible that a national committee might supervise this important work in the various states in such a way as to retain the advantages which I have above enumerated.

The field of Dental Pharmacy, which has been so splendidly started by Assistant Dean Schicks is still in its infancy. Those who have had any experience in this field will, I believe, agree that the dentist possesses great enthusiasm to proceed with this type of professional work. I venture the opinion that the professional work of the retail pharmacist would be greatly increased, perhaps doubled, by the proper development of the field of Dental Pharmacy. It is reassuring to find an increasing number of workers appearing to follow up this most important pioneering work. The field is a big one and the surface hardly scratched. I trust that more volunteers will be forthcoming.

Professor Schicks has presented a course in prescription writing to the den-

tists of several county associations during the past two winters. The work has been received with enthusiasm and appreciation on their part. Prescriptions from dentists are coming into our stores in increasing numbers. A good start has been made. Again, this work would be greatly facilitated if we could devise some means of developing greater interest and more effective cooperation on the part of retail pharmacists.

Courses in Laboratory Clinical Pathology, including a comprehensive study of blood, urine, sputum, stomach contents, feces, spinal fluid and exudates, together with such special subjects as Wasserman and Kahn tests, kidney and liver function tests, determination of basal metabolism, the Friedman test for pregnancy, etc., would enable the pharmacist to increase his sphere of professional services to the physician in a manner beneficial to both and advantageous to the patient as well. I realize that courses of this nature are being offered in some, but comparatively few, of our colleges at the present time. It has been successfully offered as a graduate course during the past three years in the institution which I represent. Unusually well-trained and proven teachers are necessary for the successful presentation of the course.

These are but some of the ways in which colleges could more fully cooperate in increasing the professional services of the retail pharmacist and thus help to keep the corner-stone of the foundation of our profession firm and secure.

One hundred years ago the pharmacist was, of necessity, a resourceful man, possessing great initiative and ingenuity. He was responsible for the identification, selection and care of his drugs and the actual preparation of many of his inorganic chemicals, now obtainable from manufacturing chemists. In more recent years, many developments have greatly altered these conditions. The introduction of the pill machine, making possible the manufacture of coated pills on a large scale, the advent of machine-made plasters and other mechanical advances, made it less necessary for the pharmacist to use the highly specialized manipulative technique essential to such important preparations. The manufacture of tablet triturates and compressed tablets served to further reduce the professional work of the pharmacist and has, quite naturally, proved a great temptation to physicians to dispense such conveniently prepared medicaments.

Let us not waste time regretting the changes which the past has wrought, unfortunate as some of them may be, but let us look to the future with a feeling of real enthusiasm for the opportunities which are there presented. The rolling of pills, the making of tablets, the preparation of tinctures, are important and dignified operations, but if we find that some of these processes can be accomplished quite as well by machinery, lessening the time of preparation and greatly standardizing the manufacture of medicines of this type, we should not wish it otherwise. We should not regret that modern grinding machines have made it possible to pulverize in a few hours an amount of crude drug which would have required months if reduced by the pharmacist with the mortar and pestle, as previously done. These changes constitute progress and the pharmacist must progress as well. This, as I see it, is primarily the responsibility of our colleges of pharmacy. The pharmacist has had released considerable time previously required by his professional work. Much of this time is now being devoted to merchandising. It is the duty of our colleges to choose men of professional caliber and to offer to them such broad

fundamental training in the different branches of science as will enable them to use their time in a more professional manner. This is all quite possible and should be one of the main objectives of educators in the field of pharmacy.

Perhaps some of you may say that the institution which you represent has long ago altered its program and curriculum in such a way as to provide adequate opportunities of professional service for its graduates and that you have pointed out and stressed ways and means of effectively applying such talents. Without wishing to ignore any such sincere protests, the present status of retail pharmacy establishes the fact that our past efforts along this line have proved largely ineffective. The desired results have not been attained. It is imperative that we acknowledge our failure and rededicate ourselves to this most important obligation and responsibility. The responsibility rests squarely on our shoulders. The problem can be solved, but colleges of pharmacy must assume the leadership and play the leading rôle.

I do not wish to create the impression that the problem can be solved with fairy-like simplicity. I do not believe that it can. The difficulties involved are profound and fundamental, and only profound methods of solution will prove effective.

We must start at the beginning, with our entering students. We should estimate as accurately as possible the numerical needs of the profession. The overcrowding of any profession means eventual cheapening and loss of professional pride. An accurate estimate of pharmacy's numerical needs will, I believe, make it possible for us to rather carefully select our entering class. This selection should, of course, be based upon a consideration of the scholarship and general ability of the applicants, but even more important than that, upon their character, reliability and aptitude for professional work. It is, perhaps, true that the most profound problems in our professional fields to-day are due not so much to mediocrity on the part of their members, as to misguided ingenuity, lack of professional pride and decent responsibility. An industrious, persistent, conscientious and thoroughly reliable fourth-quarter high school graduate might very well be given preference over a brilliant, personally ambitious first-quarter student who measures success in terms of dollars and who achieves his objectives by whatsoever methods may prove most effective. One should not be thought of as failing to appreciate high standards of scholarship because he has learned to appreciate and evaluate such essential traits of character as industry, sobriety, purposefulness, self-control and honesty as essential complements of ability and power to achieve.

The wise selection of students for professional fields, involving important human contacts and relationships, will never become so standardized as to operate by rule-of-thumb methods.

In this connection, I feel the time has come for the Association to formally start work on the project of developing "Pharmacy Aptitude Tests," which tests should prove a great help to our member colleges in the selection of their students on a basis of character, ability and general aptitude for pharmacy. So far as I know, there are, at the present time, no tests available by means of which we can determine at all accurately, whether or not applicants for admission have the fundamental interests and abilities essential for reasonable success as pharmacy students.

and as pharmacists, hence the large number of failures which we find both in our colleges and in the profession as well

I realize that no system can be devised which will work at all perfectly, but I do feel that we should be able to determine to a reasonable degree of accuracy the abilities and aptitudes of prospective freshmen and thus insure a better grade of student and a higher type of practitioner as well. Such tests would, of course, be used as one of several indications of probable success and hence as only one of several bases of admission to the college of pharmacy.

Inasmuch as the development of such tests is likely to require a considerable period of time and should not be hurriedly done, I feel that the work should be begun without delay, making use of such information as may be found in the Charters' report, from the various drug survey reports, the national Pharmaceutical Syllabus, the Association of American Medical Colleges, the American Medical Association and other sources which will be easily discovered as soon as this work is seriously undertaken. Unless some such start is made, we shall find ourselves greatly handicapped in solving many of the problems confronting pharmacy to-day. We should never lose sight of the fact that pharmacy will very largely be what its practitioners desire it to be and that which they wilfully make it.

Having made the wisest possible choice of our students, we shall, of course, furnish these undergraduates with such scientific, professional and other training, as will best equip them to meet their responsibilities of the future. In so doing, we should keep ever before us the fact that we profess to be and are recognized as professional schools.

The above statement is not made in any supercilious, haughty attitude. We recognize, in the first place, that there is no sharp line of cleavage between professional and non-professional activities. We realize that no operation can be spoken of as being professional simply because it is involved and requires a considerable amount of technical or professional training for its successful execution. Coupled with this must be the desire and determination to render the highest quality of service of which one is capable, quite independently of what the financial return may be. When performed in this manner and in this spirit, the most lowly task becomes dignified, rises to great heights, and constitutes what many people like to think of as professional work.

Although the above attitude is indeed a wholesome one, I have never been able to bring myself to feel that any individual who does his best and has learned to do some one thing well, is entitled to be classified as a professional man. It requires much more than good intention to make a professional man. Long years of work and study in order to become familiar with the fundamental branches of science upon which the profession is based, still more intensive study in the specialized field of the profession involved, intellectual honesty, the ability to think clearly and concisely, arriving at conclusions through logical processes of reasoning—these are some of the characteristics which may very properly be expected of the professional man, but they are not enough. Coupled with such knowledge and intellectual accomplishments must be certain traits of character which are of equal or even greater importance. He should be industrious, tolerant, reliable, honest and above all else, imbued with the spirit of helpfulness even to the point of sacrifice. There is no place in any profession for a really selfish individual. The desire for personal

gain cannot be the controlling factor We are all obligated to provide for the future needs of ourselves and our dependents, but if we are to qualify as truly professional men, we must organize all of our activities around the central idea of service, and by that I mean, being just as useful and decent as possible in every human contact and relationship

In like manner, colleges of pharmacy, although they will have many and varied responsibilities of importance, should arrange and organize their activities around the central idea of professional training We should aim to stimulate our students to become useful, rather than wealthy, and efficient, rather than clever We should strive to turn out men whose chief ambition is not to capitalize and exploit pharmacy, but who will give serious profound thought to the problem of how they can best make their contribution to pharmacy and leave it not impoverished, but a little richer and a little more respected as a result of their contact with it On such a foundation we can look to the future of our profession with confidence and courage Without it, we have no guarantee of permanence and certainly very little virtue upon which to base any such expectation

During the past few years I have heard various legislative measures proposed to strengthen the foundation of retail pharmacy and to increase the security of the retail pharmacist Most prominent among them have been

- (a) The Capper Kelly Bill
 - (b) Restricting the sale of patent and proprietary medicines to the drug store
 - (c) Federal and State Drug Codes
 - (d) Pharmacist Ownership Bill
 - (e) Fair Trade Bills such as have recently been adopted by various states
- Etc , etc etc

All of them are primarily concerned with the non-professional activities of the pharmacist Some of them, such as the drug codes, have proved very transient, leaving despair and blasted hopes in their wake Others have been declared unconstitutional by the Supreme Court, still others probably would be so declared were they enacted into law

I have very little hope of affording the pharmacist permanent relief by way of legislation, except in so far as such legislative measures concern themselves with a service in behalf of public health and public welfare, which the pharmacist is especially prepared to render

The pharmacist's greatest feeling of security will be realized when he can stand forth as a truly professional man with the realization in his heart that his legislative needs are few, due to the fact, that he is offering an important professional service which few individuals are prepared to offer

That is the challenge confronting our colleges of pharmacy It is a problem which we and we alone can solve by the following procedure

(1) Careful and conservative selection of students, (2) Stressing professional training in our undergraduate work, (3) Adequate training and advice as to how these possibilities of professional service can best be realized following graduation, (4) Enlisting our services in promoting coöperative endeavor between physicians, dentists and pharmacists, thus increasing their mutual effectiveness in behalf of public health and public welfare

May we rededicate ourselves to this most important responsibility

Some of the more important remaining building blocks in the foundation of pharmacy, underlying retail pharmacy, are professional pride, desire to serve, desire to please, reliability, sustained industry, a conception of success based upon unselfish service, rather than material possessions, initiative and individuality, interest and activity in community affairs, and above all else, honesty

It would be inappropriate for me to discuss these important factors in this address. We all realize, however, that it is our responsibility and duty to develop these qualities and character traits in our students. By so doing, we help to keep secure the foundation of retail pharmacy, promote the success of its practitioners and insure the continued operation of our colleges of pharmacy.

There should be little uncertainty as to the responsibility of our colleges of pharmacy in the immediate future, when such profound and fundamental problems, threatening the very existence of pharmacy as a profession, are awaiting our solution.

The question of how much practical drug store experience should be required of graduates of a four-year course in pharmacy in an approved college of pharmacy, and when this experience should be obtained, is again being agitated by a small but exceedingly aggressive group.

Our Association has never put itself on record in regard to this question. Inasmuch as it pertains to the training of a pharmacist, I feel that we should so.

It is, I believe, very generally accepted that not more than one year of practical experience should be required of four-year college graduates. The question which has recently been reintroduced is whether or not this practical experience must be obtained following graduation. One state has recently passed legislation requiring at least one year of practical experience in an approved pharmacy, following graduation, as a prerequisite to the practical State Board of Pharmacy examination.

Some of the arguments put forth in favor of this requirement are as follows:

- I Such apprenticeship would closely parallel the year of internship which has worked out successfully in the field of medicine.
- II It would be obtained at a time when the apprentice would receive the most benefit from the training and would be of greatest value to his employer.
- III It would greatly simplify the task of regulating practical experience by Boards of Pharmacy.

May we spend a few minutes critically reviewing these arguments?

We are, of course, aware of the fact that the medical internship could hardly be placed at any other time than following graduation. The practitioner of medicine has few, if any, non-professional responsibilities and hence the student of medicine is not qualified to perform safely any of the duties of the physician until the completion of his college course, nor is he permitted by law to do so. His period of internship is served at a time most advantageous for himself, for the profession of medicine, and for the patient as well.

It sounds quite logical, therefore, to state that pharmacy should capitalize the experiences of medicine and that the embryo pharmacist should also be required to serve a year of internship in an approved pharmacy following graduation, before he is qualified for the practical state board of pharmacy examinations. The two situations, however, are not as similar as they appear to be upon superficial examination. The parallel is apparent, rather than real.

The pharmacy student, during his college course, is well qualified to perform most of the duties and responsibilities of the pharmacists and to obtain such additional training as we wish him to receive, as a supplement to his college training. This can be done with profit to himself and his employer and with safety for all concerned. It is not further training in professional work which the graduate of a four-year course in a recognized college of pharmacy most needs. This is being adequately taken care of both from the practical and theoretical standpoints. He must become familiar with the drug store in all its various aspects and become acquainted with the atmosphere prevailing therein. He must learn to feel at ease in the store, develop poise, learn how to approach customers in a pleasing manner, and discover the most efficient way of presenting goods to the prospective buyer. These are some of the things which can best be learned in the store itself and which make one year of practical drug store experience desirable, if not essential.

There is no reason, however, why such experience should necessarily follow graduation. In fact, it can be obtained to best advantage during the four-year college course. The three months' vacation periods between the sessions of the four college years afford the best opportunity for this work.

When the suggestion of a year's apprenticeship, following graduation, was first made by Doctor Beal many years ago, and later advocated by Doctor Army in one of our pharmaceutical journals, it was far more appropriate than it is to-day. At that time many colleges were not giving the profound training in practical and dispensing pharmacy which they are to-day offering. Doctor Beal's suggestion was perhaps a good one at the time it was offered. It is unfortunate that it has become antiquated and impractical before being seriously promoted.

I fear it is also not generally clear just how the apprentice would prove more useful to his employer during the year following graduation. He would not be qualified legally to perform any additional professional services. He could not compound prescriptions, sell poison, etc., except under the immediate direction of a registered pharmacist. His usefulness would not be greatly increased. In fact, it is very likely that a college graduate would be less willing to perform certain menial tasks which are essential to his all around training as a pharmacist and which would enable him to be of greatest value to his employer.

The statement that it would be simpler for boards of pharmacy to control practical experience is not a matter of primary importance. Many state boards succeed in keeping an adequate check on practical experience at the present time, even though the task is not an easy one. It is quite possible that this particular responsibility of state boards of pharmacy would be simplified by the proposed change but this advantage is more than counter-balanced by the less favorable considerations which I have enumerated.

A careful study of this question has led me to the following conclusions:

- I That the year of apprenticeship in a drug store following graduation is not analogous to the year of internship in medicine. The conditions are so different as to make it dangerous rather than wise for us to unthinkingly imitate medicine in this detail.
- II More value would be received from the year of apprenticeship if it were synchronized with the college work rather than following graduation. This has worked out very satisfactorily in the field of engineering and is in accord with the best thought in the field of pedagogy.

- III The apprentice would be of little more value to the pharmacist than before graduation unless the illegal practice of pharmacy is indulged in. The college graduate would be prepared to safely compound prescriptions and would probably be called upon to do so. Do we wish to put ourselves in the position of encouraging such illegal practice?
- IV An important responsibility of the boards of pharmacy might be somewhat simplified but at too great a risk to pharmacy and too great a hardship on the prospective pharmacist.
- V It would lengthen the period of the pharmacist's training from four to five years with no legitimate advantage to anyone. We should favor as much time as may be necessary to train, educate and prepare the pharmacist for his greatest usefulness and no more than this should be required.

I bespeak serious consideration of this question, with a view to making the policy of the Association known at the earliest possible time.

In case the Association feels that it is not in a position to go on record in regard to this matter at this time, I recommend that the executive committee be requested to give the problem careful consideration and present a definite recommendation to the Association at its 1936 meeting.

You have all heard recommendations from some of our members that the minimum course in pharmacy be lengthened from four to five or even six years. Others are advocating one or two years of pre-pharmacy work which might be carried out in such a way as to accomplish the same objective.

These recommendations are, of course, based upon the belief that need exists for men of more profound training, both in pharmaceutical industry and in promoting the possibility of professional services in the field of retail pharmacy.

I wonder if these needs could not be met by encouraging the development of graduate work on the part of such colleges as are in a position to adequately render such services, rather than changing the minimum pharmacy college course at this time. It seems to me that such is the case.

I do not mean by this that there should be a hurried development of graduate work on the part of our member colleges. Rather it should be gone about in a cautious, conservative manner. It is difficult enough to build up a strong staff for undergraduate teaching. It is much more difficult to obtain the services of individuals who can at the same time direct graduate and research work as well. It is likely that there are but few member colleges who are in a position to assume any such responsibility at this time. However, our colleges of pharmacy at the Universities of Florida, Maryland, Wisconsin, Minnesota and Washington, are among those who have set the example as to how it can and should be done.

I suggest that the development of a sound, conservative program of graduate work be considered as the next step in enlarging our educational program.

Such programs should be announced and the work offered, only after adequate graduate facilities, both from a standpoint of teaching and equipment, have been made available.

Few things could be of greater importance in pharmaceutical education than that we should be offering the best possible curriculum to our students. I believe it would prove advantageous if our Committee on Curriculum and Teaching Methods would concern itself more particularly with curriculum problems during the next several years. I realize, of course, that we are represented on a committee whose re-

sponsibility it is to draw up a national Pharmaceutical Syllabus, and I certainly have no desire to reflect unfavorably upon the functioning of that committee

Following up President Havenhill's suggestion of last year, I recommend that our Committee on Curriculum and Teaching Methods be requested to collect and study all available information bearing upon this important subject. Such material should include the findings and recommendations of the National Pharmaceutical Syllabus Committee and the various curricula as outlined in the catalogs of our colleges of pharmacy. With all this information before them, they should be able to draw up and present to us what might be called "An Ideal Pharmacy College Curriculum." Acceptance of this curriculum in its entirety would not be obligatory on the part of Association members. I am not aiming at greater standardization, but rather the crystallization, from the standpoint of pharmaceutical educators, of the various recommendations with which we are all more or less familiar.

Our committee might see fit to offer several curricula, one to prepare our graduates for retail pharmacy, curricula for various specialties in pharmaceutical industry, and perhaps for pre-medic training as well.

It is likely that after two or three years of operation along this line the report of this committee might become rather brief. I am certain, however, that there would always be something of a worth-while nature to report to us for our consideration.

I trust you will give close attention to the report of Dean Leigh's Committee on the Establishment of a Pharmaceutical Corps in the United States Army. Dean Leigh has given very conscientious and capable attention to the responsibilities of this committee during the past several years.

I am decidedly puzzled as to what the future activities of this committee should be. It might assume a more active, aggressive policy than it has been pursuing, but I believe there are many among us who feel that it would be unfortunate if we were forced to work at cross purposes with the Surgeon General of the United States Army.

I feel that the future policy of this committee should be based solely upon a consideration of the welfare of the enlisted men and the efficiency of the United States Army. Any coveted goal which we might achieve would, I fear, eventually prove disappointing unless we were prompted by the highest motives and objectives in achieving it, and unless we are prepared to render a real, vital, worth-while service, should we prove successful in our endeavor. I hope that Dean Leigh's report may greatly clarify the situation for us.

One of the most encouraging and comforting circumstances in the field of pharmaceutical education with which I am familiar, is the large number of capable, well-trained young men in our ranks who stand ready to assume their full share of responsibility, young men who, I believe, will make full use of our experiences of the past, but who may be possessed of greater freedom of action, due to the fact that they have somewhat less regard for the traditions of the past, than is found in the hearts of older men.

One of our most important responsibilities is to see that full use is made of these younger men. This, I believe, was one of the objectives which Dean Lyman had in mind when he requested the appointment of a "Problems and Plans Committee,"

of which he is now chairman I see possibilities of this committee developing into one of our most vital and important committees

As we endeavor to make greater use of the younger men, I trust that they, in turn, will retain an adequate appreciation of the vital need of older, more experienced individuals I like to picture maturity and youth traveling life's highway hand in hand, the youth pointing enthusiastically to opportunities which only he can clearly see, while the older man skilfully and diplomatically guides him safely past many perils and pitfalls which have escaped his attention, blinded as he is by the brilliance of the opportunities upon which his attention is so keenly fixed

May this picture represent the condition which is to exist in the A A C P in the years to come No condition could be more ideal

I recommend that the Association make available in inexpensive mimeograph form all of the past presidential addresses of this Association and that ten copies of this material be sent to each member college at the Association's expense

It is true they are available in the Proceedings My thought is to place them before our members in more available and convenient form

I suggest that final decision on this recommendation be left to the Executive Committee after estimates of the cost involved have been obtained

Your Association has been most active in matters pertaining to pure food and drug legislation during the past year Our activities along this line have been guided by an exceedingly efficient legislative committee, consisting of Deans Rudd, DuMez and Dean Jordan, *Chairman*

Dean Jordan and your president spoke before the Committee on Commerce of the United States Senate at a public hearing on Senate Bill S5, Print 3, the so-called Copeland Bill This bill subsequently passed the Senate, in modified form, but unfortunately was not brought out of committee in the House of Representatives

I shall refrain from giving more details pertaining to legislative matters at this time, for fear of encroaching on the report of Dean Jordan's Committee I feel that this committee should be continued and that it should be instructed to play an active part in behalf of legislation intended to promote public health and welfare I so recommend

The Dean of one of our Eastern colleges has very emphatically expressed the opinion that the A A C P should concern itself solely with matters of pharmaceutical education, leaving pure food and drug legislation, pharmacy corps in the United States Army and similar problems to the A P H A, N A B P, N A R D and related pharmacy organizations

I certainly agree that the major responsibilities of the A A C P are in the field of pharmaceutical education I recognize the danger of spreading one's energies too thinly, but I also feel that it would be most unfortunate if we did not stand ready to lend a helping hand wherever possible in the general field of pharmacy I do not feel that any organization should consider that its activities must be forever limited by the purposes set forth in its constitution

It is only by properly coordinated and, not infrequently, by overlapping activities of these various organizations, that the greatest good can be accomplished in behalf of pharmacy

I recommend the appointment of a professional relations committee whose

responsibility shall be to bring before our members the ways and means which are being employed in the various states, of increasing the professional services of the retail pharmacist and improving his contacts and relationships with physicians and dentists. The efficient functioning of such a committee should make it possible for our colleges of pharmacy to more effectively cooperate in increasing the professional services of our present and future retail pharmacists.

I am pleased to report to you that our Association has been admitted to membership as one of the affiliated organizations of the American Association for the Advancement of Science. Membership in this respected and influential organization gives a contact which will add to the dignity and prestige of our Association as a professional group. I feel that we should make the most of this new contact.

A most creditable pharmacy program was presented at the Minneapolis meeting, held June 27th of this year. This program was presented in conjunction with the division of Medical Sciences, under Section N, of the associated societies.

At the St. Louis meeting, to be held from December 30, 1935 to January 4, 1936, pharmacy will have the opportunity and decided responsibility of again presenting such a scientific program. This new venture will prove to be either a splendid asset or a decided liability to our Association and to the profession of pharmacy. It is most essential that the project succeed and that the A. A. C. P. play its full part in insuring such success.

I recommend that, for the ensuing year, the Executive Committee be made responsible for the A. A. C. P. activities in this scientific program and that at the 1936 annual meeting they recommend to us that, which in their judgment, is the best permanent policy for this Association to adopt in this connection.

I am sure we all agree that a joint meeting with the American Medical Association or American Dental Association would prove most helpful to pharmacy and to the medical and dental professions as well. I fear that many of you are already questioning the wisdom of spending even a few minutes discussing a recommendation which is so obviously impossible of attainment. The solution of any problem is made immeasurably more difficult if approached with an attitude of defeatism.

There never was a time when physicians and dentists were more willing and eager to cooperate with the pharmacist than they are to day. I believe it is within the realm of possibility that such a meeting or meetings can be arranged.

I recommend that the incoming officers and members of the Executive Committee be directed to give serious thought to this proposed project and that they be requested to present a report of their deliberations at the 1936 meeting. This is one of several projects which might well be referred to a committee on professional relations.

If it seems impossible to arrange such a joint meeting, in the sense of sharing a half-day joint program with either one of these organizations, it is possible that permission would be given us to place a speaker on the program of one of their annual meetings. Such a speaker should be able to diplomatically and effectively point out the need for greater cooperation between these three professional groups and perhaps pave the way for a future joint meeting.

I have the very definite feeling that if this general problem is given careful consideration, the Executive Committee will be able to present to us a recommendation possible of attainment, which will prove an effective start in the right direction.

I wish to thank our secretary, the chairman of the Executive Committee, our vice-president, committee chairmen and the other officers and members of the Association for the really fine, helpful support and cooperation which has been accorded me during the past year. Without such cooperation but little of value could have been accomplished. With it, the past year has proved to be a most happy and prosperous one, at least so far as your president is concerned.

ADDRESS OF THE PRESIDENT OF THE NATIONAL ASSOCIATION OF BOARDS OF PHARMACY

BY CHARLES HALL EVANS, PRESIDENT

Mr Chairman, Members of the National Association of Boards of Pharmacy and Guests

In selecting "The City of Roses" as the meeting place for the thirty-second annual convention of the *National Association of Boards of Pharmacy*, we have chosen a section rich in historical tradition and one noted for its scenic beauty.

Only a short distance away is the Pacific Ocean. Mount Hood with its snow fields and glaciers, vast stands of forest, jewel-studded lakes, the beautiful Columbia River Highway, Bonneville Dam and Multnomah Falls are but a few of the many wonderful sights within easy reach of this beautiful city.

In coming to Portland, we are meeting for the first time in the history of the Association in the Great Pacific Northwest, in fact, it is the first time in twenty years that we have held a meeting west of the Rockies, the San Francisco meeting of 1915 being the last.

We who live in the densely populated sections of the country where most of the conventions are held can attend the meetings every year with little effort and expense. These meetings mean something to us beyond the formal program and the business transacted.

There is the opportunity of getting acquainted with brother examiners from other states, who have the same interest and the same problems as we have, and a bond of common understanding results. It is on this spirit of mutual cooperation that confidence between boards rests, it is the very foundation of the Association itself.

I want to remind you that our Western friends have been denied this privilege because of certain economic and geographic barriers. We have broken the isolation this year by coming out here for the convention and they have responded most whole-heartedly by attending the sessions we have planned. At the most, we have only a few days together, so let us make the best possible use of them by getting acquainted immediately.



CHARLES HALL EVANS

To our Western colleagues, I want to say that your problems are our problems and while a formal program is necessary to cover the business of the Association, you are most welcome to interrupt at any time and ask questions

ASSOCIATION ACTIVITIES

Economic conditions the past few years have made it necessary for us to outline and adhere rather strictly to a budget for operations, and we had to cut operations sometimes in certain directions when we did not want to do so. But the policy has been a sound one, as our financial condition to-day indicates. We held our 1934 convention before the close of the fiscal year but I am glad to inform you that when the books were closed as of June 30, 1934, we showed a gain of some \$400 00, instead of drawing on cash reserves as we had been doing for the three previous years.

The budget for this year was outlined on the basis of \$15,000 00 income from dues and reciprocal applications, with an estimate of 500 applications to be issued. However, at the time this address is being written, I am informed that more than 600 applications have been issued which indicates that the financial reports this year will be even better than last. As the details will be given in the reports of the secretary and the treasurer, as well as the Executive Committee, I shall omit them here.

DISTRICT MEETINGS

Since the Washington convention, Districts Nos. 1, 2, 4, 5 and 6 have held meetings, and I am informed that District No. 7 will hold a session here in Portland on Wednesday. This is a splendid record, and I want to thank the vice-presidents for the whole-hearted cooperation they have given me.

Also, I want to thank you for the invitations to attend these district meetings, I wish I could have been present at every one of them. I did attend the Sixth District meeting at New Orleans. Mac Childs, the acting chairman, had worked out an excellent program and the meeting was well attended.

One of the greatest benefits that we derive from our district meetings is the friendly fellowship which develops between the board and college members of the group. We get to know our neighbors more intimately and we find that our problems in reciprocity and in examinations are more easily met when thorough understanding exists.

While I would not minimize the great good accomplished at these meetings, yet there is a grave danger when measures are sponsored which break away from the ideal of national uniformity which is the primary purpose of the Association. We must remember that a condition that may prove ideal in a particular district may not work out well in other districts, or nationally. We must give consideration to the make-up of the various districts, the distances covered, the population, the number of colleges of pharmacy, and other factors that make each district different from the others.

Each district has a certain amount of business to transact which is of local import only, which has no effect on national policies. On matters of national import, great care should be exercised by those in charge of the program to see that the time is not spent in discussing new and untried ideas which may be suitable

for the particular district concerned but which would not receive the majority support necessary to make them effective nationally. Such discussions really harm the cause of uniformity.

We must make progress, we cannot stand still. Times and conditions are rapidly changing, yet we should be ever mindful of the cardinal objectives of this Association as laid down in our Constitution.

Before we leave the basic principles, as yet unfinished, let us see to it that all the districts have caught step with the march before we proceed with new objectives, that may retard progress on the goals nearly attained.

RECIPROCITY

Article 2 of our Constitution states the object of this organization to be the promotion of "inter-state reciprocity in pharmaceutic licensure, based upon a uniform minimum standard of pharmaceutic education and uniform legislation, and to improve the standards of pharmaceutical education and licensure by co-operating with State, National and International agencies and associations having similar objects."

While the subject of reciprocity has been discussed fully every year, yet as stated in Article 2 just read, it is the corner-stone of the N A B P.

Reciprocity boiled down is essentially the application of common sense. With the constantly changing personnel of our boards of pharmacy, reciprocity has been in "hot water" in some states due to a desire on the part of the inexperienced members to adhere strictly to the letter of the law rather than to use the discretionary powers vested in the board of pharmacy under that law. An educational program undertaken by the older and more experienced members of the board to instruct these new members in such matters would overcome the friction and save the Secretary's office much unnecessary correspondence.

LEGISLATION

Chairman Mac Childs of the Legislative Committee will cover this phase of our activities in his usual efficient manner. I shall not make other comment than to say that we welcome Arizona and New Mexico to the list of states requiring college graduation for entrance to the board examination and congratulate them. Several other states tried and failed. We can only urge them to try again at the next session. Iowa also is to be congratulated on having increased its two-year college attendance requirement to college graduation. Also a few of the states cut experience requirements to one year, in view of the four-year course. Thus the steady march of progress toward a uniform goal goes on.

Let us as an Association, and especially the bordering neighbor states, lend every possible assistance to the five remaining states without any provision for compulsory college education. Delaware, Massachusetts, Nevada, Tennessee and Vermont, so that they may attain this goal by the year 1940 as set out in the recommendation of President Gilbert last year.

CONVENTION ATTENDANCE

A vigorous effort on the part of the N A B P should be made to increase the average yearly attendance at the conventions. There are probably other reasons

for non-attendance but "lack of funds" seems to be the main cause. Out of 49 member boards, only 30 send delegates regularly.

In those states where funds are not available for traveling expenses from the board or the state treasury, the state pharmaceutical associations should be called upon for help. The initiative for such a move rests with the older board members who understand the importance of such representation, it is up to them to stress it at the state association meetings. Certainly, the pharmacists of each state are entitled to at least one delegate to represent their interests at a meeting where rules which affect the reciprocal privileges of every pharmacist are made.

In most states, the governor makes his appointments to the board of pharmacy from a list submitted by the state pharmaceutical association. Fitness as an examiner should be the first consideration, of course. However, there are usually many contenders for the honor of serving on the board, here again the ex-board members can be of service by urging the selection of those who are willing and able financially to make certain sacrifices that should go with the honor, namely, willingness to attend the N A B P conventions at their own expense when necessary. I am including a recommendation covering these points at the conclusion of this address.

BOARD APPOINTMENTS AND HIGHER STANDARDS

In 1936, the first four-year classes will be presenting themselves for board examinations. As an organization, the N A B P has done much to promulgate these higher standards. With a better class of student now entering the profession, the next step would seem to be improvement of our own board examinations. As the examiner is a political appointee with full power to act, only diplomatic persuasion can be used, assistance, usually, cannot be rendered unless it is requested.

The system of having the recommendations for the appointments come from the pharmaceutical association has released the governor from responsibility to a great extent and placed it with the profession itself. Have we taken this duty too lightly in the past? It is true that we have had honest, conscientious men, but have they always been the most capable or the ones best fitted to undertake examination work? Has it not become more or less a habit to award the state board appointments to those who have been most active in state association work? Are such persons always the best examiners? True, they do deserve glory for having given the time and effort it takes from selfish interests to further the interests of the state group as a whole. But such men often have devoted much time and thought to the legislative and commercial angles, such as fair trade practice bills, working with manufacturers to better conditions, and have had little time left for the study to fit themselves for specialized examination work. In each state, if you search, you will find men with a particular bent for the professional angle, who keep abreast of the developments in modern chemistry and medicine, because they are interested in these things. They may not have done a great deal of committee work in the state association, or they may not have held office, but they are peculiarly fitted for board examination work. Isn't it to our own interest to give them an opportunity to render service instead of trying to fit a square peg in a round hole?

All that I say is not meant in any spirit of criticism of members now serving on the boards or of those who have served in the past. We have now and have had in

the past many exceptionally capable men, but how much more we could accomplish if *all* board members were of this type Under the four-year course requirement, the candidates who come to us will be better-grounded in the fundamental sciences and our board members must be able to meet them on the same plane or criticism will result Already, there is evidence of such a critical trend

I believe that this is a situation which should be brought to the attention of the state pharmaceutical associations by the N A B P and with this in mind, I have formulated a recommendation at the conclusion of this paper If adopted, a copy is to be transmitted to each state association by our secretary

IN MEMORIAM

Each year it is the duty of the President to report the deaths of those from our ranks, both active and past members, who have passed on to their final reward The list includes

W E Bingham, Alabama
F T Hafelfinger, District of Columbia
Alex F Peterson, Montana

At a later session we shall allow their colleagues to pay a more fitting tribute to their memory but at this time, I think it appropriate that we stand for a moment with bowed heads in silent tribute to the memory of these departed friends

In the passing of Dr Bingham, the N A B P has lost one of her oldest and best loved friends as well as her first Honorary President Only those who have been associated with him in the work these many years can understand how much he has meant to us

CONCLUSION

I appreciate deeply the honor that has been accorded me as the first Georgian to be elected to the presidency of this great organization If you will refer to your map, you will see that I have traveled from the next to the last state on the southeastern boundary of the United States to the next to the last state in the northwestern part to attend this meeting I am sure that a trip like this must inspire in every one who takes it a greater love of country, especially in those from eastern, central and southern states where space is more limited

I want to thank the committees, the vice-presidents and the other officers for their splendid cooperation during my term of office

Secretary Christensen has forwarded me copies of the most important correspondence of his office, and I have become acquainted with the great amount of work attached to the central office I want to commend Secretary Christensen and the entire personnel of his office for the very efficient manner in which the work of the Association is carried on

As I step back into the ranks, I want each one of you to know that I am ready and willing at all times to answer any call for the promotion of pharmacy

There are many vital issues at stake in these times There is a clarion call for leadership from the ranks of the pharmacists of the nation Aside from the Pharmacy Corps legislation, the Pure Food and Drugs Act and the professional and commercial pharmacy question, there are many issues of a strictly commercial or

economic nature that will require the cooperation of all pharmacists everywhere and unified leadership

May we as board members and enforcement officers accept the challenge and institute in our own stores and communities an educational program that will place pharmacy where she belongs and give her rightful professional recognition!

Recommendations

Resolved, That in the interest of bringing about closer coöperation between states, every board of pharmacy should be represented at the annual N A B P conventions Where the state treasury allows no such budget, the state pharmaceutical association should make some provision for sending a board delegate to represent the interests of the pharmacists of that state Where neither the state treasury nor the pharmaceutical association can assume this expense, some consideration should be given to the willingness of board members personally to make such a sacrifice when the appointment lists are made up, but not overlooking the fact that fitness as an examiner should be the first consideration

Resolved, That the N A B P ask the coöperation of state pharmaceutical associations by requesting that the first consideration in submitting lists of appointees to the governor for appointment to the board should be the fitness of such persons as examiners, rather than activity in state association affairs, the object being to improve the quality of state board examinations in the future

REPORT OF THE FAIRCHILD SCHOLARSHIP COMMITTEE

The Fairchild Scholarship Committee of this year is composed of Robert P Fischelis, Ernest Little C H Evans and E G Eberle, *Chairman* The University of Michigan, among others, presented no candidates for the examination and the Director of the School of Pharmacy, Howard B Lewis with the assistance of members of the Pharmacy faculty, consented to prepare the questions for the examination and grade the answers

Twenty-one candidates participated in the examination representing twelve schools The examinations were given under three subjects Pharmacy, Chemistry and Materia Medica The highest average was made in Pharmacy next in Materia Medica lowest Chemistry The lowest average was made in Chemistry next in Pharmacy, next in Materia Medica Candidates of the same school did not have closely related records The candidate making the highest average tied with another for second place in Chemistry was first in Materia Medica and first in Pharmacy The second in rank was sixth in Chemistry third in Materia Medica and sixth in Pharmacy The one ranking lowest in general average was lowest in Chemistry, was next to the lowest in Materia Medica and next to the lowest in Pharmacy The one lowest in Materia Medica rated next to the lowest in Chemistry and twelfth highest in Pharmacy No further effort has been made to draw deductions



FERDINAND ZIENTY

The candidate making the highest average in the Examination for 1935 is Ferdinand Zienty of Chicago, Ill. His standing was high both in High School and Junior College and he was commended as "an energetic young man of fine character."

The winner of the Fairchild Scholarship for this year was graduated from the University of Illinois College of Pharmacy with high honors, receiving "A" in every subject except one, Physiology, in which he was graded "B." He graduated from the 4 year course, the last year's subjects included Food Analysis and Microscopy of Foods. The first year course is administered as a pre pharmacy year of 30 semester hours of work in liberal arts and science in an accredited college and including certain specified subjects such as English, General and Organic Chemistry, and Mathematics (Algebra and Trigonometry).

Mr Zienty was awarded the degree of Bachelor of Science by the University of Illinois. He intends to continue his studies in Pharmacy.

The Committee desires to thank Director Howard B. Lewis and members of the faculty of the University of Michigan School of Pharmacy for their cooperation.

(Signed) ROBERT P. FISCHELIS, C. H. EVANS
ERNEST LITTLE, E. G. EBERLE, *Chairman*

LIST OF REGISTRANTS, ANNUAL MEETING, A. P. H. A., PORTLAND, OREGON

Corrections and additions are respectfully requested, a number evidently failed to sign the official Registration Book, the names are given as recorded. Please address JOURNAL AMERICAN PHARMACEUTICAL ASSOCIATION, 2215 Constitution Ave. N. W., Washington D. C.

ADAMS WALTER D. Mr and Mrs. Forney Texas
ARLEN C. F. Redwood City Calif
ANDERSON CHARLES A. Mr and Mrs. Litchfield Minn
ARNY H. V. New York City
ARNY KATHARINE S. Montclair N. J.
AVERY CHARLES H. Altadena Calif

BACHMAN GUSTAV Minneapolis Minn
BACON FRANKLIN J. Cleveland Ohio
BAKER ARTHUR D. Denver Colo
BANG HAAKON Pullman Wash
BANNING JENNIE M. Sioux City Ia
BEAL GEORGE D. Pittsburgh Pa
BEAL JAMES H. Mr and Mrs. Fort Walton Fla
BEALS ERNEST L. Mr and Mrs. Pocatello Idaho
BEARD JOHN G. Chapel Hill N. Car
BECKER IRWIN A. Chicago Ill
BEIRNE HUGH P. New Haven Conn
BELL A. B. Portland Ore
BERG F. F. Floral Park N. Y.
BIBBINS F. E. Mr and Mrs. Indianapolis Ind
BISHOP W. J. Greeley Colo
BLAKELEY GEORGE C. The Dalles Ore
BLANEY CORA B. Baltimore Md
BOWEN MRS. LILLIAN Chicago Ill
BOYER JOHN M. Portland Ore
BRACKEN L. D. Seattle Wash
BRADLEY THEODORE J. Boston Mass
BRADY P. H. Mr and Mrs. Spokane Wash
BRIGGS W. PAUL Washington D. C.
BRITT LEWIS C. Corvallis Ore
BROGAN CLARENCE RICHARD Los Angeles Calif
BROOKS MRS. B. L. Forney Texas
BROWN CLARENCE M. Mr and Mrs. Columbus Ohio
BROWN HENRY M. Mr and Mrs. Scranton Pa
BUNTING GEORGE A. Baltimore Md
BURLAGE HENRY M. Mr and Mrs. Chapel Hill N. Car
BUSH R. A. Portland Ore

CAIN R. A. Seattle Wash
CALLAGHAN PERRY JAMES Manchester N. H.
CARMODY MRS. M. Silver Springs Md
CAREY H. B. Mr and Mrs. San Francisco Calif
CHAPMAN I. RAY Portland Ore
CHILDS MAC E. Dorado Kansas
CHRISTENSEN H. C. Mr and Mrs. Chicago Ill
CHRISTENSEN FRANK L. Lewiston Idaho
CLARK R. W. Madison Wis
CLAYTON CHARLES J. Denver Colo

CLEMMER JOHN K. Miami Fla
CONNESSA SISTER M. St. Paul Minn
COOK E. F. Philadelphia Pa
COOK ROY BIRD Charleston W. Va
COOPER ZADA M. Iowa City Iowa
COSTELLO P. H. Mr and Mrs. Cooperstown N. Dak
CULLEY JOHN San Francisco Calif

DANIELS ELIZABETH H. San Francisco Calif
DANIELS TROY C. Redwood City Calif
DAY W. B. Mr and Mrs. Chicago Ill
DEAN IONARD E. C. Pocatello Idaho
DEBRITT H. F. Portland Ore
DELGADO F. A. Mr and Mrs. Washington D. C.
DILLON I. F. Portland Ore
DIXSTIN P. H. Pullman Wash
DRETZKA SYLVESTER H. S. Milwaukee Wis
DUBOIS CHARLOTTE F. Catskill N. Y.
DUMEZ A. G. Mr and Mrs. Baltimore Md
DUNCAN E. E. Mr and Mrs. Oklahoma City Okla
DUNN MARIN S. Philadelphia Pa
DYE CLAIR A. Mr and Mrs. Columbus Ohio

EBERLE E. G. Mr and Mrs. Washington D. C.
EBY FRANK H. Philadelphia Pa
ELWOOD H. S. Ellensburg Wash
EMANUEL LOUIS Mr and Mrs. Pittsburgh Pa
ENGELKING MRS. A. G. and DAUGHTER San Antonio Texas
EVANS CHARLES E. Warrenton Ga
EVANS CLAIRE Seattle Wash

FEEHAN MARTIN E. Lewiston Idaho
FISCHELIS R. P. Mr and Mrs. Trenton N. J.
FISCHER E. B. Minneapolis Minn
FISCHER LOUIS Seattle Wash
FLEMING FRED D. Los Angeles Calif
FLEMING R. W. Reno Nevada
FORD M. N. Mr and Mrs. Columbus Ohio
FOSS E. S. Mr and Mrs. Preston Idaho
FREDERICKS F. H. Mr and Mrs. Cincinnati Ohio
FUHRMANN CHARLES J. Mr and Mrs. Washington D. C.
FULTON WM. M. San Francisco Calif

GARVIN ALICE E. New Haven Conn
GATHERCOAL E. N. Chicago Ill
GAYLE J. W. Frankfort Ky
GEUE F. A. Portland Ore
GILBERT C. T. Noroton Conn
GILFILLAN T. A. Corvallis Ore

economic nature that will require the cooperation of all pharmacists everywhere and unified leadership

May we as board members and enforcement officers accept the challenge and institute in our own stores and communities an educational program that will place pharmacy where she belongs and give her rightful professional recognition!

Recommendations

Resolved, That in the interest of bringing about closer coöperation between states, every board of pharmacy should be represented at the annual N A B P conventions Where the state treasury allows no such budget, the state pharmaceutical association should make some provision for sending a board delegate to represent the interests of the pharmacists of that state Where neither the state treasury nor the pharmaceutical association can assume this expense, some consideration should be given to the willingness of board members personally to make such a sacrifice when the appointment lists are made up, but not overlooking the fact that fitness as an examiner should be the first consideration

Resolved, That the N A B P ask the coöperation of state pharmaceutical associations by requesting that the first consideration in submitting lists of appointees to the governor for appointment to the board should be the fitness of such persons as examiners, rather than activity in state association affairs, the object being to improve the quality of state board examinations in the future

REPORT OF THE FAIRCHILD SCHOLARSHIP COMMITTEE

The Fairchild Scholarship Committee of this year is composed of Robert P Fischels Ernest Little C H Evans and E G Eberle *Chairman* The University of Michigan, among

others, presented no candidates for the examination and the Director of the School of Pharmacy, Howard B Lewis, with the assistance of members of the Pharmacy faculty consented to prepare the questions for the examination and grade the answers

Twenty-one candidates participated in the examination representing twelve schools The examinations were given under three subjects Pharmacy Chemistry and Materia Medica The highest average was made in Pharmacy next in Materia Medica, lowest Chemistry The lowest average was made in Chemistry next in Pharmacy, next in Materia Medica Candidates of the same school did not have closely related records The candidate making the highest average tied with another for second place in Chemistry was first in Materia Medica and first in Pharmacy The second in rank was sixth in Chemistry third in Materia Medica and sixth in Pharmacy The one ranking lowest in general average was lowest in Chemistry, was next to the lowest in Materia Medica and next to the lowest in Pharmacy The one lowest in Materia Medica rated next to the lowest in Chemistry and twelfth highest in Pharmacy No further effort has been made to draw deductions



FERDINAND ZIENTY

The candidate making the highest average in the Examination for 1935 is Ferdinand Zienty of Chicago, Ill. His standing was high both in High School and Junior College and he was commended as "an energetic young man of fine character."

The winner of the Fairchild Scholarship for this year was graduated from the University of Illinois College of Pharmacy with high honors, receiving "A" in every subject except one Physiology, in which he was graded "B." He graduated from the 4 year course, the last year's subjects included Food Analysis and Microscopy of Foods. The first year course is administered as a pre pharmacy year of 30 semester hours of work in liberal arts and science in an accredited college and including certain specified subjects such as English, General and Organic Chemistry, and Mathematics (Algebra and Trigonometry).

Mr Zienty was awarded the degree of Bachelor of Science by the University of Illinois. He intends to continue his studies in Pharmacy.

The Committee desires to thank Director Howard B. Lewis and members of the faculty of the University of Michigan School of Pharmacy, for their cooperation.

(Signed) ROBERT P. FISCHELIS, C. H. EVANS
ERNEST LITTLE, E. G. EBERLE, *Chairman*

LIST OF REGISTRANTS, ANNUAL MEETING, A. P. H. A., PORTLAND, OREGON

Corrections and additions are respectfully requested, a number evidently failed to sign the official Registration Book, the names are given as recorded. Please address JOURNAL AMERICAN PHARMACEUTICAL ASSOCIATION, 2215 Constitution Ave. N. W., Washington, D. C.

ADAMS WALTER D. Mr AND MRS. Forney Texas
ALLEN C. F. Redwood City Calif.
ANDERSON CHARLES A. Mr AND MRS. Litchfield Minn.
ARNY H. V. New York City
ARNY KATHARINE S. Montclair N. J.
AVERY CHARLES H. Altadena Calif.

BACHMAN GUSTAV Minneapolis Minn.
BACON FRANKLIN J. Cleveland Ohio
BAKER ARTHUR D. Denver Colo.
BANG HAAKON Pullman Wash.
BANNING JENNIE M. Sioux City Ia.
BEAL GEORGE D. Pittsburgh Pa.
BEAL JAMES H. Mr AND MRS. Fort Walton Fla.
BEALS FRNEST L. Mr AND MRS. Pocatello Idaho
BEARD JOHN G. Chapel Hill N. Car.
BECKER IRWIN A. Chicago Ill.
BEIRNE HUGH P. New Haven Conn.
BELL A. B. Portland Ore.
BERG F. F. Floral Park N. Y.
BIBBINS I. F. Mr AND MRS. Indianapolis Ind.
BISHOP W. J. Greeley Colo.
BLAKELEY GEORGE C. The Dalles Ore.
BLANEY CORA B. Baltimore Md.
BOWEN MRS. LILLIAN Chicago Ill.
BOYER JOHN M. Portland Ore.
BRACKEN L. D. Seattle Wash.
BRADLEY THEODORE J. Boston Mass.
BRADY P. H. Mr AND MRS. Spokane Wash.
BRIGGS W. PAUL Washington D. C.
BRITT LEWIS C. Corvallis Ore.
BROGAN CLARENCE RICHARD Los Angeles Calif.
BROOKS MRS. B. L. Forney Texas
BROWN CLARENCE M. Mr AND MRS. Columbus Ohio
BROWN HENRY Mr AND MRS. Scranton Pa.
BUNTING GEORGE A. Baltimore Md.
BURLAGE HENRY M. Mr AND MRS. Chapel Hill N. Car.
BUSH R. A. Portland Ore.

CAIN R. A. Seattle Wash.
CALLAGHAN PERRY JAMES Manchester N. H.
CARMODY MRS. M. Silver Springs Md.
CAREY H. B. Mr AND MRS. San Francisco Calif.
CHAPMAN I. RAY Portland Ore.
CHILDS MAC E. Dorado Kansas
CHRISTENSEN H. C. Mr AND MRS. Chicago Ill.
CHRISTENSEN FRANK L. Lewiston Idaho
CLARK R. W. Madison Wis.
CLAYTON CHARLES J. Denver Colo.

CLEMMER JOHN K. Miami Fla.
CONCHESSA SISTER M. St. Paul Minn.
COOK E. F. Philadelphia Pa.
COOK ROY BIRD Charleston W. Va.
COOPER ZADA M. Iowa City Iowa
COSTELLO P. H. Mr AND MRS. Cooperstown N. Dak.
CULLEY JOHN San Francisco Calif.

DANIELS ELIZABETH H. San Francisco Calif.
DANIELS TROY C. Redwood City Calif.
DAY W. B. Mr AND MRS. Chicago Ill.
DEAN LEONARD E. C. Pocatello Idaho
DEBRITT H. F. Portland Ore.
DELGADO F. A. Mr AND MRS. Washington D. C.
DILLON I. F. Portland Ore.
DIRSTINF P. H. Pullman Wash.
DREITZKA SYLVESTER H. S. Milwaukee Wis.
DUBOIS CHARLOTTE F. Catskill N. Y.
DUMEZ A. G. Mr AND MRS. Baltimore Md.
DUNCAN E. E. Mr AND MRS. Oklahoma City Okla.
DUNN MARIN S. Philadelphia Pa.
DYE CLAIR A. Mr AND MRS. Columbus Ohio.

EBERLE E. G. Mr AND MRS. Washington D. C.
EBY FRANK H. Philadelphia Pa.
ELWOOD H. S. Ellensburg Wash.
EMANUEL LOUIS Mr AND MRS., Pittsburgh Pa.
ENGELKING MRS. A. G. AND DAUGHTER San Antonio Texas
EVANS CHARLES E. Warrenton Ga.
EVANS CLAIRE Seattle Wash.

FEEHAN MARTIN E. Lewiston Idaho
FISCHELIS R. P. Mr AND MRS. Trenton N. J.
FISCHER E. B. Minneapolis Minn.
FISCHER LOUIS Seattle Wash.
FLEMING FRED D. Los Angeles Calif.
FLEMING R. W. Reno Nevada
FORD M. N. Mr AND MRS. Columbus Ohio
FOSS E. S. Mr AND MRS. Preston Idaho
FREERICKS F. H. Mr AND MRS. Cincinnati Ohio
FUHRMANN CHARLES J. Mr AND MRS. Washington D. C.
FULTON WM. M. San Francisco Calif.

GARVIN ALICE E. New Haven Conn.
GATHERCOAL E. N. Chicago Ill.
GAYLE J. W. Frankfurt Ky.
GEUE F. A. Portland Ore.
GILBERT C. T. Noroton Conn.
GILFILLAN T. A. Corvallis Ore.

GILLIS E Columbus Ohio
GLEASON Mrs E E Stockton Calif
GLOVER C C Mr AND Mrs Ann Arbor Mich
GOODRICH F J Seattle Wash
GOODRICH ROBIN Seattle Wash
GRAY Wm Chicago Ill
GRILL F Portland Ore
GUNTHER EARL Mr AND Mrs Portland Ore
GUSTAFSON J C Mr AND Mrs Hartford Conn

HAHN E T Mr AND Mrs Philadelphia Pa
HAMMOND E L, Mr AND Mrs University Miss
HANKINS W M Daytona Beach Fla
HARRIS C C Mr AND Mrs Houston Texas
HARRIS L E Mr AND Mrs Norman Okla
HAYES PEYTON Portland Ore
HAYMAN J L Morgantown W Va
HEIDENREICH A C Seattle Wash
HEIN H F Mr AND Mrs AND SON San Antonio Texas
HENRICKSON G F Camas Wash
HENRY H A Los Angeles Calif
HILTON S L Mr AND Mrs Washington D C
HUCH QUINTUS Mr AND Mrs Philadelphia Pa
HOCKING GEORGE M Mr AND Mrs Portland Ore
HOLLOWAY JESSIE D Mr AND Mrs Liverpool Ohio
HUSA BILL Gainesville Fla
HUSA W J Mr AND Mrs Gainesville Fla

JACOBSEN THOMAS Seattle Wash
JENKINS GLENN L Baltimore Md
JOHNSON CARL H Seattle Wash
JOHNSON C W Mr AND Mrs Seattle Wash
JOHNSON FRED F Seattle Wash
JONES E L Portland Ore
JONES F M Cut Bank Mont
JONES LINN E Portland Ore
JONES ROWLAND JR Washington D C
JORDAN C B Mr AND Mrs La Fayette Ind
JORGENSEN P S Seattle Wash
JUDISCH GEORGE Ames Iowa

KELLY E F Mr AND Mrs Washington D C
KENDIG H E Philadelphia Pa
KESSLER W Portland Ore
KEVILLE F M Portland Ore
KIMMICH E Mr AND Mrs Detroit Mich
KLOHN F E Portland Ore
KRANTZ JOHN C Mr AND Mrs Baltimore Md

LACASSE D M Mr AND Mrs Missoula Mont
LAISEN J M Mr AND Mrs Portland Ore
LAMAR GEORGE W Memphis Tenn
LANGENHAN H A Mr AND Mrs Seattle Wash
LAUE F A Portland Ore
LAUE JOHN JR Portland Ore
LEACH J R Portland Ore
LEE CHARLES O La Fayette Ind
LEHMAN R S Mr AND Mrs Brooklyn N Y
LEMON A B Buffalo N Y
LINNETS O G Ontario Ore
LITTLE ERNEST Mr AND Mrs Highland Park N Y
LORRING E B Fallon Nev
LYMAN R A Lincoln Neb
LYNCH J J Portland Ore
LYNN E V Mr AND Mrs Newton Mass

McCLOSKEY J F New Orleans La
McCREAL J F Portland Ore
McCULLOUGH F V New Albany Ind
McGINNIS FRANK McKees Rocks Pa
McGINNIS W O Mr AND Mrs McKees Rocks Pa
McKIBEL Mrs ELSIE Brooklyn N Y
MACLELLIN Mrs L J B St Louis Mo
MARR LEON H Farmington Me
MARTIN EDGAR P Hazen N Dak
MASSE Wm Seattle Wash
MATSUISHIMA SUBEO TACOMA Tacoma Wash
MAYER EDWIN E Mr AND Mrs Portland Ore
MERRILL C G Mr AND Mrs Cincinnati Ohio
MICKELSEN A O Mr AND Mrs Portland Ore
MILLIGAN NED Oklahoma City Okla
MOLLETT C E Mr AND Mrs Missoula Mont
MORTENSON FRANK Los Angeles Calif
MOTLEY E T Mr AND Mrs Columbia S Car
MOULTON GEORGE Peterborough N H
MUELLER N R Hermiston Ore
MUESING Wm C New Ulm Minn
MULLIGAN J N Topeka Kans
MURPHY E J Manchester Conn
MURRAY J H B Salt Lake Utah

NAU FRANK Portland Ore
NEELY J H Baltimore Md

NILRS EDWARD H Indianapolis Ind
NISHIO MARIKO Milwaukee Ore

O CONNELL C L Mr AND Mrs Pittsburg Pa
O HARROW E A Mr AND Mrs Bloomington Ind
OTA MINNIE S Seattle Wash
OTSUKI CHICKO Portland Ore

PARADONSKY J Mr AND Mrs Kansas City Kansas
PATTERSON W D El Reno Okla
PERFIELD MONICA Portland Ore
PETERSON ALEX F JR Missoula Mont
PHILLIPS R E Mr AND Mrs San Antonio Texas
PILCHARD H D Mr AND Mrs Seattle Wash
POE C F Boulder Colo
PORTERFIELD W P Fargo N Dak
PROCHASKA E J Pine City Minn

RAABE M R Ada Ohio
RAABE R H Mr AND Mrs Ada Ohio
REDDISH G F St Louis Mo
RHODES W Portland Ore
RICHARDS LEON W Missoula Mont
RISING L W Mr AND Mrs Seattle Wash
RIVARD A L Missoula Mont
ROBERTSON R V Mr AND Mrs Spokane Wash
RODMAN R W New York City
ROSIN L Plainfield N J
ROWE L W Mr AND Mrs Detroit Mich
ROWE T D Missoula Mont
RUDD W F Mr AND Mrs Richmond Va
RUDDUCK HERBERT INMAN Mr AND Mrs Cham-
paign Ill
RUTHERFORD W E Santa Rosa Calif

SCHAEFER E K Yonkers N Y
SCHAEFER F C A Mr AND Mrs Brooklyn N Y
SCHAEFER HUGO H Mr AND Mrs New York City
SCHEDUBERG C H Portland Ore
SCHICKS G C Montclair N J
SCHLICHTING ARTHUR F St Louis Mo
SCHNAIDT H J Mr AND Mrs Parkston S Dak
SCHWARTZ C JR Seattle Washington
SERLES E R Brookings S Dak
SEVERIN C E Philip S Dak
SHEA T S Worcester Mass
SHULTZ R C Mr AND Mrs Worland Wyo
SHURTLEFF F C Wenatchee Wash
SKEELS H M Reno Nev
SNOW C M Mr AND Mrs Chicago Ill
SNYDER LOUIS E Philadelphia Pa
SPEASE EDWARD Mr AND Mrs Cleveland Ohio
STABLER LAIRD J Los Angeles Calif
STIPE EDGAR Portland Ore
STOVALL LAWRENCE S Mr AND Mrs Maupin Ore
STROUP FREEMAN P Philadelphia Pa
STUHR E T Mr AND Mrs Corvallis Ore
SUCHY J F Missoula Mont
SUGAIRO R E Portland Ore
SWAIN R L Batimore Md
SWISHER MARGARET C Buffalo N Y

TAYLOR VICTOR RAY Portland Ore
TEETERS W J Iowa City Iowa
TEMPLETON L Mr AND Mrs Chicago Ill
THOMPSON T C Mr AND Mrs Los Angeles Calif

UHL A H Madison Wis
ULSH ROBERT T Portland Ore

VARNUM W H Mr AND Mrs Lawrence Kans
VINCENT HUGH C Pullman Wash

WALTON L L Mr AND Mrs Williamsport Pa
WARD JUSTUS C Denver Colo
WARNACK ROY S Los Angeles Calif
WASHBURN H C Boulder Colo
WEIS HARRY L Portland Ore
WENZ BELLE Pullman Wash
WHEPLEY Mrs L E St Louis Mo
WHITE Mrs MAX Spokane Wash
WHITNEY H A K Ann Arbor Mich
WILSON A P Mr AND Mrs Portland Ore
WILSON R C Mr AND Mrs Athens Ga
WINNE A L Richmond Va
WITTY JOHN Portland Ore
WULLING FRED J Minneapolis Minn

YOUNGKEN H W Boston Mass

ZIEFLE ADOLPH Mr AND Mrs Corvallis Ore
ZIMMERMAN ALBERT Mr AND Mrs Peoria Ill
ZIMMERMANN C J Peoria Ill

ASSOCIATION BUSINESS

AD INTERIM BUSINESS OF THE COUNCIL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, 1934-1935

Office of the Secretary 2215 Constitution Ave., Washington, D C

LETTER NO 21

July 19, 1935

To the Members of the Council

107 *Printing and Binding the Recipe Book II* Motion No 35 (Council Letters 19, page 581, and 20, page 583) has been carried and the contract is awarded to the Mack Printing Company

108 *Election of Members* Motions Nos 36 and 37 (Council Letters 19, page 582, and 20, page 583) have been carried and applicants for membership numbered 219 to 261, inclusive, are declared elected

109 *Distribution and Sale of the National Formulary VI and the Recipe Book II* The following communication has been received from Chairman DuMez of the Committee on Publications

"Invitations for Bids for the Distribution and Sale of the National Formulary, Sixth Edition, and of the Recipe Book. Second Edition, were recently issued in accordance with Motion No 13 (Council Letter No 8, page 1245), to the following firms to whom invitations for Bids for the Distribution and Sale of the U S P XI were sent at the same time

William Wood & Co, 51 Fifth Ave, New York, N Y
W B Saunders & Co, W Washington Square, Philadelphia, Pa
P Blakiston's Son & Co, 1012 Walnut St, Philadelphia, Pa
Lea & Febiger, 706 Sanson St, Philadelphia, Pa
J B Lippincott Co, E Washington Square, Philadelphia, Pa
D Appleton & Co 29 W 32nd St, New York, N Y
William F Fell, 1315 Cherry St, Philadelphia, Pa
William J Doran, 7th & Arch Sts, Philadelphia, Pa
McGraw-Hill Publishing Co, 320 W 42nd St, New York, N Y
Mack Printing Company, Easton, Pa

' It will be recalled that these firms were requested to bid \$3 34 per copy and additional on the N F VI and the R B II, in buckram binding and \$4 67 per copy and additional on the N F VI in leather binding

"Bids were received from the Williams and Wilkins Company, P Blakiston's Son & Co, and the Mack Printing Company Several of the firms declined to bid

' The bid of the Mack Printing Company is the highest at \$3 34 plus 25 cents or \$3 59 per copy for the N F VI and the R B II in buckram binding, and \$4 67 plus 40 cents or \$5 07 per copy for the N F VI in leather binding and is identical with their bid for the U S P XI This company also agrees that transportation charges will be prepaid on all copies sold at the full retail prices and have listed twenty-two publications in which the books will be advertised, which are satisfactory

"The Board of Trustees has accepted the bid of the Mack Printing Company for the distribution and sale of the U S P XI In addition to the large return to the A P H A which their bid will yield, there are advantages to be expected from having the same firm distribute and sell the U S P XI N F VI and R B II especially as this firm is printing and binding the books

"It is believed that the Mack Printing Company is sufficiently experienced through its various connections, to carry out the contract successfully and I recommend that the contracts for the distribution and sale of the N F VI and R B II be awarded to the firm on the basis of its bid "

(*Motion No 38*) *It is moved by DuMez that the contracts for the distribution and sale of the National Formulary VI and the Recipe Book II be awarded to the Mack Printing Company, Easton, Pa, on the basis of their bid*

Chairman DuMez requests that a vote be called for at this time in order that, if possible, the contracts may be completed promptly. The vote will be considered as tentative if there is objection or if any member of the Council desires to comment or to have additional information.

110 *Applicants for Membership* The following applications properly endorsed and accompanied by the first year's dues have been received:

No 262, Nicholas B Solonen 615 E 4th St, Muscatine, Iowa, No 263, Geo Roeder, P O Box 131, Rahway, N J, No 264, John C D'Arienzo 131 Sheridan Ave, Paterson N J

(*Motion No 39*) *Vote on Applications for membership in the American Pharmaceutical Association*

E F KELLY, *Secretary*

LETTER NO 22

August 3, 1935

To the Members of the Council

The Second Meeting of the Council for 1934-1935 was held at Multnomah Hotel, Portland, Oregon, on Saturday August 3 1935, beginning at 10 20 A M, with the following members present: Hilton, Fischelis, Beal, Army, Christensen, Adams, Geo D Beal, Eberle, DuMez and Kelly.

111 *Election of Members* The secretary reported that Motion No 39 (Council Letter No 21, page 682) had been carried and that applicants for membership numbered 262-263 and 264 are declared elected.

112 *Minutes of the Council* On motion of Army—Adams, the minutes as printed in the JOURNAL were accepted.

113 *Use of Text of N F VI* The following letter from Secretary Leech of the Council on Pharmacy and Chemistry of the American Medical Association was read:

July 18, 1935

Please convey to the Council of the AMERICAN PHARMACEUTICAL ASSOCIATION the grateful appreciation of the Council on Pharmacy and Chemistry for permission to use certain portions of the text of the National Formulary, Sixth Edition, in the forthcoming editions of:

Useful Drugs

Epitome of the U S Pharmacopœia and National Formulary

Hospital Practice for Interns

This is to be without charge.

It is understood of course that the publications including this text will not appear until after the National Formulary VI is issued and furthermore that the suggested statement of permission will appear on the back of the title page.

(Signed) PAUL NICHOLAS LEECH, *Secretary*
Council on Pharmacy and Chemistry

114 *Committee on Finance* The following letter and report from Chairman Philip were read:

July 29, 1935

It is with deep regret that I am forced to be absent from the council and the meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION held this year in Portland, Oregon.

To members of the council I send greetings. I know the council's deliberations will be in the interest of the AMERICAN PHARMACEUTICAL ASSOCIATION, the Profession of Pharmacy and in the activities of our ASSOCIATION from the new magnificent Headquarters Building here in Washington.

(Signed) W BRUCE PHILIP

The Committee on Finance respectfully submits to the Council the usual summary of receipts and disbursements for the first six months of the year

It is to be noted that the estimated budget for 1935 was fairly accurate as to receipts and disbursements \$16,002 40 has been received, and \$15,625 82 paid out

No budget allowance for the year has been exceeded during this period and the majority of the budget allowances will carry the respective expenses for the year It is to be expected that items such as the National Formulary will just prior to the issuance of a new volume, be low in receipts and proportionately higher in expense

There are also other items as fuel, when the expense is heavier in the winter months

In addition to this brief summary of budget receipts and disbursements, the Committee desires to report to the Council with respect to the sale and transfer of the following bonds Under the Second and Third Calls, October 15, 1934 and April 15, 1935, \$21,800 00 in Fourth Liberty Loan 4 1/2% Bonds were called for payment Under authority of the Council, the secretary and treasurer of the ASSOCIATION exchanged the bonds for U S Treasury 2 7/8% Bonds with the exception of three \$100 00 bonds in the Endowment, Centennial and Procter Monument Funds respectively, which were cashed and three \$1000 00 bonds in the Life Membership Fund which were cashed and the proceeds transferred to the Current Fund—one in the fall and two in the spring It was necessary to pay a premium of 1 2 /8 on the \$6000 00 bonds subject to the second call, the \$12,500 00 bonds subject to the third call were exchanged on an even basis

The treasurer is keeping a separate account of all investments for the Headquarters Building property and equipment The amount to July 31, 1935 was \$572,196 07

On motion Adams—Geo D Beal, the report was accepted and filed

115 Committee on Property and Funds Chairman Fischelis read the following report

ARTICLE III of Chapter II of the By-Laws of the Council provides that this committee 'shall have charge of the administration of all the property and established funds of the ASSOCIATION' and that "the committee shall consider applications for grants from the interest derived from the established funds and at as early a date as possible shall report to the Council such recommendations as may be deemed proper " The personnel of the committee is definitely provided for in the By-Laws of the Council and consists of the President the Treasurer, the Chairman of the Council, the Chairman of the Committee on Finance and the Secretary of the ASSOCIATION

The report of the treasurer presents, in detail, the status of the various funds which have been established from time to time for specific purposes under the custody, or administration, of the AMERICAN PHARMACEUTICAL ASSOCIATION We have been advised by one of the Executors of the estate of the late Frederick B Kilmer that a bequest of \$3000 00 has been made by him to the AMERICAN PHARMACEUTICAL ASSOCIATION in Clause 6 of his will which reads as follows

6 I give and bequeath unto the AMERICAN PHARMACEUTICAL ASSOCIATION, organized under the District of Columbia, the sum of Three Thousand Dollars to be held in trust, the income to be applied to the awarding of a prize for meritorious work in pharmacognosy, such prize to be known as 'The Kilmer Prize,' or an equivalent designation In awarding the prize preference to be given to studies in vegetable drugs The recipient of the prize shall be a graduate in pharmacy Teachers in colleges of pharmacy workers in pharmaceutical laboratories, are to be excluded from competing for the prize Prize to be awarded under such conditions as the ASSOCIATION may elect Funds arising from the income which may not be used are to be added to the amount of the prize or added to the principal, as the ASSOCIATION may elect "

To date the estate has not been finally settled so the bequest has not been officially received It is likely however, that it will be received in time for an award to be made under the provisions of the bequest by the time of our 1936 convention The committee therefore recommends that an announcement of the nature of the bequest be made at one of the General Sessions of the Portland Convention and at one of the meetings of the Scientific Section and the Section on Practical Pharmacy and Dispensing, respectively The Committee further recommends that if there is to be established in the ASSOCIATION a permanent Commission on Awards, this Commission be instructed

to set up the necessary rules and regulations for carrying out the desires of the donor and that the award be known as the Kilmer Prize "

It is further recommended that notice of the establishment of the Kilmer Prize and rules governing its award be furnished all State Pharmaceutical Associations and other groups of pharmacists whose members may be stimulated to carry on researches along the lines contemplated by Dr Kilmer

No applications for grants from the interest derived from the established funds have been referred to the Committee

In this connection the chairman desires to raise the question as to the scope of the duties of the Committee in the light of our recently acquired building If this Committee is to have charge of the administration of all property" of the ASSOCIATION, as indicated in the By-Laws, it must be looked upon as the Committee on Administration of the headquarters building If, on the other hand, such administration is not contemplated, then the By-Laws should be changed or definitely interpreted on this point At any rate there should be some constituted authority with respect to the management and administration of the building The Council should definitely dispose of this question at once

Following the precedent of former committees we recommend the following banks and safe deposit vaults as depositories for funds, securities and records of the ASSOCIATION

DEPOSITORIES FOR FUNDS

The Baltimore Trust Company, Baltimore, Md
 The Baltimore National Bank, Baltimore, Md
 The Maryland Trust Company, Baltimore, Md
 The Merchants and Newark Trust Co , Newark, N J
 The Boston Penny Savings Bank, Boston, Mass

DEPOSITORIES FOR SECURITIES AND RECORDS

The Baltimore National Bank, Baltimore, Md —Safe Deposit Boxes
 The Maryland Trust Company, Baltimore, Md —Safe Deposit Boxes
 The Merchants and Newark Trust Co , Newark, N J —Safe Deposit Boxes

The report was received and the recommendations taken up seriatim on motion Army—Geo D Beal

Kilmer Prize On Motion of Adams—Christensen, the three recommendations with respect to this prize were approved

Headquarters Building It was moved by DuMez—Army that the administration of this property be under the Committee on Property and Funds in accordance with the By Laws of the Council

Depositories The depositories recommended were approved on motion Eberle—DuMez

The report of the chairman was then approved as a committee report on motion of Army—DuMez

116 Committee on Publications The following report was read by Chairman DuMez

Your Committee on Publications respectfully submits the following report on its activities for the year 1934—1935 and on the status of the publications of the ASSOCIATION

"Journal" The total expenditures for the publication of the JOURNAL for 1934 including the Editor's salary were \$19,236 50 (\$14,236 50 + \$5000 00) This is \$1023 55 more than was expended the preceding year the amount expended for this purpose in 1933 being \$18 212 95 (\$13,212 95 + \$5000 00)

"The receipts of the JOURNAL for advertising, subscriptions, sale of single copies, reprints etc , for 1934 were \$9289 34 which is an increase of \$1389 34 over the preceding year when the receipts were \$7900 00 The subscription credit received from non headquarters building members, less 20% for overhead amounted to \$4235 14 making a total of \$13 524 48 The total receipts for 1933 were \$12 234 26

"The total expenditures of \$19 236 50 less the total receipts of \$13 524 48 give \$5712 02 as the net cost of the JOURNAL for 1934 The net cost for 1933 was \$5978 68 A reduction of \$266 66 was therefore effected in 1934 and is to be attributed mainly to gains made in the sale

of subscriptions to the JOURNAL, single copies, reprints, etc., rather than to an increase in income from advertising

"The contract for publishing the JOURNAL was again awarded to the Mack Printing Company of Easton, Pa., on the basis that the award be made to the lowest bidder, and because of satisfactory service which this firm had given us in the past

"Beginning with the March issue for this year (1935), there has been published monthly in the JOURNAL a section of approximately 36 pages of Pharmaceutical Abstracts. This new feature recommended by the special committee appointed several years ago to study the matter and adopted by the ASSOCIATION in convention last year appears to have been well received by the users of the JOURNAL, if the favorable comments on the new section received by Editor Eberle and your chairman may be used as a basis for forming an opinion. The new arrangement would seem to appeal particularly to teachers and research workers and should result in some increase in the number of JOURNAL subscriptions

"The foregoing constitutes the first step in the inauguration of the new policy of the ASSOCIATION with respect to the publication of the JOURNAL and the YEAR BOOK. We have discontinued the YEAR BOOK as such and have added a section on Pharmaceutical Abstracts to the JOURNAL. The next step is the publication of a new popular type of journal which will appeal to the rank and file. In addition to items of interest to the average pharmacist, such a journal would carry all of the miscellaneous material published in the present journal, thus making available additional space for the publication of scientific and professional papers

"*Year Book* Volumes 21 and 22 of the YEAR BOOK of the ASSOCIATION covering the years 1932 and 1933 have been printed and distributed since the last annual meeting which leaves only the preparation of the report of the Reporter on the Progress of Pharmacy for 1934 to complete the series. The work on the preparation of the latter which will constitute Volume 23 of the series of YEAR BOOKS is more than half completed at this time and it is expected that the book will be ready for distribution about the first of the new year

"The contract for printing, binding and distributing these volumes was again awarded to the Lord Baltimore Press of Baltimore, Maryland, because the estimates of this firm on the cost of doing the work were the lowest in both instances. Two thousand copies of Volume 21 were ordered and 1750 copies of Volume 22. Up to the present time only 1100 copies of the latter have been distributed

"The sum of \$1000.00 to be used in defraying a part of the cost of preparation and publication was again contributed by the Board of Trustees of the United States Pharmacopœial Convention

"Copies of the YEAR BOOKS Nos. 1-5, 7-12 and 14-21, were donated to the Library of Congress by authority of the Council

"*National Formulary V* Up to June 30, 1935 a total of 51,051 copies of the National Formulary V were printed and bound, 50,551 in buckram and 500 in leather. Of the total number of copies bound in buckram 50,000 were sold and 88 were distributed as complimentary copies. Of the copies bound in leather, 103 were sold and 12 were given away. The remaining 463 copies bound in buckram and the 385 copies bound in leather constituted the stock on hand as of June 30, 1935

"Permission to use portions of the text of the National Formulary V for comment in other publications was granted to the following: School of Medicine of Duke University, for use in the preparation of a Hospital Formulary, J. B. Lippincott Co., for the publication of a textbook on prescription writing by Dr. Charles Solomon, Morris Dauer for use in the preparation of a 'Formulary for Physicians'. Permission was granted to the American Medical Association to use portions of the text of the National Formulary VI for comment in 'Useful Drugs,' 'Hospital Practice for Internes' and 'Epitome of the United States Pharmacopœia and the National Formulary'. The foregoing permission was granted with the definite understanding that no comment would be published until after the appearance in print of the new edition of the National Formulary

"The contracting for printing and binding the National Formulary VI was awarded to the Mack Printing Company in August 1933, but no provision for the sale and distribution of the book was made at that time. This matter has, however, been given consideration during the past several months. Invitations were sent out to the publishers qualified to handle the job to submit

estimates on the cost of sale and distribution, and on the basis of the estimates received, the chairman of the Committee on Publications recommended to the Council that the contract be awarded to the Mack Printing Company. A vote has been called for and it is hoped that it will be favorable because there is not much time remaining before the expected date of appearance of the new book.

'Pharmaceutical Recipe Book' Up to June 30, 1935, a total of 5506 copies of the Pharmaceutical Recipe Book were printed and bound in buckram. Of this number 5345 copies were sold, 101 were distributed as complimentary copies and 60 copies remained as stock on hand. Since July 1st, the stock on hand has been sold and the chairman of the Committee on Publications recommended that an additional 125 copies be ordered printed and bound.

"The contract for printing and binding the new edition of the Recipe Book was awarded to the Mack Printing Company as you will recall. The contract for its distribution and sale will be awarded to the firm receiving the contract for the distribution and sale of the National Formulary."

Complete information on the status of revision of the Recipe Book cannot be given you at this time. Suffice it to report that satisfactory progress is being made in the revision, of the formulas and other parts of the text. In fact, Chairman Lascoff of the Committee on Recipe Book contends that, except for some work still to be done on a few formulas and the alteration of certain titles to make them conform to the recommendations of the Food and Drug Administration of the U. S. Department of Agriculture, the book is ready for the printer. That being the case, it is believed that publication will be proceeded with promptly.

The report was received on motion of Fischelis—Geo. D. Beal.

117 *Contract for the Distribution and Sale of the N. F. VI and R. B. II* The secretary reported that Motion No. 38 (Council Letter No. 21, page 681) had received a majority vote and that President Fischelis had requested that final action be deferred until this meeting of the Council. After a full discussion, the action of the Council in awarding the contract to the Mack Printing Company, Easton, Pa., was affirmed on motion Beal—Army.

118 *Committee on Year Book* Chairman Geo. D. Beal submitted a verbal report approving the transfer of Pharmaceutical Abstracts to the JOURNAL.

The report was approved on motion Christensen—Kelly.

119 *Editor of the Year Book* Editor DuMez read the following report:

Volumes 21 and 22 of the YEAR BOOK covering the years 1932 and 1933, respectively have been published since the meeting held in Washington in May of last year. This leaves one more book still to be prepared to complete the series up to the time when the publication of Pharmaceutical abstracts was begun in the JOURNAL. When this volume is published the YEAR BOOK in its present form will be discontinued. The book in its present form contains some useful features and I have no doubt that its passing will be missed by many. As a vehicle for carrying the report of the Reporter on the Progress of Pharmacy however, it has outlived its usefulness by many years. The large majority of workers who use the material carried in the report of the Reporter on the Progress of Pharmacy want it immediately after the publication of the original article and they are not willing to wait a year or two for it as they have been compelled to do where they have depended upon the YEAR BOOK.

The preparation of this volume which will be the YEAR BOOK for 1934 is well under way. About two thirds of the abstracting has already been done and I have the assurance of my collaborators that the remaining abstracts will be completed within the next 60 days. The book should therefore be ready for distribution sometime in the early part of next year depending on the rapidity with which the printer handles the job.

"The publication of the report of the Reporter on the Progress of Pharmacy in monthly installments in the JOURNAL was begun in March of this year and met with a favorable response immediately, if the letters of commendation I have received may be taken as a true criterion. We began with a staff of 30 abstractors and with the expectation of publishing 32 pages of printed matter each month. The staff has since been increased to 36 abstractors and the number of pages of printed material has been increased to 36. Up to and including the July issue of the JOURNAL a total of 176 pages of Abstracts have been published. It is quite probable that it will be necessary to make another increase in the number of pages published very soon as we are still enlarging our field of the literature that is being covered. If we should undertake to cover thoroughly

some of the fields closely related to pharmacy, the field of cosmetics, for instance, the increase in the number of pages would be very much greater

"While we are on this subject, it may be mentioned that an approach has been made to determine if our ASSOCIATION would be willing to undertake to abstract the literature on cosmetics. The cosmetic industry has grown enormously in the past two decades, and they are searching about for some organization to undertake to do this work for them. It may be that we should give this matter serious consideration at this time.

"In setting up a working arrangement for getting out these monthly Abstracts it was agreed that we would pay the abstractors at the rate of \$2 00 per printed page of abstract made from articles published in English, and \$3 00 per printed page for abstracts of articles published in a foreign language. We did not, however, agree on the time of making payments for the work done. This matter has been brought to my attention by several of our abstractors, it has been discussed with Secretary Kelly and it is recommended that hereafter payments be made quarterly.

"Your attention is also called to the fact that when the Council agreed to discontinue the YEAR BOOK in its present form, it also declared that the ASSOCIATION data, membership rolls and index would be carried in the JOURNAL so that those desiring to do so could bind this material together with the Abstracts and thus continue the series of YEAR BOOKS. This will require a total of approximately 70 pages exclusive of the index. It is recommended that the Editor of the JOURNAL be given authority to proceed with the publication of this material promptly so that the matter of authority will not be a factor in holding up publication at the end of the year."

On motion of Adams—Army, the report was received and the recommendation that the literature on cosmetics be abstracted for publication in connection with the Pharmaceutical Abstracts was referred to the Committee on Cosmetics for investigation and recommendation.

The Incoming Committee on Publications was requested to submit a recommendation with respect to the publication of the ASSOCIATION material including the roll of members, heretofore published in the YEAR BOOK, on motion of Fischels—Christensen.

120 *Editor of the Journal* Editor Eberle read the following report:

"The report of the Editor herewith deals with the business of 1934 and as report of previous years, is compared with the prior year, 1933.

The expenses of the JOURNAL for 1933 were \$13,212 94, the receipts were \$7900 00. Deducting the receipts, not including membership subscriptions from expenses shows a net cost of \$5312 94. Add the Editor's salary and we have a cost of \$10,312 94. The credit on membership subscriptions, not Headquarters members, less 20% for overhead, which for 1933 is \$4334 26 from the gross cost, \$10,312 94, leaves \$5978 68 net cost, including the Editor's salary.

"The total expenditures for the publication of the JOURNAL, for 1934, including the Editor's salary, were \$19,236 50 (\$14,236 50 + \$5000 00). The total expenditures for 1933 were \$18 212 94 (\$13,212 94 + \$5000 00), which represents an increase of expenditures for 1934 of \$1023 56.

"The receipts of the JOURNAL for advertising, subscriptions, sales of single copies, reprints, etc., for 1934, were \$9289 34. The subscription credit received for 1934 non-headquarters building members, less 20% for overhead, amounted to \$4235 14 making a total of \$13,524 48. The total receipts for 1933 were \$12,234 26. The receipts for 1934 have, therefore, increased by \$1290 22.

The total expenditures for 1934 of \$19,236 50, less the receipts of \$13,524 48 show the net cost of the JOURNAL for 1934 to be \$5712 02. The net cost for 1933 was \$5978 68. The net cost of the JOURNAL has, therefore, decreased by \$266 66 in 1934 over the preceding year (1933).

'The number of pages in 1933 was 1310, in 1934, 1256. The publication costs in 1933, \$9107 44, in 1934, \$9300 13. Mailing costs of the JOURNAL in 1933, \$599 51, in 1934, \$572 45, mailing back numbers of the JOURNAL for 1933, \$26 50, in 1934, \$31 20. Engravings and photographs, other than included in Mack Printing Company account in 1933, \$387 06, in 1934, \$552 39. Binding JOURNALS in 1933, \$25 75, in 1934, \$21 00, stationery and office supplies in 1933, \$69 20, in 1934, \$214 62, clerical, in 1933, \$1242 00, in 1934, \$1173 00. Commissions on advertising in 1933, \$488 22, in 1934, \$407 41. Small miscellaneous items make up the remainder of the total expenses.

"Detailed comparative receipts 1933 and 1934. The receipts for 1933, \$7900 00, for 1934, \$9289 34. Advertising in 1933 brought \$5241 92, in 1934, \$4942 29. Subscriptions in 1933 amounted to \$903 53, in 1934, \$1216 26, it should be understood that we make every effort possible to bring subscriptions to memberships. Single copies in 1933, \$28 51, in 1934, \$73 51. Re

prints, in 1933, brought \$1038 79, in 1934, \$834 05, Professional Pharmacy, \$1596 66, Miscellaneous items amounted to \$687 25 in 1933, in 1934, \$637 15 The American Association of Colleges of Pharmacy contributed \$300 00 in 1933 and the same amount in 1934 The Conference of Pharmaceutical Association Secretaries contributed \$25 00 in 1933 toward the expenses of printing their minutes in the JOURNAL and a like contribution was made in 1934 The Conference of Law Enforcement Officials contributed \$75 00 in 1933 and \$50 00 in 1934

"A number of reproductions of pictures and books have been made without cost to the JOURNAL and ASSOCIATION, and the sum derived from the sales of these was contributed to the JOURNAL—"The Laboratory," "Dr Power in His Laboratory," "Ground Breaking at Headquarters" Proof Sheets of United States Pharmacopœia I, "New Nomenclature"

"In recent years the papers presented to the Sections have increased in number and some in the pages of the reports, as a result we had quite a number of unpublished papers, most of which have now been published

As stated in the last report, among the papers in recent years have been those presented in partial fulfillment of work for degrees As then stated, it has occurred to the Editor that part of the expenses for papers of that type should be met by the authors There are two sides to the question, of course Another expense that should, perhaps in part be met by authors is when a large number of cuts are used Tabular matter should be summarized to an extent The JOURNAL has carried the expense of having reprints made of reports and minutes of meetings in connection with the annual convention for distribution at the sessions of the ASSOCIATION and for pharmaceutical publications Also, abstracts have been mimeographed for like distribution, more than one hundred have been prepared

'A work of interest and value has been published, 'The Professional Pharmacy—An Analysis of Prescription Department Activities,' by Frank A Delgado and Arthur Kimball It is part of the National Drug Stores Survey and published under and by authority of the U S Department of Commerce, Bureau of Foreign and Domestic Commerce Ten thousand copies of these have been published and sold and the amount received has paid for making them, and also for publication costs Fine publicity has been given by most of the pharmaceutical publications A revision of Professional Pharmacy is in process

"The contribution of the American Association of Colleges of Pharmacy is appreciated and thanks are extended to Dean C B Jordan, editor of the Department, for his cooperation Also to the Conference of Pharmaceutical Association Secretaries and Conference of Law Enforcement Officials

'On account of the code the printing cost of the JOURNAL was increased by nearly 10% The Editor advised the Publication Committee to this effect in the monthly report for June 1934, and again in the July report 1934 after investigation that it was necessary to comply with the code and further advising that under these rates the publication costs for the June issue were \$905 12 against \$976 51 somewhat less than 10% The code costs have been kept up since then Another item that changed the cost slightly up to June 1935—Mack Printing Company gave us the advantage of their old price on cover stock The supply was exhausted with the June issue so that we are now paying \$3 20 per month more for covers There has been a slight increase in engravers' prices however their prices were adopted before the code went into effect (in 1932)

As stated we have been watching the corners so that the net costs as shown by the report were slightly less in 1934 than in the previous year, however, those of the first six months of 1935, due largely to the code are \$295 98 greater than up to July 1, 1934

"The Abstract Section cost of the JOURNAL has averaged about \$230 00, however, this does not take into account the higher mailing cost, some of the engravers' plates of the Abstract Section and other minor items, which we did not think of sufficient importance to detail as after all it is ASSOCIATION cost We are confident from corresponding that the Abstract Section has met with favor We wish to thank Editor DuMez for the fine cooperation he and his co workers have given us and also the Mack Printing Company

"Extended detail would increase the length of this report The report of the Editor is made monthly to the Publication Committee annually a scheduled report is made of Receipts and Expenses, Itemized Reports are given to the secretary for the Auditor's Report and all bills are receipted before going to the secretary

"The Editor is thankful for the fine coöperation given him "

On motion Adams—Army, the report was received and discussion of it deferred until the afternoon session

Later, the report was approved on motion Adams—Army

121 *Committee on National Formulary* The following report was read by Chairman Gathercol

"*Progress of the Revision* —The copy for the page proof has been largely completed and forwarded to the printer. The page proof, in 64-page forms, is being issued, and we trust will be distributed by the first of September. The page proof represents the completed copy of the Revision, with the exception of a few monographs in the Tablets, possibly one ointment monograph, the section on General Tests, Reagents, etc (which is largely referred to the similar section in the U S P XI), and the Index. It is expected that these unfinished portions will be ready by the first of September, or as soon as the U S P page proof has advanced to the point where we can use it for reference purposes.

"We have published more than 500 pages in the N F Bulletin and the Sub-committee Letters during the past year. A very large amount of correspondence has been handled, and we have completed the reading of the corrected galley proof.

'The galley proof first began to appear in December 1934, and was completed in June 1935. The galley proof was distributed according to the Sub-committee assignments. For example, all of the galley of the crude drug monographs was distributed to Sub committee No. 1 on Pharmacognosy, including the auxiliary members and all of those who had had any part in the preparation of the monographs. Likewise, the chemical monographs went to Sub committee No. 2 and all who were particularly interested in the chemistry of the N F. In this way, all of those who were interested in any particular phase of the work had opportunity to carefully scrutinize that portion of the galley proof in which they were best trained. Of course all of the *Committee members* received the entire galley proof.

"The returns from the galley proof were unusually good. We kept a record of that which was sent out and returned, and found that the returns were fully 90 per cent. Many of the returns had been very carefully read, many of them contained valuable criticisms and some of them many valuable criticisms. All told about 7000 criticisms were returned on the galley proof. The chairman and his secretary carefully reviewed every one of these, and we were able to use about half of them. The result of these criticisms was a markedly improved text even though we felt that the text was as perfect as we could make it before it went into galley.

"In view of the fact that such abundant opportunity has been given for criticism, not only as regards the accuracy of the statements, but also as regards opinions on policy and suggestions on improved methods, we are restricting criticism on the page proof purely to matters of accuracy, and intend to make no changes that are not called for except for absolute corrections of error.

"*Financial Statement for the Year* —The summary of the financial statement for the year is attached.

NATIONAL FORMULARY COMMITTEE EXPENSES

July 1, 1934—June 30, 1935

Total, \$2716 85

<i>Bulletin & Sub-committee Letters</i>	\$738 22	
Mimeographing		577 00
Bull pp 1693-2140 and Index	495 00	
Sub committee No 3	10 00	
Sub-committee No 6	10 00	
Sub committee No 7	10 00	
Sub-committee No 8	44 00	
Sub-committee on Tablets	8 00	
Paper, 50 M punched		85 47
Binders, 75 blue		63 75
Lettering binders		10 00
Laces		2 00

<i>Chairman's Office</i>	1415 75	
Secretary Smith		810 00
Clerical help		7 05
Miss Otis, English reader		200 00
Postage		148 05
Letterheads and office supplies		32 40
Travel		194 55
Sundries		23 70
Telephone and telegraph	4 75	
Carfare	25	
Express	3 15	
28 meals	15 55	
<i>Chairman's Laboratory</i>	347 05	
Helpers		312 10
Supplies		34 95
<i>Sub committee Expenses</i>	43 70	
No 2 Supplies		6 43
Ampuls, travel to conference		37 27
<i>Exhibits</i>	172 13	
American Dental Association, St Paul		52 77
(U S Pharmacopœia		50 00)
American Medical Association Cleveland		101 00
Chicago Dental Society, Chicago		18 36
(Chicago Dental Society		40 00)
(University of Illinois College of Pharmacy		45 00)
<i>Remitted to Secretary Kelly</i>	\$62 25	
9 copies R Ingredient Survey		15 75
31 copies N F Bulletin, Vol V		46 50

The increase in the membership of the Committee to twenty is not requisite. Perhaps a decrease in membership to but ten would be more desirable with the appointment of one new member each year, or allow the membership to remain at fifteen and appoint one new member one year and two members the next.

' The following items should be considered in connection with the election of this committee.

' 1 Each committeeman should be chosen for ability to assume a definite assignment of the work or be a specialist in a particular phase of the work. Some consideration should be given to the geographical distribution according to type of institutions represented in the membership of the ASSOCIATION.

2 Provision should be made to retire any member of the Committee who is not willing or able to give full and careful attention to his duties in connection with the Committee work.

'3 Provision should be made to hold a meeting of the Committee at least once each year perhaps in connection with the annual meeting of the ASSOCIATION.

4 No salary should be paid to the Committee members but a policy of paying the necessary expenses of conducting the Committee work including the expense of individual members for attendance at the annual meeting of the Committee, should be manifested. If it be possible to pay a suitable honorarium at the time of retirement such a policy would be in order. An annual budget for the committee expenses should be prepared and presented to the Committee.

' The National Formulary is a great financial asset of the AMERICAN PHARMACEUTICAL ASSOCIATION. The financial value of this book can be materially increased provided due attention is given to its revision and to the development of its sale. The Council of the AMERICAN PHARMACEUTICAL ASSOCIATION should originate and definitely approve of policies looking to the continued development of this book leading to its increased popularity and sale. These policies and

principles of revision should be given to the Committee for its guidance and with the definite understanding that they are to be followed

"A few of the great questions of policy that the Council should now consider and definitely pass upon are as follows

"1 What is the purpose of the National Formulary? It was at first purely a retail pharmacist's formulary. An attempt was made to interest physicians in it, but there was nothing there to interest them and, even after fifty years, they have not become interested in it. It became a legal standard and this phase has been extensively developed. Now, however, it has lost much of its interest to the practicing pharmacist because of this legal development. How can it be made a complete legal standard (a necessity under the law) and, at the same time regain the interest of the pharmacist and acquire the interest of the physician? It is of great interest to the manufacturing pharmacist and as a textbook in the pharmacy colleges

"2 On what basis shall admissions be made to the National Formulary? Admissions never have been on a therapeutic basis, though perhaps nearer to it in this present revision than heretofore. The physician desires the National Formulary to assume such responsibility. Shall we do so? Admissions in earlier editions were exclusively preparations with working formulas, then non U S P simples used in National Formulary formulas were admitted and standardized, now non-U S P simples not used in National Formulary formulas are admitted and standardized. Are these correct policies? What shall be the new policies? Shall we admit formulas that provide substitutes for proprietary preparations? These are what the pharmacists want. Shall we admit the newest discoveries of simples and preparations? These are what the physician wants. Shall we admit new items annually and drop them if they fail to attain popularity with physicians? Shall we endeavor to develop new preparations and popularize them with physicians by advertising? Or must we always wait until the manufacturer has developed the preparation and popularized it before it can be 'officialized'?

It would seem desirable that the AMERICAN PHARMACEUTICAL ASSOCIATION Council, a body elected by the ASSOCIATION and representative of all phases of the A P H A membership should assume responsibility for answering these questions and many others of a similar nature

RECOMMENDATIONS

I Election of the Committee Members—A recommendation is made that the National Formulary Committee be increased to 20 members and that two members be elected each year to serve for 10-year terms. The Committee would then be a continuous body and there would be no abrupt change in policies and methods with the election of an entirely new committee as occurs under the present system. This new policy as regards the election of Committee members seems to be especially desirable in view of a gradual change in policy as regards the revision work. This change involves the issue of supplements and perhaps a new edition of the book itself more frequently than decennially

II Council Supervision of the N F Revision—The Council should maintain a somewhat closer supervision over the work of Revision and should take a greater responsibility for the revision. This perhaps can be done by reviewing annually and approving or re approving the General Principles of Revision for the guidance of the Committee

"III Continuance of the N F Revision Activities—It is recommended that the Council adopt a policy to the effect that the N F Committee continue an earnest and constructive study of the problems that have arisen in connection with the present revision, and that so far as possible these studies be expressed in supplements to the N F

'It is suggested that each sub committee (possibly reorganized) be urged to continue the study of definite problems. A few of these may be outlined as follows

'Sub-committee No. 1 (Pharmacognosy)

'(1) A careful review and consideration of each new vegetable or animal drug that is presented in the current literature for its possibilities as an official item

"(2) A study of the amount of foreign organic matter that is present commercially in each official crude drug

"(3) A careful review of the work done by Dr Newcomb on the inorganic matter in crude drugs, and a recheck of the inorganic matter in commercial crude drugs of to day

(4) A careful checkup of the official description of the crude drug and its structure as well as the diagnostic features of the powder

"(5) The evaluation of crude drugs by their volatile constituents, as determined by distillation "

' Sub committee No 2 (Chemicals)

' (1) Determine a permissible extent of moisture for each of the N F chemicals

"(2) Determine the approximate solubilities of each of the N F chemicals in a wider range of solvents

"(3) Study the N F organic chemicals for readily carbonizable substances

"(4) Study the N F organic chemicals for residue after ignition

' (5) Check all of the N F tests for identity and purity on commercial samples

' (6) Review and carefully consider each chemical that is presented in the current literature for its possibilities as an official item, for example, Colloidal Kaolin "

' Sub committee No 3 (Solution Preparations)

(1) The prevention of precipitation in elixirs

"(2) The preparation of elixirs by percolation

"(3) The possibility of preparing desirable liquid preparations of new chemicals that appear in the literature

"(4) A careful study of fruit syrups

"(5) A careful study of assays in connection with elixirs, solutions, syrups, etc

"(6) A careful check on present descriptions, tests and assay processes

"(7) A careful study of the new pepsin elixir monographs

(8) A study of Syrup of Glycyrrhizin "

"Sub committee No 4 (Extractive Preparations)

"(1) The application of Dr Husa's results on the official extractive preparations

"(2) Why have the extractive preparations lost their popularity with physicians?

' (3) Standardization of 'extractive' in these preparations

(4) Standardization of color, odor and taste in these preparations

(5) Tests of identity of these preparations "

Sub committee No 5 (Preparations for Internal Use)

"(1) Are there other effervescent salts that should be made official?

"(2) Are there alkalizing powders that should be made official?

' (3) Are there not many troches or candy tablets that might be considered for official standardization, such as phenolphthalein candy, etc

' (4) Shall capsule preparations be made official?

' (5) Assays of effervescent and non effervescent salts "

"Sub committee No 6 (External Preparations)

"(1) A study of dusting powders, douche powders and ointments from the antiseptic standpoint (Dr Kelly's foot powder)

"(2) The use of antiseptic dyes in ointments and solutions

"(3) Study the popularization of liquid and solid petroxolin as the basis of medication for external use

"(4) Study ointments and ointment bases especially in regard to the effect of varying temperatures and in regard to absorbability into the skin "

"Sub-committee No 7 (Miscellaneous Preparations)

"(1) Investigation of radium preparations

"(2) Investigation of sprays, inhalents and nose drops

'(3) Study the vitamin assays of cod liver oil emulsions

"(4) Study the colloidal character of phenolphthalein in liquid petrolatum emulsion "

"Sub-committee on Ampuls

"(1) Study carefully tests for the identity and purity of ampul solutions

(2) Study the sterility of ampul solutions

(3) Study preservatives, buffers and hydrogen ion concentration in ampul solutions "

"Sub committee on Tablets

(1) Study tests for the identity and purity of tablets

'(2) Study the general monograph for tablets including coatings, diluents, colorings, adhesives, etc

"(3) Study the solubilities of tablets, especially the test for the solubility of enteric coated tablets

"(4) Develop assays for popular tablets not now official "

' Sub-committee on Dental Products

'(1) Which products that are used by dentists in their practice or that can be prescribed by dentists for use by the patient are suitable for official standardization?

"(2) What standards are necessary for such products?"

"Sub committee on Veterinary Products

"(1) Which products that are used by veterinarians in their practice or that can be prescribed by veterinarians are suitable for official standardization?

(2) What standards are suitable for such products?"

' Special Sub-committee on Glandular Products

'(1) A study of assays for these products

'(2) A careful checkup of the histological features of these products

(3) A study of commercial products for adulterations

'(4) A study of these products for sterility "

"General Studies

(1) The scientific naming of colors as used in the U S P and N F in connection with crude drugs chemicals, preparations, tests etc

'(2) A comparative study of chemical assays of the same general nature

'(3) A careful study and checkup on all of the samples of the U S P and the N F to determine the possibility of presenting these samples in suitable preparations for the physicians' use, for example Solution and Ointment of Acriflavine (Dr DuMez, 4 9 35)

(4) A careful study and checkup on all of the titles and synonyms of the N F especially in view of the suggestions made by Dr A G Murray

'(5) A careful check of the alcohol content of all preparations containing alcohol "

"IV *The National Formulary Bulletin*—If the Council endorses the preceding recommendations, your chairman plans to carry on the National Formulary Bulletin It is now approaching the completion of its fifth volume that is, 2500 mimeographed pages To provide for the issuance of this Bulletin and the correspondence in connection with the continuance of the N F Revision, it will be necessary for the chairman to be provided with a secretary Miss Edith Smith, who has served as secretary for nearly two years, has been highly efficient and because of her constantly increasing knowledge of the details of this work becomes increasingly more valuable I would recommend that she be retained for the ensuing year at a salary of \$1000 00 payable monthly "

"V *N F Laboratory Work*—If the studies outlined in Recommendation III are to be properly carried out, a laboratory should be established at once where much of the control work could be handled We can establish such a laboratory at the College of Pharmacy without charge so far as rental, heat light, etc is concerned It may be possible to obtain the services of a capa-

ble pharmaceutical chemist for part time at a cost of not more than \$100 00 per month It would be necessary to provide the reagent supplies as well as to provide commercial samples, etc It is also possible that we may be able to obtain the services of two or three capable chemists through public works money Also research work can be assigned to graduate students in various institutions The laboratory space in mind is equipped so that four men can work together very comfortably It is recommended that the Council provide for such a laboratory until facilities can be provided at the A P H A building in Washington "

"VI N F Publicity—The popularization of the National Formulary to pharmacists and physicians is very important This should be directly in charge of an A P H A publicity director A reasonable percentage of the gross receipts from the sale of the A P H A publications should be set aside for this purpose The publicity should take the form of exhibits at Conventions, of 'U S P and N F propaganda' of JOURNAL articles, of addresses at meetings of physicians and of pharmacists and in various other ways that will develop "

VII *Honoraria to Committeemen*—While it is a well recognized maxim that voluntary service, such as has been given in connection with the U S P and the N F revision work, can never be paid for in dollars and cents, yet it is also true that a monetary token of appreciation is always acceptable and so far as I know is never declined Such tokens will be especially effective in stimulating renewed interest in N F revision, if these preceding recommendations be adopted It is therefore recommended that honoraria be paid to the members of the National Formulary Revision Committee, based to an extent at least, on the amount of work that they have been called upon to do or to supervise and to an extent on the faithfulness with which this work has been done "

The report was received and consideration of the recommendations deferred to the afternoon session on motion Army—Geo D Beal See Item No 126

The meeting then adjourned until 2 30 P M

* * * * *

The afternoon meeting was called to order at 2 40 P M with the same attendance as in the morning session

122 *Committee on Recipe Book* In the absence of Chairman Lascoff who sent a message of regret that he could not be present the following report was read by the secretary

Your chairman begs to submit the following report on the Recipe Book for the year 1934-1935

'The success of the second edition of the Recipe Book seems well assured because of the frequent calls for Recipe Book No 1 When the original printing of 5000 copies had been exhausted in March 1934 the second series Series B, consisting of 500 copies was printed Early in July the publishers reported that they were entirely out of stock and that they had called in all stock from depositories which had also been used We are receiving inquiries daily as to when the new Recipe Book will be completed We expect that it will be ready by January 1, 1936 if not sooner In the meantime your chairman has deemed it advisable to have another series Series C printed, consisting of 125 copies in order to care for the present demand We are also accepting advance orders for the second edition

'Great strides in the progress of the second edition have been made since the work of revision was begun in 1932-1933 The first two years were concentrated on the collecting of new formulas This past year the suggestions and efforts of the Committee and your Chairman with the assistance of Mrs Kassner have been centered on correcting the typographical errors in the first edition, deleting superfluous conflicting or duplicated material experimenting with the new formulas that were submitted to be sure that they were workable, transposing proprietary names to their chemical equivalents

'It is no exaggeration to state that to day the pharmacist purchases at least 75% of his U S P and N F galenicals from manufacturers The former cannot purchase from the manufacturer however the galenicals of deleted formulas from old editions These must be prepared by the pharmacist For this purpose the Recipe Book supplies the formula he needs

Deletions—In the new Recipe Book we shall drop any preparations which will be included in the N F VI Your chairman is checking very carefully to be sure that there is no duplication The most valuable formulas deleted from old U S P s and N F 's will remain In

this way, one book of reference in the prescription pharmacy takes the place of several old editions

"Hospital Formulas"—Physicians frequently keep in their minds formulas used in their own particular hospitals and prescribe such formulas. In Recipe Book No. 1, the Pharmaceutical Formulas are in Part I and the Hospital Formulas are in Part II. In the new Recipe Book, we have included the Pharmaceutical and Hospital Formulas in one part. All of the formulas are arranged in alphabetical order under English titles. Preparations of one kind are grouped together. The Hospital Formulas are designated as such.

'Bulletins'—After my last report of 1933-1934, additional bulletins were mailed. Up to the present writing, thirty-four bulletins have been mailed. These new bulletins, proposed in total 352 new formulas, in addition to 21 new veterinary formulas. The 352 new formulas consist of

Pharmaceutical Formulas (including Hospital)	Diagnostic Reagent Formulas
Cosmetic Formulas	Dental Formulas
Flavoring Extracts (Vehicles)	Photographic Formulas
Technical Formulas	Veterinary Formulas

"In addition to the foregoing, we also had bulletins on 'Treatments and Antidotes,' 'Table of Solubilities,' 'Latin Abbreviations' and 'Doses.' A new section was written on Sterilization, in accordance with the latest data obtainable.

"The following is a condensed report of the bulletins that were mailed since the last meeting

'Early in November 1934, the following bulletins were mailed

Bulletin No. 20—Treatments and Antidotes for Poisoning

Bulletin No. 21—Table of Solubilities

Bulletin No. 22—Four Questions Pertaining to the Two Previous Bulletins

"The mailing of all Bulletins, brings forth a great many suggestions from the members. However, it would take too much time and space to enumerate all the various comments. We will, therefore, endeavor to present a summary of the results in each case.

"Some members felt that 'Emergency Treatment' or 'First Aid Treatment of Cases of Poisoning' would be a better title for Bulletin No. 20. Some suggestions were made on additional poisons and their treatment, such as mineral acids, carbolic acid, cresol, lysol, illuminating gas, etc. The 'Treatment and Antidotes for Poisoning' will appear in Recipe Book No. 2.

'Eleven members favored accepting 'Table of Solubilities,' while E. N. Gathercoal, among others, felt that the Table should be reasonably 'complete' before inclusion. This Table will not appear in the new Edition of the Book. 'Latin Abbreviations' will not be included in the new Book.

"Bulletin No. 23, also sent out in November 1934, consisted of 128 N. F. V. Deletions (b). The Committee members favored the inclusion of only a few of the deleted N. F. Formulas. L. D. Havenhill felt that the Recipe Book should not include remedies which have gradually passed out of use, unless the preparations are used regularly and there is a demand for them.

'Bulletin No. 24 was sent out at the same time. In this bulletin were three formulas suggested by L. D. Havenhill which were accepted by the members.

Bulletin No. 25 consisted of 13 new formulas, suggested by W. L. Scoville. With one or two objections, the Committee voted to include all these new formulas.

Bulletin No. 26 presented one new formula and also inquired as to the advisability of including all the formulas for Whitfield's Ointment. We have since been advised that this formula will appear in N. F. VI.

Bulletin No. 27 consisted of 5 new formulas suggested by S. L. Hilton. All were accepted with the exception of Ephedrine Solution of Water and Compound Solution of Ephedrine (in oil), which will appear in N. F. VI.

'Bulletin No. 28—Three new pharmaceutical formulas. All were unanimously accepted.

"Bulletin No. 29—This bulletin included a list of 'Average Doses of Unofficial Drugs,' which was unanimously accepted.

'Bulletin No. 30—This bulletin consisted of the 'Report of the Conference of Part of Recipe Book Revision Committee, held February 25, 1935.' Your chairman feels that it is proper to include this report herewith.

REPORT OF CONFERENCE OF PART OF RECIPE BOOK REVISION COMMITTEE HELD FEBRUARY 25,
1935

Present J L Lascoff, *Chairman*, H V Arny, E F Cook, R P Fischelis, E N Gathercoal, E F Kelly, C P Wimmer and Mrs E W Kassner

The following recommendations were made

1 All pharmaceutical and hospital formulas should be arranged in one section entitled 'Pharmaceutical Formulas including Hospital Formulas,' with a statement to the effect that formulas in Part II of R B No 1 are contained therein

All formulas should be arranged in alphabetical order under English titles All preparations of one kind being grouped together and hospital formulas being designated as such

2 (1) Formulas having titles the same as, or very similar to some N F VI preparations Of these 31 should be deleted as being too similar to N F formulas 12 should remain in the Recipe Book under new names giving the former name as a synonym and 11 should remain as their titles were not sufficiently like those of N F VI to cause any trouble

(2) Formulas having so-called 'therapeutic' titles, referring to some disease or condition or titles attributing certain properties to the preparation

A list of all these should be sent to E F Kelly who would ascertain whether or not such titles would be considered objectionable If it became necessary, titles should be changed

(3) Insecticides E F Kelly should be asked to take up this manner with the proper authorities in order to ascertain the requirements of Federal and State laws

3 General monographs at heads of sections *e g* Ampuls, Emulsions, etc

In case of Ampuls some general principles (quoted from N F VI) should be laid down and page references should be made to N F VI for details regarding sterilization etc That in the case of Emulsions and Elixirs information should be given, but in the case of Tablets be deleted E F Cook undertook to supply the text from U S P XI regarding Emulsions

4 Type Process for Tinctures, etc These should be quoted in full at the beginning of the section

5 Sterilization That in the case of ampuls, etc, page reference should be made to N F VI For Gray Oil page 82 the words 'prepare aseptically' should be inserted

6 Doses Missing That a list of these should be sent to E N Gathercoal who would get them filled in

7 Galenicals listed as ingredients in R B Formulas, but now deleted from U S P and N F That these should be included in the Recipe Book and when occurring as ingredients should be designated "R B"

8 That all drugs, chemicals and preparations named in formulas if official under these names in the U S P or N F are intended to be according to U S P or N F specifications This covers cases of certain substances being either crystalline or anhydrous, strengths of certain solutions, etc

9 Trade marked names That preparations containing ingredients having trade marked names should be deleted E F Kelly was asked to ascertain whether or not certain substances were trade marked That in the case of Photographic Formulas, formulas containing such ingredients should be left as they are

10 (1) Surgical Dressings That this section should be deleted

(2) Dental Formulas That these should await action from the American Dental Association

(3) Laboratory Reagents That this section with 15 new formulas and with all formulas appearing in N F VI deleted, was all right

(4) Veterinary Formulas E N Gathercoal undertook to send these to an authority for revision

(5) Photographic Formulas That L A Becker should be asked to revise this section

(6) Cosmetic Formulas C P Wimmer undertook to revise this section E F Kelly undertook to ascertain, after the former's revision, whether any ingredients could be considered objectionable

(7) Flavoring Agents That the latest circular on standards be obtained and the section revised from this

(5) Technical and Miscellaneous Formulas That no special revision of these was needed

It was suggested that Dr. Pantus and Dr. Eggleston be approached with a view to obtaining information from them for a new section on *Vehicles*

11 (1) New Formulas That these should be included if voted for by a majority the second time

(2) Whitfield's Ointments That the present formula should be omitted and that the formula 25 (6), should be included under the title of "Modified Whitfield's Ointment" or "Whitfield's Ointment with Thymol"

(3) Poisons Table That this should be accepted for inclusion after being referred to a toxicologist Dr. I. Schels undertook to hand the material over to some suitable individual

(4) N. F. Deletions That bearing in mind the 3 previous votes of the committee and the vote of the retail pharmacists, Chairman Lascoff should compile a list of 30 of these for inclusion in R. B. No. 2 and that they should be submitted to the committee as a bulletin

12 Table of Doses That trade marked items should remain on this list That the doses should be carefully checked (1) from Gutman's book (2) by E. F. Kelly setting some one to write to manufacturers asking them to check up on their own items That the avenue of entrance into the body should be stated

13 Table of Solubilities That this should not be included

Additional Formulas for Inclusion by Chairman Lascoff That formulas for—

White Lotion Magma (experimented) OK

White Lotion Ointment (experimented) OK

Whitfield's Solution (experimented) OK

Mercuric Salicylate, Sterile Suspension of Nose Drops of the ordinary and emulsion type should be included in the new edition

Preparations for the Hair That all formulas containing mercury, arsenic or lead salts as ingredients should be deleted

All the recommendations made in the foregoing report have been taken care of

"Bulletin No. 31, mailed May 1935 contained 57 miscellaneous pharmaceutical formulas These were generally accepted

' Bulletin No. 32 mailed June 1935, contained new cosmetic and photographic formulas It also had comments from the Council on Dental Therapeutics of the American Dental Association

Bulletin No. 33 contained corrected formulas vehicles such as flavoring and coloring agents

' Bulletin No. 34 contained four formulas for Ampuls All of the bulletins were generally accepted by the members

In order to clear up some of the questionable formulas of previous bulletins, and to clarify the voting possibilities, the series of 'F' Bulletins was issued for a final vote There were 12 of such bulletins Each of the first three contained sixteen miscellaneous formulas

Bulletin 4F—List of Treatments and Antidotes

' Bulletin 5F—Diagnostic Reagents

' Bulletin 6F—N. F. V. deletions

Bulletin 7F—Dental Formulas

Bulletin 8F—Dental formulas

' Bulletin 9F—Pharmaceutical Formulas (eight) and a question

' Bulletin 10F—Pharmaceutical Formulas

Bulletin 11F—13 Hospital formulas

Bulletin 12F—List of U. S. P. deletions not included in the N. F. VI and admitted to the Recipe Book No. 2 and a list of 30 formulas chosen from the 290 formulas deleted from N. F. VI

"Several members suggested the inclusion of the entire list of these deletions, others suggested discarding the entire list It was finally decided to accept 30 of these formulas and they will be included

The following is a condensed report on the 'F' Bulletins

'On November 30, 1934, Bulletin 1F was mailed, consisting of 16 formulas selected from

previous Bulletins No 1 and No 2, on which there had been some hesitancy about including The final voting showed a majority favoring inclusion of all the formulas submitted, with the exception of the 'Palatable Castor Oil' formula in Bulletin No 2

On December 15, 1934, Bulletins 2F and 3F (16 formulas each) were mailed These were continuations of Bulletin 1F with final votes desired for additional doubtful formulas They were generally accepted with a few suggestions on directions and title changes

'On January 10 1935, Bulletin 4F, consisting of Poisons and Antidotes, and Bulletin 5F Laboratory Reagents, were mailed The majority of the members favored the inclusion of Bulletin 4F Bulletin 5F was favorably voted upon E F Cook made the suggestions that E N Gathercoal be consulted on this Bulletin as he felt that the N F VI would include a great many of these reagents

Bulletin 6F consisted of the list of N F Deletions

On January 18 1935 Bulletins 7F, 8F and 9F were mailed The first two, containing the Dental Formulas were generally accepted, with some changes in directions Bulletin 9F again presented the problem of Whitfield's Ointment, which it was later learned, would be included in N F VI This bulletin also contained the 'Seborrheal Dermatitis' formula, and the title 'Compound Naphthalan Ointment' was suggested However inasmuch as Naphthalan is a proprietary name, it was deemed advisable not to include this formula

'On February 7, 1935 Bulletin 10F consisting of 12 miscellaneous pharmaceutical formulas, and Bulletin 11F, consisting of 13 Hospital and Cosmetic Formulas, were mailed Bulletin 10F included a preference in the two formulas of Surgeon's Lubricating Jelly and the Stain for Acid Proofing Laboratory Desks This Bulletin received a majority of votes for the newer formula (Bulletin 27-2) and a majority vote for the old formula of the Stain as it now appears in Recipe Book No 1 In Bulletin 11F, most of the committee preferred the Ephedrine Menthol Spray with the liquid Petrolatum, although Dr Hilton expects to see a similar formula in N F VI Messrs Thum, Glover, Havenhill and Gray suggest mixing the cottonseed oil with the petrolatum The other formulas were accepted

On February 14 1935, Bulletin 6F was mailed, asking the members which of the N F Deletions they voted to include in Recipe Book No 2 This bulletin was the result of a letter listing the N F Deletions which was mailed to prominent pharmacists in various important cities of the United States They were asked to check their lists for the items for which there was a demand in their prescription department Bulletin 6F showed on a separate list the result of these letters Although a few of the members wished to include all of the N F V deletions, in order to have a positive source of information, a number of the members voted for the inclusion of only a few of the formulas C P Wimmer remarked that the vote of the retail pharmacist should be taken as conclusive as to what is useful in the list of deletions Later, the members approved the action taken at the February meeting with reference to the list of U S P and N F deletions to be included in Recipe Book No 2

'In March 1935, Bulletin 12F was mailed, consisting of a list of the U S P deletions not included in the N F VI and admitted to the Recipe Book No 2 and a list of 30 formulas chosen from the 290 formulas deleted from N F VI which were finally accepted

'Out of the 248 original formulas submitted in the years 1932-33-34-35, it was voted to adopt 142 formulas for inclusion in Recipe Book No 2 The others were not adopted either because they already were in Recipe Book No 1 or they would appear in N F VI

Revision—In conclusion, may your chairman state that the following has been accomplished in the matter of Revision

- '1 Pharmaceutical and Hospital Formulas combined into one Part of the Book
- 2 Revised list of First Aid Kits—reference—Johnson and Johnson, Bauer and Black
- 3 Photographic Section—new formulas submitted by Mr Becker

'4 Methods of Sterilization—as submitted by John C Krantz Jr (assisted by Dr Perry) This seems to have enough of an authoritative source

'5 Sections on Vehicles—These were suggested by your chairman to Dr Eggleston who published them in his *Essentials of Prescription Writing* We are using this information through the courtesy of W B Saunders & Co, publishers

- '6 Treatments and Antidotes for Poisons—revised and taken care of by R P Fischels

' 7 Titles—the revision of objectionable titles with the able assistance of Dr Dunbar, of the Food and Drug Administration

"8 Dental Formulas—with corrections and suggestions of the American Dental Association

' 9 Veterinary Formulas—with the aid of Dr Bergman, chairman of the American Veterinary Medical Association

' 10 N F Deletions—of which 30 were finally selected "

In addition to the above, all parts of the Book have been carefully revised and corrected where necessary

It is with deep regret that I mention here the death of Dr F B Kilmer. He was one of our very earnest workers, faithfully replying to every bulletin mailed to him. He submitted many new formulas, and offered many valuable comments and suggestions, not only for Recipe Book No 1, but also for Recipe Book No 2. The Committee has sustained a great loss by his death.

Your chairman wishes to take this opportunity to express his personal thanks and appreciation for the untiring and responsive efforts of those members of his Committee who have served well.

There were several criticisms received from one or two members of the Committee who claimed that the Recipe Book should contain pharmaceutical formulas only and nothing else. It was our intention to have this book be one of ready reference for the pharmacist. Your chairman receives innumerable requests for formulas of all kinds, and the Recipe Book has been an invaluable aid to him in complying with these requests.

Mrs Kassner and Dr Gathercoal were very helpful to the Committee and I wish to thank them sincerely for their cooperation.

E F Kelly and E G Eberle have been very kind in offering their services, sending out the bulletins direct from their office, after Mrs Kassner left for Europe. My heartfelt appreciation goes to them.

It is the personal opinion of your chairman that when this Book is completed, it will be one of the best reference books on Pharmaceutical formulas, which we have to day.

On motion of Army—Christensen, the report was received and the chairman was requested to supply galley proofs of R B II to the members of the Council. See Item No 126.

123 Publications. President Fischelis suggested the advisability of carefully considering the entire list of publications of the ASSOCIATION and referred to the relation of the Reference Library and Historical Museum of the American Institute of Pharmacy to these publications, which is closer in the case of the Library.

It is important to decide what services the Library is to offer. It should be a source through a condensed index, of information as to where literature is available rather than an attempt to duplicate all of such literature. Among many other possible services, the Library might furnish collections of books and pamphlets for the use of research and other workers.

President Fischelis expressed the belief that some one should supervise the publications—a Director of Publicity—and that the editorial and business management should be separate.

It is possible to make the present JOURNAL serviceable to pharmacists generally without interfering with its value as a scientific publication. Reference was made to the publications of other associations and to the need on our part for a popular type publication to be issued more generally than the JOURNAL.

President Fischelis recommended that a decision as to the policy to be followed, be reached promptly.

A general discussion followed the result of which was an agreement of opinion that the JOURNAL should be continued with such changes as may be found advisable and that steps should be taken promptly to establish a popular publication which will be furnished to pharmacists as widely as possible.

The secretary submitted information as to the cost of such a publication and suggestions as to its title and form.

It was understood that the president would discuss this question in his address in order that it might be brought directly to the attention of the ASSOCIATION and to the consideration of the House of Delegates.

The meeting then adjourned until 8 00 P M

* * * * *

The evening meeting was called to order at 8 20 P M with the same attendance as in the afternoon session

124 *The A P H A—N A R D Joint Committee* President Fischelis and Secretary Kelly reported verbally for the A P H A representatives of which Dr R L Swam is the third member

Reference was made to the report submitted to the meeting of the Executive Committee of the Council on January 4 1935

Since that meeting, only one meeting of the Joint Committee had been held, in Washington, D C, on March 12, 1935 at which three delegates from the Conference of Pharmaceutical Association Secretaries had been invited to confer with the Joint Committee Unfortunately, President McCullough and Secretary Harring of the Conference were unable to attend Secretary Wilson of Georgia, the third delegate, and Secretary Hayman of West Virginia represented the Conference

At this meeting, the question of a joint membership fee was given further consideration and also the possibility of a popular publication to be issued jointly by the AMERICAN PHARMACEUTICAL ASSOCIATION and National Association of Retail Druggists to the members of the state associations No action was taken on either question

The attention of the Council was called to the agreements reached by the Joint Committee with respect to Pharmacy Week, U S P and N F Publicity, and First Aid Week as previously reported

The report was accepted and the Committee continued on motion of Army—Adams

125 *Committee on Standard Program* Chairman Hilton submitted a verbal report on the changes made in the program for this meeting

126 *Report of Committee on National Formulary* It was moved by Geo D Beal, seconded by J H Beal and carried that the recommendations in the report be segregated and considered seriatim

After a general discussion and on motion of Geo D Beal—Army, the appointment of a special Committee on N F and R B Policies was authorized to consist of three members of the Council and, as ex-officio members, the chairmen, respectively, of the Committee on N F, of the Committee on R B and of the Committee of Revision of the U S P, to consider Recommendation No 1 and to report to the Council at the next annual meeting

On motion of Army—Adams, Recommendation No 2 was referred to the Committee on N F and R B Policies for consideration and recommendation

With respect to Recommendation No 3, the Council approved the issuance of supplements to the N F VI, as required, each supplement to be approved by the Council before issuance, on motion DuMez—Geo D Beal

With respect to Recommendations Nos 4 and 5, it was decided to continue the salary of the secretary until January 1 1936 and that the Committee on Finance be requested to prepare a budget for N F revision including the services of a secretary to the chairman and of research workers, on motion Geo D Beal—Fischelis

On motion Fischelis—Army, Recommendation No 6 was referred to the Committee on N F, and R B Policies and on motion of Adams—Geo D Beal, Recommendation No 7 was referred to the Committee on Finance for consideration and recommendation

127 *Commission on Proprietary Medicines* The following report was read by Chairman Beal

When the Commission on Proprietary Medicines was created, the specific task assigned to it was the preparation of a statement of the general principles to which package medicines advertised directly to the public should be expected to conform

After a period of study such a statement of general principles was agreed upon and submitted to the Council in 1915, and upon approval by the Council, was published in the JOURNAL OF THE ASSOCIATION

With the rendering of this report the specific purpose for which the Commission was created was completed, but the Commission has been continued from year to year without any clearly defined purpose or duties

Some years ago the Commission submitted to the Council the question whether it should undertake the study of the package remedies of the market, with the view of determining the extent to which they severally did or did not comply with the above code of general principles

After some discussion, the Council did not see fit to authorize such a study for the following reasons

That such an investigation would involve an expensive set-up and a continuous expenditure which the Council at that time was not prepared to authorize

It was felt that although the ASSOCIATION recognized that there is a place in pharmacy for package medicines when honestly exploited, it could not consistently with its past traditions authorize the publication of an approved list of such medicines, since such an approval would undoubtedly be used for advertising purposes

That the publication of a list of preparations of which it disapproved would very likely involve the ASSOCIATION in expensive and annoying litigation

Proposed New Federal Food and Drugs Act—For nearly two years past there has been pending in the United States Congress the Copeland Bill, re writing and extending the existing Federal Food and Drug Laws, and making important changes in the status of foods and drugs in interstate commerce

Numerous hearings on the Bill have been held before the senate Committee on Interstate Commerce, and the first crudely drawn measure has been extensively modified, most of the modifications having been made by the friends and authors of the bill As modified the Bill has received the approval of the Senate and is now being considered in the House of Representatives Present indications are that either with or without further modification in minor particulars, the measure will become a law within the near future

The existing Federal Act, known as the Food and Drugs Act of June 30, 1906, was principally a labeling law, applying mainly to the labels on foods and drugs, and by inference, to the literature accompanying the packages of such articles In general the Federal Act has been efficiently administered, and to such an extent that grossly or wilfully misbranded foods and drugs have been largely driven from the markets But while fairly efficient in controlling false statements accompanying packages of drugs, the law did not reach other forms of advertising, in consequence of which lack of control the advertising in newspapers and through radio announcements of certain package remedies have far exceeded the limits of decency and truthfulness The existing federal law is also lacking in that it does not apply to cosmetic preparations, which have become such a large factor in modern drug merchandising

The new law when it reaches the statute books, will not only apply to cosmetic preparations as well as to foods and drugs, but will also bring within its scope public advertisements of every kind, including radio announcements, which are made for the purpose of advancing the sale of such articles

While perhaps no law is ever completely effective in restraining the evils at which it is aimed the provisions of the pending Copeland Bill justify the belief that it will eliminate at least the major abuses which have hitherto so frequently prevailed in the advertising of certain classes of package remedies

Scientific Section of Proprietary Association—Recent drug trade publications have contained announcements of a reorganization of the Scientific Section of the Proprietary Association, and the Minutes of the 53rd Annual Meeting of that Association presents a verbatim report of the proceedings of the reorganized Section

From these Proceedings it appears that among the activities proposed for the Section is the careful study of the medicinal agents found in package medicines and the elimination of those which may give rise to injurious results especially when used otherwise than under direct control of an attending physician Among the agents condemned in the report and which it is stated should never be used as ingredients in package remedies are dinitro phenol and cinchophen, a decision with which many of the members of the A. P. H. A. will agree

Another proposed objective is the investigation of attacks upon package remedies, and when such attacks are found to be justified by the facts, to provide for the correction of such faults, or when such attacks are found to be unjust, to prepare and publish the material for their repudiation

If these projects are consistently carried out, the results cannot fail to advance the welfare of the legitimate package medicine industry

The report was received on motion of Adams—Army

Dr. Beal personally recommended that the Commission, on which he did not expect to

continue to serve, be reorganized, that the members be elected at one time to serve for a fixed period, and that the Commission be given definite instructions as to its work After discussion, it was decided to consider the recommendation at a later meeting of the Council

128 Reduction in the Nominees for the Presidency Consideration was given to the recommendation of Former-President Swain in his address at the 1934 meeting that the number of nominees be reduced from three to two The recommendation was continued for further study on motion of Beal—Army

129 Honorarium to the Editor of R B I The secretary reported that Motion No 29 as submitted in Council Letter No 15, page 51 and as referred to in Council Letter No 16, page 57, had failed as lacking a majority

130 A Ph A Monographs Chairman DuMez of the Committee on Publications reported on the possibilities of publishing the Monograph on Aconite recently completed The Committee was requested to further investigate the publication and distribution of the monograph and to report to the Council, on motion of Army—Geo D Beal

131 Certificates of Appreciation to the Members of the Committee on Pharmacy Exhibit at the Century of Progress and to Miss Esther Barney and Mr Thaddeus Niemec The secretary reported on the arrangements for the preparation and presentation of these certificates and the action of the secretary was approved on motion Army—Geo D Beal

132 Nomination of Honorary President, Secretary and Treasurer of the Association Dr D M R Culbreth was nominated to the House of Delegates for election as Honorary President for 1935-1936 on motion of Army—Kelly, E F Kelly, as Secretary on motion Fischelis—Eberle, and C W Holton as Treasurer on motion of Army—Geo D Beal

133 Election of Honorary Member Upon the recommendation of Dr Edward Kremers Dr C A Rojahn of Germany, was elected an Honorary Member of the ASSOCIATION on motion of DuMez—Army

134 Election to Membership On motion of Kelly—Army, the following applicants were elected members

No 265, Frank Nicholas Bono, 725 Columbia, Houston, Texas, No 266, Will T Bradley, 179 Longwood Ave, Boston, Mass, No 267, Louis Milner, 4400 Chestnut St, Philadelphia, Penna, No 268, Columbus Claud Harris, 1019 McGowen Ave, Houston, Texas, No 269 Elmer Baxter Williams, 1101 Main St, Boise, Idaho, No 270, Edward H Divine, 301 No Central Park Ave, Chicago Ill, No 271, Peter Henry Brady, 825 Sprague Ave, Spokane Wash, No 272, Timothy Sylvester Shea, 390 Main St, Worcester, Mass, No 273 R C Shultz, Worland, Wyoming

135 Annual Report of the Council to the House of Delegates The president, the chairman of the Council and the secretary were authorized to prepare the report for presentation to the House of Delegates on motion of Army—Eberle

The meeting then adjourned

* * * * *

The Third Meeting of the Council was held in the Hotel Multnomah on Thursday, August 8, 1935 with the following members present Hilton, Fischelis, Army, Christensen, Adams, J H Beal, Geo D Beal, Eberle, DuMez and Kelly President-Elect Costello also attended

The minutes of the Second Meeting were read and approved on motion Adams—Army, with the correction of the suggested name "Popular Journal" to "Proposed Publication"

136 Committee on Research Chairman Army read the following report

Your committee transacted its business during the year by means of four bulletins On Monday morning August 5th the sub-committee on research projects, held a meeting with four of its five members present On Wednesday afternoon, August 7th, a meeting of the entire committee was called at which time the recommendations of the sub committee were adopted by unanimous vote

The three-year project on drug extraction conducted 1932-1935 by Dr Husa and his associates of the University of Florida speaks for itself At this (Portland) meeting Dr Husa is presenting to the Scientific Section, four papers on the subject Nine papers in all have been submitted since 1932 on this important problem

The great success of the Husa project convinced your committee that a similar comprehen-

sive piece of research should be planned for the coming few years Our discussion of this topic led to the following committee recommendations

(1) That the research begun in October 1935 should be on the subject of tests and assays of (a) N F ampul solutions, (b) N F tablets

(2) That the grant be for a period of one year, with the likelihood of renewal for a second or even a third year

(3) That the present sub committee of five (on research projects) be continued and that it be estimated with details of supervision of the proposed project

(4) That an auxiliary committee of three scientists in manufacturing concerns be formed to furnish technical advice as required

(5) Your committee feels that the proposed \$1000 00 grant is scarcely adequate to cover the type of work desired We therefore request the Council to authorize a grant of \$1500 00 from the A P H A Research Fund

(6) Your committee has not as yet decided upon the person (and laboratory) where the proposed work will be performed We request the Council to permit the Research Committee (or its sub committee on research projects) to continue the negotiations as to the recipient of the grant, our committee to make the nomination, subject to confirmation by the Council

The report was received and the recommendations approved on motion of Beal—Army subject to the approval of the Committee on Finance with respect to the appropriation and with the understanding that the research project will be conducted under the immediate supervision of Chairman Gathercoal

137 American Council on Pharmaceutical Education The secretary read the following report from the representatives of the A P H A of which H A B Dunning and D F Jones are the other members

The American Council on Pharmaceutical Education takes pleasure in reporting to you that progress has been made, even though it cannot present, at this time, tangible evidence of this accomplishment The success of any undertaking of the kind entrusted to the Council depends to a very considerable extent on the degree to which troublesome obstacles have been removed, and the care which has been taken in laying the foundation for the beginning of organized work Our case is no exception to the rule

At the meeting held in Washington, D C, on May 7, 1934, the Council decided that it would proceed immediately with the studies which it will be necessary to make The Council was moved to make the above decision primarily for the reason that it was evident that many of the members of the associations represented were becoming impatient with what they believed to be unnecessary delay in starting the work of making standards However, after your chairman and secretary had consulted with our advisor from the American Council on Education and a sizeable number of individuals of the three organizations represented on the Council, it was decided to wait just a little longer in order to give time for the removal of certain obstacles which it was believed would, if allowed to stand, work out to our disadvantage in the end As a result of developments over the past few months, these obstacles no longer stand in our way and the Council, at the meeting held here on August 3, 1935, decided that the work of formulating standards be proceeded with, without further delay

It may, therefore be expected that the first assignment of work will be sent out shortly after the schools and colleges open in September It is the intention to push the work along as rapidly as possible from now on, and it can be expected that the next report will be one of tangible progress

During the past year, two of the associations represented on the Council have made their contributions of \$200 00 each, to the working fund, making a total of \$400 00 received None of this has been spent to date, but is being held on deposit in Baltimore

President Fischelis suggested that in sending out tentative standards, the Council on Pharmaceutical Education should express its opinion on them

The report was received on motion of Army—Beal

138 Committee on N F and R B Policies The chairman announced the appointment of Geo D Beal, H V Army and E F Kelly as members of the Committee on which Chairman Gathercoal, Chairman Lascoff and Chairman Cook will serve as advisory members

The appointments were approved on motion of Army—Beal

Chairman Geo D Beal stated that the members had met with Chairman Gathercoal and Cook, and submitted the following report

August 8, 1935

To the Council of the American Pharmaceutical Association

Gentlemen 1 Your Committee on N F and R B Policy wishes to give further consideration to the proposal of increasing or decreasing the number of members of the Committee on N F Revision and establishing a rotation of election, and to that end will correspond during the year and perhaps report by Council letter

2 We recommend that the statement of general principles of N F Revision be formally approved at this time

3 We recommend that the following statement be adopted by the Council and appended to the General Notices in N F VI

"In conformity with the policy on scope of the National Formulary, and in recognition of the priority of the United States Pharmacopœia as a standard within the United States notice is hereby given that should the Committee of Revision of the United States Pharmacopœia, Eleventh Decennial Revision, approve for admission and establish standards, by supplements, for items already included in the N F VI, the Pharmacopœial standards shall supercede those of the National Formulary when official notice by publication has been made of that action "

On motion of Geo D Beal—DuMez the report was received and approved

139 *Addition to the 1935 Budget* The recommendation of the Committee on Horticultural Nomenclature that an appropriation of \$20 00 be made for the expenses of the Committee was approved and the appropriation was added to the budget for 1935, on motion of Beal—Army

140 *Committee on National Pharmacy Week* The recommendation of the Committee that its appropriation be increased as submitted in its report to the House of Delegates and referred to the Council, was, after discussion, referred to the Committee on Finance for study and recommendation on motion of Adams—Geo D Beal

141 *Pharmacists' Society of the District of Columbia* A letter from President Norelli of the Society was read requesting some form of affiliation with the ASSOCIATION After an extended discussion of the question and on motion of Beal—Geo D Beal, the secretary was authorized to reply to the communication

On motion of Adams—Army, it was directed that the letter be brought to the attention of the Committee on Resolutions

142 *The Proposed Publication* The issuance of the publication was discussed at length, attention being given to the expense involved, the policy with respect to advertising its relation to the membership of the ASSOCIATION the editorial policy and its contents

On motion Geo D Beal—Christensen the question of the proposed publication was referred to the Committee on Publications for the purpose of submitting a report on policy and budget as promptly as possible, and that consideration of the final report be had at a meeting of the Council to be held in December

143 *Suitable Emblem for the Association* Dr Geo D Beal submitted the following communication

During the making of plans for the interior decoration of the new building of the Mellon Institute of Industrial Research in Pittsburgh, Pa, thought was given to the incorporation in the floor of the entrance foyer of a series of brass patera symbolic of the professions that have advanced through research, and that have been instrumental, through their work of advancing the course of industrial research in the United States Anyone conversant with the subject naturally includes the AMERICAN PHARMACEUTICAL ASSOCIATION among the learned societies that typify such research

While the A PH A has a form of badge or button, and likewise an official seal, neither of these is symbolic of the profession and science of Pharmacy Our policy on such patera is not yet definitely established, and we still have in mind the reproduction of our button However, this only emphasizes the need for an ASSOCIATION emblem that is truly symbolic

There is included herewith a rubbing of a symbol used by Eli Lilly & Co on the cover of the souvenir book describing the recent dedication of their new research laboratory Such an emblem is an illustration of the type that might be used by the A PH A

' It is moved by Geo D Beal that a committee of the Council (new) be appointed to consider the question of a suitable emblem for the AMERICAN PHARMACEUTICAL ASSOCIATION, and to report to the Council upon the propriety of an emblem, together with suggestions regarding suitable designs to be adopted by the Council and the ASSOCIATION "

As a member of this committee I would like to propose the name of Dr W A Hamor, Assistant Director of Mellon Institute, a member of the A P H A and an authority on such matters I am sure that Dr Hamor would gladly give of his time to such an undertaking

After discussion and on motion of Geo D Beal—Christensen, the chairman was authorized to appoint a special committee to consider the matter and to report to the Council

The meeting then adjourned subject to the call of the chairman

* * * * *

The Fourth Meeting of the Council was held on the Multnomah Hotel on Friday evening, August 9 1935, after the Final General Session, with the following members present Hilton, Fischelis Arny, Adams, Christensen, Swain, DuMez, Eberle and Kelly

The minutes of the Thrd Session were read After a discussion, the chairman ruled that the words "if the final report can be completed in the meantime" under Item 142 be omitted The amended minutes were approved on motion DuMez—Fischelis

144 *Section on Practical Pharmacy and Dispensing* The request of the Section for an appropriation of \$75 00 for the continued collection of information pertaining to professional pharmacy was referred to the Committee on Finance, on motion of Adams—Swain

145 *Committees on Library and on Museum* The secretary reported that nominations had been received from only two members of the Council (see Council Letter No 13, pages 329 and 330 and Council Letter No 16, page 511) After discussion, it was decided on motion of Arny—Adams, that these nominations be made a matter of business in the first Council Letter of 1935—1936

There being no further business, the meeting was adjourned sine die

E F KELLY, *Secretary*

THE COUNCIL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, 1935-1936

Office of the Secretary 2215 Constitution Ave , Washington, D C

LETTER NO 1

August 9, 1935

To the Members of the Council

The reorganization and First Meeting of the Council 1935-1936 was held in the Multnomah Hotel Portland, Oregon, on Friday, August 9, 1935, beginning at 10 15 P M

1 The roll was called and the following were present Hilton, Arny, Christensen, Adams, Fischelis, Swain, Costello Delgado, Hayman Cook and Kelly

2 *Election of Chairman* S L Hilton was elected Chairman of the Council for 1935-1936 on motion of Arny, seconded by Adams and carried

3 *Election of Vice Chairman* H C Christensen was elected Vice Chairman of the Council for 1935-1936, on motion of Swain seconded by Arny, and carried

4 *Election of Editor of the Journal* E G Eberle was elected Editor of the JOURNAL for 1935-1936, on motion of Adams, seconded by Hayman and carried

5 *Election of Editor of the Year Book* A G DuMez was elected Editor of the YEAR BOOK for 1935-1936 on motion of Swain seconded by Hayman and carried

6 *Membership of the Council* The membership and officers of the Council for 1935-1936 are as follows

ELECTED MEMBERS

H V Arny, 115 W 68th St , New York, N Y (Term expires 1936)

H C Christensen, 130 N Wells St , Chicago, Ill (Term Expires 1936)

W D Adams, Forney, Texas (Term expires 1936)

H A B Dunning Charles & Chase Sts Baltimore, Md (Term expires 1937)

S L Hilton, 1033 22nd St N W Washington D C (Term expires 1937)

W Bruce Philip, Munsey Bldg , Washington D C (Term expires 1937)
 J H Beal Fort Walton, Fla (Term expires 1938)
 R L Swain, 2411 N Charles St , Baltimore, Md (Term expires 1938)
 C H LaWall, 214 S 12th St , Philadelphia, Pa (Term expires 1938)

EX OFFICIO MEMBERS

P H Costello Cooperstown N Dak
 Frank A Delgado, Department of Commerce, Washington D C
 J Lester Hayman 325 Ash St Morgantown, W Va
 R P Fischelis, 28 West State St Trenton, N J
 E F Kelly, 2215 Constitution Ave , Washington D C
 C W Holton, Box 81, Essex Fells N J
 Roy B Cook, 1559 Lee St , Charleston, W Va
 E G Eberle, 2215 Constitution Ave , Washington, D C
 A G DuMez Lombard & Greene Sts , Baltimore, Md

OFFICERS OF THE COUNCIL

S L Hilton, *Chairman*
 H C Christensen, *Vice-Chairman*
 E F Kelly, *Secretary*

7 *Finance Committee* Chairman Hilton appointed W Bruce Philip, *Chairman* C H LaWall and C W Holton as members of the Committee on Finance and these appointments were confirmed on motion of Army, seconded by Delgado and carried

8 *Committee on Property and Funds* The personnel of this Committee as provided for in the Council By-Laws is as follows P H Costello C W Holton, S L Hilton, W Bruce Philip and E F Kelly

9 *Committee on Publications* Chairman Hilton appointed H V Arny C H LaWall and Walter D Adams as members of the Committee, the other members being E G Eberle, E F Kelly, A G DuMez and C W Holton, as provided in the By-Laws These appointments were confirmed on motion of Arny, seconded by Delgado Chairman Hilton appointed A G DuMez as *Chairman* of the Committee on Publications

10 *Committee on Standard Program* The chairman appointed S L Hilton, T J Bradley and E F Kelly as members of the Committee on Standard Program

11 *Advisory Committee of the Council* It was moved by Swain that the chairman be authorized to appoint an Advisory Committee consisting of seven members to be held subject to the call of the chairman or secretary, to confer on matters not considered of sufficient importance to warrant a meeting of the Council and to appoint the members subject to confirmation by the Council The motion was seconded by Christensen and carried

12 *Committee on Pharmaceutical Research* On motion of Arny, seconded by Swain and carried W L Scoville and John C Krantz Jr were elected members of this Committee to serve until 1940

13 *Commission of Proprietary Medicines* On motion of Fischelis—Arny, the Commission was discontinued

14 *Committee on Proprietary Medicines* On motion Fischelis—Arny, it was decided to elect a committee of seven members to take the place of the Commission on Proprietary Medicines, and to serve for one year J H Beal R P Fischelis, R L Swain F A Delgado W B Day, Roy B Cook and A L I Winne were nominated and on motion Arny—Hayman, the nominations were closed and the secretary was authorized to cast the ballot of the Council for their election The secretary cast the ballot and the chairman declared the nominees elected

15 *Committee on Recipe Book* After a general discussion, it was moved by Arny that the Committee on Recipe Book as listed by chairman Lascoff, be continued for one year The motion was seconded by Adams and carried

16 *Appointment of Standing and Special Committees and Delegates of the Association*

Committees

Committee on the Study of Pharmacy—Same as at present *Committee on Cosmetics*—Same as at present *Committee on Local Branches*—Same as at present *Board of Canvassers*—Gustav Bachman, Charles V Netz and Charles H Rodgers, all of Minneapolis, Minn *Committee on Legislation*—*Chairman*, E F Kelly, Washington, D C , R P Fischelis, Trenton, N J , S L Hilton, Washington, D C , R L Swain, Baltimore, Md , and W Bruce Philip, Washington, D C *Committee on U S Pharmacopœia*—Same as at present except that Arthur F Schlichting, St Louis, Mo (1945) replaces Theodore F Hagenow *Committee on Pharmaceutical Syllabus*—E R Serles reappointed for term ending 1942 *Committee on Pharmacy Week*—Same as at present *Committee on Horticultural Nomenclature*—Same as at present *Committee on Physiological Testing*—Same as at present *Committee on Weights and Measures*—*Chairman*, M N Ford, Columbus, Ohio, R P Fischelis, Trenton, N J , W Mac Childs, Eldorado, Kans , A C Taylor, Washington, D C , Roy D Baker, Denver, Colo , the *Chairman* of the Section on Practical Pharmacy and Dispensing, and the *Chairman* of the Committee on Prescription Tolerances *Committee on William Procter Jr Memorial Fund*—Same as at present *Committee on International Pharmaceutical Nomenclature*—Same as at present *Committee on Press Relations*—Same as at present except that R W Rodman becomes *Chairman* *Committee on Prerequisite Legislation*—Same as at present *Committee on Endowment Fund*—Same as at present *Committee on Maintenance*—Same as at present *Committee on Pharmacy Corps*—Same except E E Duncan Oklahoma City, Okla , replaces F L McCartney *International Pharmaceutical Federation*—Same as at present *Committee on Prescription Tolerances*—Same except M J Andrews, Baltimore Md , replaces Walter F Meads *Committee on Council on Pharmaceutical Practice*—Same except that P H Costello, Cooperstown, N Dak , replaces R P Fischelis *Committee to Draft Model Act Restricting Distribution of Drugs and Medicines to Pharmacists*—Same except that H C Christensen, Chicago, Ill , replaces F E Mortensen *Committee on Professional Relations*—Same as at present

On motion Adams—Delgado, the appointments, as submitted, were approved

The meeting then adjourned

E F KELLY, *Secretary*

ASSOCIATIONS

Information has come that there probably will be no meeting of the Nevada Association this year

At the meeting in Portland, Oregon, rebates and allowances, not open to all retailers, were condemned by resolution of the Oregon Pharmaceutical Association Another resolution enlisted the cooperation of druggists in the state in fighting cut-rate stores It has been suggested that the idea of holding a tri state meeting will be repeated next year

Don F Allen, of Corvallis Ore , was elected president of the Oregon Association and Charles J Ajax of Seattle, was reelected president of the Washington State Pharmaceutical Association Idaho druggists did not hold a reelection

James L O'Neill, who has headed the new NRA for the past two months has resigned

from administration duties to return to his old position as acting vice president of the Guaranty Trust Company in New York City

Howard C Newton, who joined the staff of Creighton University School of Pharmacy in 1914, and who has served as dean of the School during those years, is leaving the School and the middle west to join the faculty of the Massachusetts College of Pharmacy at Boston

J Leon Lascoff completed his 25th year on the New York Board of Pharmacy and has been re appointed a member

Roy A Perry, president of the Oregon Pharmaceutical Association, advocates the movement of "Back to Pharmacy," and advancing the standards of Professional Pharmacy

H W Youngken was elected Grand Regent of the Kappa Psi in Portland, succeeding Grand Regent Mickelsen whose term expires in 1936 Dr Youngken will be installed at the convention in Dallas

COMMITTEE REPORTS

REPORT OF THE COMMITTEE ON RESOLUTIONS *

Recommendations 1 to 17, inclusive, were submitted by President Fischelis at the conclusion of his Presidential Address

The months intervening since the 1934 convention of the AMERICAN PHARMACEUTICAL ASSOCIATION have been very important not only in the life of the nation itself, but in the affairs of this ASSOCIATION. Pharmacy has been confronted with problems of great complexity and importance, many of which at times seemed to threaten the existence of our calling as a profession. In the face of such circumstances, intelligent aggressive leadership was required, and it should be a matter of gratification to the members of this ASSOCIATION that President Fischelis approached and discharged his duties in a frank and courageous manner.

Recommendation No 1

It is recommended that it shall be the policy of the AMERICAN PHARMACEUTICAL ASSOCIATION to require its full-time officers to confine their pharmaceutical activities to the affairs of the ASSOCIATION. This is not to be interpreted as an abridgment of the privilege to take part in related affairs in the capacity of advisor, committeeman or delegate. It is, however, to be interpreted as abridging the privilege of serving in a secretarial or managerial capacity to any other organization or group or to act as the spokesman or representative of any other organization or group within the sphere of pharmaceutical activity unless permission to do so is specifically granted by the Council.

The Committee is sympathetic with the principle of this recommendation in the President's Address but feels that the purpose can be fully effectuated by referring it to the Council for further study and for whatever action it deems to be in the best interest of the ASSOCIATION.

By vote of the House of Delegates the President's recommendation was substituted for the recommendation of the Committee on Resolutions.

Recommendation No 3

It is recommended that it shall be the policy of the AMERICAN PHARMACEUTICAL ASSOCIATION to work actively toward a unification of pharmacal forces within the United States and that the immediate steps to be taken in this direction shall be the fostering of an intimate contact with the State Pharmaceutical Associations and with the National Association of Retail Druggists to the end that membership in State Pharmaceutical Associations shall eventually carry with it a personal affiliation of every State Association member with the A. P. H. A. and the N. A. R. D.—Approved.

Recommendation No 4

It is recommended that it shall be the policy of the AMERICAN PHARMACEUTICAL ASSOCIATION to assume active responsibility for the general direction of pharmaceutical affairs in the United States. This is not to be interpreted as an effort to duplicate the activities of any organization now functioning in a specific field such as education, licensure, manufacturing, wholesaling or retailing. It is, however, to be interpreted as an offer of cooperation from the representatives of the profession at large with respect to the formulation of policies affecting pharmacy as a whole and as an expression of the intent to assume leadership in those matters which are national in their scope and which affect the relations of pharmacists to other professions, the relations of pharmacists to each other and the relations of pharmacists to the public.—Approved.

Recommendation No 6

It is recommended that that office of Librarian and Curator of the Museum be created as soon as possible as a full-time office.—Approved.

Recommendation No 7

It is recommended that the contents of the JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION be confined to scientific and professional papers of permanent value or significance.

* Portland meeting of AMERICAN PHARMACEUTICAL ASSOCIATION

to the monthly abstracts of pharmaceutical literature and to editorials dealing with scientific and professional matters. It is further recommended that as soon as this change can be brought about, the material of general interest now appearing in the JOURNAL together with helpful papers and articles on professional and economic subjects be issued in the form of a new monthly publication directed particularly to the retail pharmacists of the United States. It is further recommended that this publication carry no advertising.—Approved

Recommendation No 8

It is recommended that the new JOURNAL referred to in the preceding recommendation be mailed to the members of all State Pharmaceutical Associations upon payment of a small per capita tax by the respective state Associations and that it be issued with the cooperation of the N A R D if the plans for unification and coordination of the activities of State Associations and the two national associations now under discussion are consummated.—Approved

Recommendation No 9

It is recommended that the cooperation of the A P H A be extended to Boards of Pharmacy in their efforts to establish adequate standards for the practical training of pharmacists, especially in cases where departures from established customs are contemplated and that the results of any survey or study which the ASSOCIATION may make in connection with the formulation of standards for practical experience be made available to the Boards.

The Committee on Resolutions is fully in accord with the principles and objective of this resolution, but the Committee feels that it deals more particularly with the work of the National Association of Boards of Pharmacy and the American Council on Pharmaceutical Education, therefore as chairman of the Committee, I am instructed to move that this recommendation be sent to the Council of the AMERICAN PHARMACEUTICAL ASSOCIATION and the secretary of the N A B P and the secretary of the American Council on Pharmaceutical Education, and to the Council on Pharmaceutical Practice (added on recommendation of President Fischels), for their consideration.—Approved

Recommendation No 10

It is recommended that the dangers of the distribution of drugs and medicines without the supervision of pharmacists be called to the attention of the American Medical Association and Medical Societies of various states with the request that they join the A P H A in an aggressive effort to persuade drug manufacturers to limit distribution of their drug products to registered pharmacists.—Approved

Recommendation No 11

It is recommended that the Council on Pharmaceutical Practice give consideration to certification of specialists in the field of hospital pharmacy, manufacturing pharmacy and prescription pharmacy, by the establishment of boards of experts for such certification.—Approved

Recommendation No 12

It is recommended that the committee on study of pharmacy be instructed to explore the possibilities of extension courses for practicing pharmacists to the end that formal lectures and demonstrations in connection with newer materia medica may be arranged at suitable points and that such instruction be confined to fundamental scientific progress in the field rather than to commercial preparations.—Approved

Recommendations Nos 2, 5 and 13

(2) It is recommended that the secretary of the ASSOCIATION be also designated as general manager and that this title shall carry with it executive supervision of and responsibility for the activities of the ASSOCIATION in the headquarters building.

(5) It is recommended that the president elect be made an ex officio member of the Council immediately following his election and that the procedure at the annual convention be so arranged as to give the president-elect an opportunity to submit recommendations in time for approval at the meeting at which he takes office.

(13) It is recommended that the By-Laws be amended to reduce membership of the Council

to six elected members and three ex-officio members, namely the President, the President-Elect, and the Chairman of the House of Delegates. The six elected members should be distributed geographically in accordance with the concentration of membership.

The Recommendations 2, 5 and 13 in the President's Address are not approved but the Committee on Resolutions wishes to present the following resolution dealing with them.

Resolved, that while it is quite clear that Recommendations 2, 5 and 13 in the President's Address have been carefully considered by the President, and also by the members of the Committee on Resolutions it is the opinion of the Committee that the recommendations herein referred to raise important questions which suggest the advisability of a general study of the By-Laws of the ASSOCIATION. To make them effective will, in the opinion of the Committee require amendments to the By-Laws and perhaps the charter of the ASSOCIATION. For these reasons it is recommended that the incoming president appoint a committee of five (5) to study the constitution and By Laws of the ASSOCIATION and to report to the next annual meeting on changes which it deems necessary to make in the constitution and By-Laws and charter of the ASSOCIATION to place the ASSOCIATION in a position to function most effectively in the light of the new duties which it will be called upon to undertake and in the light also of the widened responsibilities of the ASSOCIATION.

Be it further resolved, that the committee appointed pursuant to the above resolution endeavor to complete its task in time to have its findings and recommendations submitted by publication to the membership sufficiently far in advance of the 1936 meeting to enable the membership to be apprised of the changes proposed —Approved

Recommendation No 14

It is recommended that the Council be authorized to take such steps as may be necessary to obtain the best legal opinion on the status of the National Formulary as a legal standard under the Food and Drugs Act and that such changes as may be required in the manner of selecting the Revision Committee in order to obtain Congressional authorization for the revision and publication of the National Formulary, be inaugurated as soon as possible. It is further recommended that the U S P Revision Convention be urged to take similar steps with respect to the U S P.

The Committee did not take any action on this recommendation in the President's Address as it deals with matters more properly within the province of the Council and we therefore recommend that it be referred to the Council for further consideration —Approved

Recommendation No 15

It is recommended that the Committee on Proprietary Medicines be requested to study the possibilities of organizing an informational service to the profession with regard to the Composition Standards, Classification and ethical status of proprietary medicines and report its recommendations to the Council for action at an early date —Approved

Recommendation No 16

It is recommended that the Committee on Cosmetics be requested to give immediate attention to the possibility of organizing a Council on Cosmetic Preparations with functions similar to the Council on Pharmacy and Chemistry of the A M A and the Council on Dental Therapeutics of the A D A so that necessary information on the composition and claims made for cosmetics may become available to pharmacists and proper standards be devised for the protection of the public in the commerce in these Commodities —Approved

Recommendation No 17

It is recommended that the Council give immediate attention to the possibility of making available from the permanent funds accumulated interest or other sources a sufficient sum of money to launch some of the activities to which the ASSOCIATION is committed. In launching these activities preference should be given to the ones which appear to promise the most immediate return of the financial outlay required in their inauguration. Activities which seem to require immediate attention are revision of the publication program, membership campaigns, Council on Pharmaceutical Practice —Approved

Resolution of the New York Branch

WHEREAS the AMERICAN PHARMACEUTICAL ASSOCIATION by virtue of its constituency should be the major representative body of American Pharmacy, and

WHEREAS such a position is dependent in part upon the AMERICAN PHARMACEUTICAL ASSOCIATION having a greater membership among those engaged in the various phases of pharmacy in the United States, and

WHEREAS the Local Branches of the AMERICAN PHARMACEUTICAL ASSOCIATION are the logical points of contact between the individual member and the parent organization, and

WHEREAS more extensive activity fostered by financial support of the Local Branches may be a possible factor in increasing membership in the AMERICAN PHARMACEUTICAL ASSOCIATION—

Be it resolved, that the AMERICAN PHARMACEUTICAL ASSOCIATION give consideration to the desirability of having all members of this ASSOCIATION residing in districts wherein duly organized Local Branches are, or may be, established, automatically become members of the local body by virtue of their membership in the AMERICAN PHARMACEUTICAL ASSOCIATION, and

Be it further resolved, that the annual dues of each member of the AMERICAN PHARMACEUTICAL ASSOCIATION include membership in the Local Branch of his district or election, if such a body is at present organized or may later be formed within a radius of fifty (50) miles of his mailing address, and that the AMERICAN PHARMACEUTICAL ASSOCIATION allocate 50¢ (or \$1 00) yearly to said Local Branch for each duly elected member thereof, such sum to be in lieu of the dues now collected by the Local Branches, and

Be it further resolved, that members residing in a district bordering upon an adjacent district may signify their choice of the Local Branch they wish to identify themselves with but in no instance shall such choice be permitted unless they reside within a radius of 50 miles of the Local Branch of their election

This resolution is approved by the Committee but inasmuch as it deals with the finances of the ASSOCIATION under the By-Laws it is referring it to the Council of the ASSOCIATION

Report of the Committee on Local Branches

Resolved, that the AMERICAN PHARMACEUTICAL ASSOCIATION do all that is practical to increase interest in the establishment of Student Branches of the ASSOCIATION in the several colleges of pharmacy of the United States and that it give due consideration to the question of student dues so that the burden upon the student may be reduced to the lowest possible amount

This resolution is formulated upon the report of the Committee on Student Branches and as it does in some respects deal with the finances of the ASSOCIATION under the By-Laws it automatically goes to the Council

Report of the Committee on Weights and Measures

The Committee on Resolutions commends the report of the Committee on Weights and Measures and believes that the suggestions made in the report are constructive and recommends that the report be printed in the JOURNAL so that it may come to the attention of all those interested in improving conditions dealt with in the report and those charged with the duty of enforcing such laws as are involved

Recommendation from the Section on Education and Legislation

Be it resolved that a committee be appointed by the President of the ASSOCIATION to be known as the National Committee on Professional Information Pertaining to Dental Pharmacy Its specific function shall be

First—To study the methods used by the various local, county and state organizations in their efforts to bring before dental men usable information on U S P and N F drugs and preparations

Second—To present to the pharmacists of the nation at our next annual convention a digest of constructive ideas gathered from such a survey and other sources

Third—The Committee is to act as a center for receiving and disseminating information which will increase the pharmacist's opportunities for professional scientific service to the dentist —
Approved

Recommendations from the Section on Historical Pharmacy

Resolved, that a committee of three (3) be authorized to be made in the regular way whose duty it shall be to study courses in History of Pharmacy giving especial attention to the scope, time and content of such courses and to bring a report of its findings to our next annual meeting and

Be it further resolved, that a copy of this resolution be sent to the American Association of Colleges of Pharmacy, American Council on Pharmaceutical Education and the Syllabus Committee —Approved

Resolved that the AMERICAN PHARMACEUTICAL ASSOCIATION by proper means, classify edit and publish the papers which have been presented before the Section on Historical Pharmacy, in an effort to create interest in the subject of the History of Pharmacy and to make more readily available the information contained in the papers which have been presented from time to time

While the Committee on Resolutions is in general accord with the spirit of this resolution, it does not feel that this is the proper time to recommend expenditure of funds on this subject

Establishment of a Fellowship within or under the Auspices of the American Pharmaceutical Association

WHEREAS, the AMERICAN PHARMACEUTICAL ASSOCIATION is an organization of pharmacists, including nearly all leaders in American pharmacy and those who are interested in the scientific accomplishments of our profession

WHEREAS, these professional and scientific workers deserve, in recognition and appreciation of the important services which they actually render and have rendered in the past to humanity and to pharmacy in America to be honored in a certain way as to show the expression of gratitude of the AMERICAN PHARMACEUTICAL ASSOCIATION for the work accomplished either in a professional, scientific or legal aspect,

WHEREAS THIS ASSOCIATION is much concerned with the question herein aroused, *therefore be it*

Resolved that the AMERICAN PHARMACEUTICAL ASSOCIATION establish the grading of Fellow to be granted to all pharmacists who are college graduates and who have distinguished themselves and devoted their lives to improve the conditions of the profession in any of the aspects hereinbefore mentioned,

And that a Committee to work on behalf of the ASSOCIATION be appointed in this Eighty-Third Annual Meeting to establish the rules and regulations by which this Fellowship is to be granted

The Committee is mindful of the good intent behind this resolution but feels that this is not the proper time to discuss a matter of such far-reaching importance We therefore recommend that it be referred to the Council to be considered in connection with whatever plans may come before the Council dealing with the membership of the ASSOCIATION —Approved

American Association for the Advancement of Science

In response to an invitation from the permanent secretary of the American Association for the Advancement of Science, the Committee offers the following resolution

Resolved, that the AMERICAN PHARMACEUTICAL ASSOCIATION appoint two delegates to the Seventh American Scientific Congress to be held in Mexico City from the 8th to the 17th of September of this year and that these delegates be instructed to participate as fully as possible in all the efforts to make the Congress a success —Approved

The following resolution is formulated upon two resolutions one coming from the Indiana Pharmaceutical Association and the other from the Section on Education and Legislation

Resolved that the AMERICAN PHARMACEUTICAL ASSOCIATION create a body or bodies with the necessary working facilities to give the pharmacists in this country up to date information on such pharmaceutical and medical material as new drugs, preparations, formulas standards plans for detaining doctors and dentists, as well as other medical groups and other information which will prove helpful and be instrumental in increasing the cooperation and service of the pharmacist to the allied medical professions This information is to appear periodically throughout each year and some method be devised so that all pharmacists may be privileged to take advantage of such

pharmaceutical service—This resolution is approved and referred to the Council as obviously to make it effective will require some financial outlay

Resolved, that the Committee known as The American Institute of Pharmacy Maintenance Committee be continued and that Dr H A B Dunning of Baltimore be asked to accept the chairmanship of the committee for the ensuing year—Approved

Resolved, that the AMERICAN PHARMACEUTICAL ASSOCIATION restate its belief that the present food and drugs act is too limited in its scope to afford the public the proper protection in the matter of food and drugs and cosmetics and that the ASSOCIATION endorse the bill now before Congress known as S 5 substantially in the form in which it passed the Senate and urge its prompt enactment and its officers are instructed to cooperate as fully as possible with all other agencies having this end in view and that a copy of this resolution be immediately sent to the chairman of the committees having the bill in charge—Approved

Resolved, that the AMERICAN PHARMACEUTICAL ASSOCIATION restates its interest in all efforts to make the medical and dental professions more fully acquainted with the drugs and preparations recognized in the U S P and N F , and instructs its officers to cooperate to the fullest extent possible with national, state and local pharmaceutical organizations endeavoring to carry on this important branch of pharmaceutical activity—Approved

Resolved, that the AMERICAN PHARMACEUTICAL ASSOCIATION in order that there may be built up a sounder economic basis for the retail practice of pharmacy, urges the NRA to compile such statistical information in its possession bearing upon the commercial problems of pharmacy and to make them available as rapidly as possible,

Resolved further, that the NRA be urged to continue the study of commercial problems affecting pharmacy in the various parts of the United States so that accurate information dealing with modern business practices and trends may be available—Approved

Resolved, that the AMERICAN PHARMACEUTICAL ASSOCIATION restate its conviction that the purposes of pharmacy would be further advanced by placing pharmacists on boards of health of the various states, and urges that state pharmaceutical associations be asked to place this objective on their legislative programs—Approved

Resolved, that the AMERICAN PHARMACEUTICAL ASSOCIATION express its profound appreciation of the success met with in Arizona, Iowa, Michigan and New Mexico in enacting prerequisite laws and that its officers be instructed to cooperate with those states that do not have such legislation as fully as may be required to secure the enactment of such laws—Approved

Resolved, that the AMERICAN PHARMACEUTICAL ASSOCIATION urges increased interest on the part of the state pharmaceutical associations in all efforts to secure legislation which will more adequately restrict the distribution of drugs and medicines to registered pharmacists, it being the unshaken belief of the ASSOCIATION that there does exist a direct relation between public health and the avenues of distribution of these essential public health commodities, and that the officers of the ASSOCIATION aid in all efforts to bring this about—Approved

Resolved, that the AMERICAN PHARMACEUTICAL ASSOCIATION extend its congratulations to the pharmaceutical associations of the following states New York, New Jersey, Pennsylvania, Maryland, Illinois, Wisconsin, Iowa, Oregon and Washington, for having secured the enactment of fair trade legislation patterned after the California fair trade act,

Resolved further, that it is the sense of this ASSOCIATION that more certain progress will be made if uniformity is obtained in the matter of contracts and administrative procedures under these laws,

Resolved further, that the ASSOCIATION instructs its officers to cooperate as fully as possible with the N A R D and all state pharmaceutical associations in an effort to have similar legislation enacted in all of the states—Approved

Resolved, that the AMERICAN PHARMACEUTICAL ASSOCIATION express its belief that decided improvement was made in the economic phases of pharmacy under the NRA code and that it regrets that this recovery movement failed to meet constitutional requirements, and

Resolved, that in order that the benefits of NRA may be continued and still further advanced

the ASSOCIATION urges the enactment of federal legislation which will permit the people of the states having fair trade laws to enjoy the maximum benefits of these laws, and

Resolved further, that it instruct its officers to cooperate to the fullest extent possible with the N A R D and other pharmaceutical agencies in their efforts to secure the enactment of such a law by the Federal Congress —Approved

Resolved, that the AMERICAN PHARMACEUTICAL ASSOCIATION desires to express its gratification to the American Association for the Advancement of Science for the creation of Section N-3 Pharmacy and for the opportunity to present a separate program illustrating the contributions of pharmacy to the advancement of science —Approved

Resolved, First, that the Committee on Pharmacy Corps in U S Army be continued and that it be instructed to continue its efforts to effect improvement in the pharmaceutical service in the Army and to obtain therein for pharmacy the recognition and status to which it is entitled by virtue of its traditions and the useful service which it is prepared, by education and training, to render

Second, that the Committee be instructed to cooperate with the Surgeon General in obtaining the passage of legislation which will bring about the substance of recommendation number one

If the objective as stated in the first recommendation cannot be attained by this procedure, we recommend

Third, that the committee be instructed to obtain the desired improvement in pharmaceutical service and its concomitant recognition by direct bill to congress —Approved

Resolved, that the AMERICAN PHARMACEUTICAL ASSOCIATION state its firm conviction that increased attention should be given to professional pharmacy and to making the public more conscious of the public health service rendered by pharmacy, and to this end urges more general observance of National Pharmacy Week and instructs its officers to cooperate fully with state pharmaceutical associations and other pharmaceutical groups in the observance of this occasion —Approved

Resolved, that the Committee on the William Procter Junior Memorial Fund be requested to proceed with the erection of the Procter statue in the foyer of the American Institute of Pharmacy as soon as practicable and that in conjunction with the Council, arrangement be made for its unveiling when completed —Approved

Resolved, that the AMERICAN PHARMACEUTICAL ASSOCIATION express its deep appreciation to the Department of Commerce for the cooperation furnished by the Department through F A Delgado and Arthur A Kimball in the preparation of the manuscript for "The Professional Pharmacy" and in the revision of the manuscript for further publication —Approved

Resolved, that the voting delegates from the State Pharmaceutical Associations be designated as auxiliary members of the Committee on Professional Relations and that the members of this Auxiliary Committee be urged to actively cooperate with the members of the medical, dental, nursing and other professions in the consideration of the economic problems of medical care —Approved

WHEREAS, some proposed methods of providing medical care to the public through Federal, State and private agencies contemplate corporate practice involving elimination or serious interference with the personal and private relations between members of the medical, dental, pharmaceutical and nursing professions and their clientele *be it*

Resolved, that the AMERICAN PHARMACEUTICAL ASSOCIATION expresses the belief that it is essential to good medical care and to the welfare of the public that the personal relation between those engaged in the practice of medicine, dentistry, pharmacy and allied professions, and their clientele be preserved —Approved

Resolved, that the AMERICAN PHARMACEUTICAL ASSOCIATION express its profound thanks to the pharmaceutical associations of Oregon, Washington and Idaho for having held a joint convention in the city of Portland during the week of the AMERICAN PHARMACEUTICAL ASSOCIATION convention and for the splendid hospitality extended by the pharmacists of these three states to the members of the AMERICAN PHARMACEUTICAL ASSOCIATION —Approved

Resolved, that the AMERICAN PHARMACEUTICAL ASSOCIATION hereby extends sincere appreciation to Local Secretary A O Mickelsen, Chairman L G Haack F C Felter, Frank Nau

Frederick Grill, Fred Gene, Earl Gunther, Edgar Stipe and all others who have contributed to the comforts of our delegates, for the most efficient and hospitable handling of accommodations and social events for the 83rd annual meeting

Appreciation is also extended to Mrs Ralph A Watson, Mrs Mickelsen, Mrs Larson, Mrs Dickey and Mrs Murphy for the courteous and enjoyable entertainment extended to the ladies attending the meeting

Appreciation and thanks is extended to the Hotel Multnomah for the favors and courtesies extended the A P H A guests and for the efficient service in preparing convention halls for meetings

The ASSOCIATION further extends appreciation to the *Morning Oregonian*, *Journal* and *News-Telegram* for their full and impartial report of the transactions of the meeting —Approved

	E R SERLES	L L WALTON
	GEORGE C SCHICKS	M N FORD
(Signed)	F E BIBBINS	A L I WINNE
	ROY B COOK	WALTER D ADAMS
	R L SWAIN, <i>Chairman</i>	

RELIEF PRESCRIPTIONS BY STATES

The following schedules are abstracted from the N A R D Journal

Washington follows "Pacific Drug Review Pricing Schedule," less 25%

California prescriptions are recorded in duplicate Prescription pricing schedule is set up from which druggists must give 25% discount Cost of one prescription is limited to \$1 00, two or more \$2 00

New York prescriptions must be verified by phone, and copy signed by patient sent with quadruplicate bill U S P and N F drug required with few exceptions but specialties are not replaceable by official equivalents Prices to be net cost plus 25¢

In Ohio U S P and N F preparations are specified Charges to be net cost plus a 25¢ compounding fee

South Carolina relief prescriptions are filled on requisition orders from a field agent, a copy of which is attached to the requisition and mailed to the relief administration at the county seat

Minnesota restricts to U S P and N F items Charge includes cost plus 20% Medicines and medical supplies are to be furnished by registered pharmacists actually engaged in drug business

In Mississippi no special procedure has been worked out

New Jersey prescriptions are written on special forms Druggists file copies with the county director Once a month a county committee, appointed by the New Jersey Pharmaceutical Association goes over the prescriptions If exorbitant prices are charged, they are corrected

In Kansas, each county has its own method of handling

Rhode Island druggists may fill prescriptions signed by social workers in their town, but in cities where hospitals are supported by the city the prescriptions must be filed by the hospital

In West Virginia prescriptions are to be written on special forms General price range about 15% under normal

In Idaho, U S P and N F items specified The doctors to supply four copies of order The recipient must sign and quantities are limited as well as maximum prices

Indiana has no uniform plan

Massachusetts has no uniform plan

Texas prescriptions are handled on orders from local relief headquarters, copy of prescriptions are attached to bills A fee of 25% is added for expense of bookkeeping

Georgia has no uniform practice

In Wyoming, individual counties handle the practice, usually they are divided equally among drug stores in the county

In Florida, relief medical work is handled by a relief clinic Druggists formerly filled the prescriptions, but now pharmacists are employed by the clinics

In Oregon County nurses take care of relief prescriptions Counties pay bills

Colorado has no general rules

Pennsylvania specifies U S P and N F preparations Prescriptions are to be written on special forms and authorization attached to duplicate bills Prescriptions costing more than 50¢ must have special authority

UNITED STATES PHARMACOPŒIA

ABSTRACT OF PROPOSED CHANGES WITH NEW STANDARDS AND DESCRIPTIONS

ELEVENTH REVISION

Copyright 1935 by the Board of Trustees of the United States Pharmacopœial Convention *
All Rights Reserved

PART II—PROXIMATE ASSAYS

The Pharmacopœial Convention of 1930 recommended that 'abstracts of changes proposed for the U S P XI and new standards and descriptions' be published before final adoption that those who are not members of the Revision Committee may have an opportunity for comment and criticism

In compliance with this recommendation, the following abstracts are submitted The nomenclature and the exact wording to not necessarily represent that to be finally adopted

Comments should be sent to the chairman of the Revision Committee

E FULLERTON COOK,
43rd and Woodland Avenue,
Philadelphia, Pa

The most important changes proposed for the proximate assays of the U S P XI are as follows

1 Instead of using type processes for assays as was done in the U S P X, the detailed assay process will accompany each drug

2 The general statement for proximate assays has been rewritten and will be found below

3 The process for the assay of mydriatic drugs has been changed This change was made necessary by the research work of Dr H G DeKay, who showed that, in the case of hyoscyamus at least volatile amines were present and therefore it was necessary to heat the residues to eliminate them It was proved conclusively that mydriatic alkaloids in the absence of moisture and alkalis can be subjected to the temperature of a water-bath for an hour or more without decomposition The proposed change will be indicated under the *Assay of Hyoscyamus*

4 It is proposed to assay *Nux Vomica* for strychnine content instead of for total alkaloids

5 An assay process is proposed for *Camphorated Tincture of Opium*, a preparation which heretofore has not been officially assayed

6 Minor changes in the assay processes of a number of drugs are indicated on the following pages

The General Directions on Proximate Assays, to appear in the back of the Pharmacopœia, are as follows

GENERAL DIRECTIONS FOR THE ASSAY OF DRUGS

Most alkaloids are practically insoluble in water, but are soluble in certain organic solvents which are immiscible with water, such as chloroform ether, amyl alcohol, benzene, petroleum benzin or mixtures of these The salts of the alkaloids however, are usually soluble in water, but in most cases insoluble in nearly all of the above-mentioned solvents The process of assay by immiscible solvents, which is generally known as the "shaking out" process, is based on this property of alkaloids and their salts and is carried out by treating the drug or a concentrated liquid extract with a solvent immiscible with water, in the presence of an excess of alkali which liberates the alkaloid The free alkaloid is dissolved by the immiscible solvent which is then transferred to a separator and extracted with an excess of acid which has been diluted with distilled water The acid portions are then extracted with an immiscible solvent in the presence of a slight excess of alkali and the immiscible solvent evaporated to obtain the alkaloids

Weighing of Portions for Assay—In the preparation of drugs for assay all portions directed to be weighed should be weighed accurately, but with crude drugs, accuracy to the second decimal point is sufficient Portions of pilular extracts may be weighed on a piece of waxed or parch-

* Permission to reprint for purposes of comment can be had on application to the chairman of the Board of Trustees, James H. Beal, Fort Walton, Fla

mentized paper, the surplus paper cut away, and the extract and adhering paper dropped into a separator, beaker or dish containing the solvent, and the extract dissolved. In transferring weighed portions to a separator, the dish containing the material to be assayed should be thoroughly rinsed and the rinsings added to the separator.

Extraction of the Drug—The drug to be extracted should be ground to a powder of the fineness designated (from a No. 40 to a No. 80 powder) and a representative portion selected for the assay and accurately weighed. The drug must not be coarser than the size directed, although a finer powder may be used. The definition of powders will be given. Care should be taken to avoid the loss of water during the powdering of the drug. If it be impossible to avoid this loss, the drug should be dried at a low temperature before powdering, the loss of water noted and a correction made in the final calculations.

METHODS OF EXTRACTION

A By Maceration—An accurately weighed portion of the ground drug is treated with the specified solvent or mixture of solvents made alkaline with ammonia T S and thoroughly mixed and allowed to macerate for from twelve to twenty-four hours with occasional agitation, or for a shorter period with continuous agitation. At the end of this period, the drug is allowed to settle and then an aliquot portion of the solvent decanted and used for the extraction of alkaloids.

B By Percolation—An accurately weighed quantity of the ground drug is placed in a suitable container and completely saturated with the specified solvent or mixture of solvents and allowed to stand for five minutes. A sufficient quantity of ammonia T S to make the drug alkaline is added and thoroughly mixed with the drug. The moistened drug is transferred to a cylindrical percolator, previously prepared by packing the outlet with purified cotton. A small amount of the solvent may be used to rinse the container and the rinsing added to the percolator. The drug is allowed to macerate for a suitable period of time (from one to twelve hours or over night, depending upon the drug to be assayed), then the drug is firmly packed, a pledget of purified cotton placed above it and percolated slowly until the drug is completely extracted. Complete extraction of the alkaloid is determined by evaporating about 4 cc. of the last percolate to dryness, dissolving the residue in dilute acid and adding a drop of mercuric potassium iodide T S or, when testing for caffeine or colchicine, a drop of iodine T S. There should be no turbidity produced by these reagents. The percolate is then treated for the extraction of the alkaloids.

C By Continuous Extraction—An accurately weighed portion of the ground drug is placed in an extraction thimble and the thimble transferred to a suitable extractor (a Soxhlet extractor of appropriate size is satisfactory). The drug is moistened with the specified solvent and mixed by means of a stirring rod and allowed to stand about five minutes. It is then made alkaline with the specified quantity of ammonia T S and thoroughly mixed. The stirring rod is rinsed with a small portion of the solvent and the drug allowed to macerate for from six to twelve hours or over night. The drug is covered with a pledget of purified cotton and packed in the thimble, a sufficient quantity of solvent is added and the drug extracted for a specified period of time. The solvent remaining in the extraction chamber is transferred to the receiving flask and the liquid extract treated for the extraction of alkaloids.

Extraction of Alkaloids—The volume and strength of the acid to be used is usually left to the discretion of the operator. It is best, however, to keep the total volume as small as possible. For the first extraction, it is advisable to use at least 10 cc. of normal acid or sufficient to render the mixture distinctly acid, for succeeding extractions, it is preferable to use 5 cc. of normal acid and 5 cc. of distilled water. In all assays, the extraction should be continued until 0.5 cc. of the acid washings show only a very faint cloudiness on the addition of a drop of mercuric potassium iodide T S, or, in the case of caffeine and colchicine, on the addition of a drop of iodine T S.

The combined acid solutions containing the alkaloid are shaken thoroughly with the appropriate immiscible solvent and allowed to stand until the mixture has completely separated. The acid solution is then drawn off into a second separator, the immiscible solvent washed with a little distilled water and this wash water added to the acid solution. The acid solution is then made alkaline, in most cases with ammonia T S, and then extracted with several successive portions of the appropriate immiscible solvent. The volume of the latter to be used in each operation is not less than half that of the aqueous solution, and this operation must be repeated

as long as any alkaloid is extracted by the immiscible solvent To determine the completion of extraction, evaporate 1 cc of the last washing and dissolve the residue in a few drops of diluted hydrochloric acid, the resulting solution should show no turbidity on the addition of a drop of mercuric potassium iodide T S, or, in the case of caffeine and colchicine, on the addition of a drop of iodine T S The number of extractions required depends largely on the character of the alkaloid With most alkaloids it is advisable to extract three or four times before testing Phy sostigmine and pilocarpine require about twice as many extractions as other alkaloids

Determination of Alkaloids—An alkaloidal residue to be determined volumetrically should be softened by the addition of about 1 cc of alcohol or ether made neutral to the indicator used in the titration, the required amount of standard acid added, and the mixture gently warmed to insure the complete solution of the alkaloid If preferred, the alkaloidal residue may be dissolved in chloroform, the standard acid added and the chloroform removed by evaporation Before titrating add a sufficient quantity of distilled water to make the volume of the mixture measure about 25 cc When the residue is to be weighed, if the final solvent has been chloroform, the last traces of that solvent should be removed by the addition of a little ether or alcohol made neutral to the indicator used in the titration followed by evaporation Care must be taken to avoid loss by decrepitation, especially when evaporating chloroformic solutions of nux vomica or cinchona alkaloids Decrepitation may usually be prevented by the addition of a little alcohol made neutral to the indicator used in the titration after the solution has been reduced to a volume of 1 or 2 cc, evaporating at a low temperature, and rotating the container during the process

Adsorbent—In assaying fluidextracts, tinctures and other preparations of alkaloidal-bearing drugs, it is often necessary to evaporate these to dryness and, to avoid loss and to aid in the evaporation, they are usually added to some adsorbent material Paper pulp or asbestos fibre should be used for this purpose Such adsorbent material must be acid and alkali washed and then rendered neutral by washing with distilled water and dried before being used

Indicators—Methyl red T S is to be used as the indicator in volumetric estimations The same lot of indicator used in titrating the alkaloids should also be used in evaluating the standard solutions

Apparatus for Proximate Assays—When a container of definite size and shape is recommended in a proximate assay process, it is understood that this is advisory and not obligatory, except when volumetric flasks, measuring burettes or other exact measuring apparatus are specified

Aliquot Parts—When using "aliquot parts," the solvent and the aliquot part should be measured at the same temperature When handling volatile liquids, a lower temperature and a more quickly conducted operation reduces the loss from evaporation

Emulsions—The shaking or rotation of an aqueous solution with an immiscible solvent, in a separator, should ordinarily be continued for about one minute Long or violent agitation should be avoided as emulsions are likely to form Hyoscyamus, belladonna and stramonium leaves sometimes contain saponins which cause troublesome emulsions Should emulsions prove persistent, draw off the emulsified portion and add an excess of either solvent This usually breaks the emulsion and permits a complete separation It is sometimes preferable to break the separated emulsion by the addition of a small amount of anhydrous sodium sulfate If this is done it becomes necessary to wash the residue with additional solvent to completely remove the alkaloids

Emulsification is sometimes prevented by increasing the volume of the aqueous or of the immiscible solvent Chloroform or ether solutions of drugs which contain large proportions of fat may form troublesome emulsions In such cases it is advisable to add sufficient normal sulfuric acid to assure acidity and evaporate the volatile solvent while stirring with a rubber tipped glass rod When the resinous and fatty matter has been agglutinated cool the acid solution and filter it through a small, wetted filter into a separator Redissolve the residue in 15 cc of ether, add 5 cc of tenth normal acid, evaporate the ether as before, with continued stirring, and pour the acid solution through the filter into the separator Repeat the extraction of the fatty residue with dilute acid two or three times and finally wash the filter free from alkaloids

Washing—The stems of separators and funnels and the lips of flasks, separators and graduates from which volatile solvents containing alkaloids, have been drawn or poured, should be carefully washed with some of the solvent to prevent loss and to remove any of the alkaloids left by evaporation These washings should be added to the other extractions

MOISTURE DETERMINATION BY THE TOLUENE DISTILLATION METHOD

The following method has been adopted for the determination of moisture in *Asafetida* and similar drugs

Apparatus—Use a 250- to 500-cc flask of resistance glass, a 20-inch, scaled-in, straight-tube, Liebig condenser and a distilling tube receiver

The condenser and receiving tube must be chemically clean to prevent an undue quantity of water from sticking to them. Clean them with chromic-sulfuric acid solution or similar oxidizing cleaner, rinse with distilled water, then with alcohol and dry in an oven

Determination—Place in the flask an accurately weighed amount of the drug to be tested, which it is estimated will yield from 2 to 4 cc of water. If the drug is likely to cause bumping, add enough dry sand to cover the bottom of the flask. Add sufficient toluene to cover the drug completely, usually about 75 cc, and connect the apparatus. Fill the receiving tube with toluene by pouring it through the top of the condenser. Heat the toluene in the flask until it boils, and distil slowly, about two drops per second, until most of the water has passed over, then increase the rate of distillation to about four drops per second. When the water is apparently all over, wash down the condenser by pouring toluene in at the top, continuing the distillation a short time to ascertain whether any more water will distil and if it does, repeat the washing of the condenser with toluene. If any water remains in the condenser, remove it by brushing it down into the tube receiver with a tube brush attached to a copper wire and saturated with toluene, at the same time washing the condenser with toluene. Allow the receiving tube to stand until of room temperature and if any drops of water still adhere to the sides of the tube they can be forced down by a rubber band wrapped around a copper wire. Finally read the volume of water and calculate to determine the percentage

Assay of *Asafetida*—To yield not less than 50 per cent of alcohol soluble extractive

Place about 2 Gm of *Asafetida*, accurately weighed, in a tared extraction thimble and extract with alcohol in a Soxhlet apparatus or other suitable extraction apparatus for three hours or until completely extracted. Dry the insoluble residue at 100° C for thirty minutes and weigh. Determine the amount of moisture in the drug by the toluene distillation method, calculate the weight of moisture in the *Asafetida* and subtract this weight of moisture from the original weight of the *Asafetida* taken for the assay. The difference between this result and the weight of the residue determined above represents the alcohol-soluble extractive

Assay of *Aloe*—This drug has received a great deal of careful study, both from the chemical assay and from the physiological effect on daphnia. However, no satisfactory method has yet been devised for assaying this drug

Assay of *Aspidium*—Prepare an ethereal extract as directed under *Oleoresin of Aspidium*, using 125 Gm of the drug. Assay as directed under *Oleoresin of Aspidium*. *Aspidium* yields not less than 6.5 per cent of oleoresin and not less than 1.5 per cent of crude filicin

Assay of *Oleoresin of Aspidium*—Warm the *Oleoresin* on a water bath and stir until it is thoroughly mixed. Transfer about 3 Gm of it, accurately weighed, to a 250 cc flask, dissolve it in 40 cc of ether, add 75 cc of a 3 per cent aqueous solution of barium hydroxide, and shake the mixture vigorously for five minutes. Transfer the mixture to a separator, allow the liquids to completely separate, and draw off and filter the barium hydroxide layer. Rinse the 250 cc flask with two 25 cc portions of a 3 per cent aqueous barium hydroxide solution. After each rinsing, transfer the barium hydroxide solution to the separator, shake the mixture for one minute, allow the liquids to separate completely and draw off and filter the barium hydroxide layer. Transfer the combined filtered barium hydroxide solutions to a separator, render distinctly acid to litmus paper by the addition of hydrochloric acid, and extract with three successive portions of 30 cc, 20 cc and 15 cc of ether. Filter the combined ethereal solutions, wash the filter with ether, evaporate and dry the residue to constant weight at 100° C. This residue is calculated as crude filicin and its weight should be not less than 24 per cent of the weight of *Oleoresin* taken for the assay

Assay of *Belladonna Leaves*—Proceed as directed under Assay of *Hyoscyamus*

Assay of Extract of *Belladonna Leaves*—A. *Pilular*—Proceed as directed under Assay of *Pilular Extract of Hyoscyamus*. B. *Powdered*—Proceed as directed under Assay of *Powdered Extract of Hyoscyamus*

Assay of Tincture of Belladonna—Proceed as directed under Assay of Tincture of Hyoscyamus, with slight modifications

Assay of Belladonna Root—Proceed as directed under Assay of Hyoscyamus

Assay of Fluidextract of Belladonna Root—To 10 cc of fluidextract of belladonna root add 10 cc of approximately tenth-normal acid and 10 cc of distilled water and evaporate on a water bath to about 10 cc. Then add 10 cc of distilled water and proceed as directed under Assay of Hyoscyamus, beginning with the words 'filter this mixture'

Assay and Standard of Belladonna Ointment—Ointment of Belladonna yields not less than 0.118 per cent and not more than 0.132 per cent of the alkaloids of belladonna leaves

Assay Accurately weigh about 25 Gm of the well mixed Ointment and transfer it completely to a 250 cc separator having a pledget of purified cotton packed loosely in the stem. Add 100 cc of ether-chloroform mixture (ether, four parts and chloroform, one part) and shake the mixture vigorously until all of the fats have been dissolved. Extract the alkaloids from the mixture with five successive 20-cc portions of 2 per cent sulfuric acid. Draw off each portion of the clear acid solution into a small separator containing 10 cc of ether. Wash each acid extraction successively through this same 10 cc of ether and draw off the acid solutions into another 250-cc separator. Render the combined acidified solutions alkaline with ammonia T S and extract the alkaloids completely by shaking out with successive, 25 cc portions of chloroform, testing for complete extraction as directed under *Proximate Assays*. Allow each portion to settle, and then filter through purified cotton, wetted with chloroform, into a 250 cc beaker, finally washing the stem of the separator and the filter with a little chloroform. Evaporate the chloroform from the combined solutions by warming at a moderate heat on a water-bath until it is reduced to a volume of about 10 cc. Add a measured excess (about 10 cc) of fiftieth normal sulfuric acid, stir the mixture, and continue the evaporation until all of the chloroform has been expelled. Add 20 cc of recently boiled and cooled distilled water and one drop of methyl red T S and titrate the excess of acid with fiftieth normal sodium hydroxide. Each cc of fiftieth-normal sulfuric acid is equivalent to 0.00578 Gm of the alkaloids of belladonna leaves

Assay of Belladonna Plaster—Belladonna Plaster is a mixture of adhesive plaster mass and an extract prepared from belladonna root, spread evenly upon fine cotton cloth or other suitable backing material. The plaster mass yields not less than 0.25 per cent and not more than 0.30 per cent of the alkaloids of belladonna

Each 100 square centimeters of the spread plaster contains at least 2.5 Gm of the belladonna plaster mass

Assay Same as in U S P X except for the following changes. An extra washing of the cloth and beaker, the precipitated rubber is kneaded with a glass rod to force out any chloroform alcohol solution, the cotton pledget is pressed to remove the rest of the solvent, the residue is dissolved in 5 cc of chloroform made neutral to methyl red T S, 10 cc of fiftieth normal acid added and the chloroform evaporated on a water-bath and then the excess of acid titrated with a fiftieth normal alkali

Assay of Benzoinum—

Assay Place about 2 Gm of Benzoin, accurately weighed, in a tared extraction thimble and extract with alcohol containing 0.5 per cent of sodium hydroxide in a Soxhlet apparatus or other suitable extraction apparatus for five hours, or until completely extracted. Dry the insoluble residue at 100° C for thirty minutes and weigh. Determine the amount of moisture in the drug by the toluene distillation method; calculate the weight of moisture in the Benzoin and subtract this weight of moisture from the original weight of the Benzoin taken for the assay. The difference between this result and the weight of the residue determined above represents the alcohol soluble extractive

Assay of Cinchona—Place 5 Gm of Cinchona, in 'fine powder' and 15 cc of 3 per cent hydrochloric acid in a 500 cc flask and heat the mixture on a water bath for one hour. Cool and add 200 cc of ether-chloroform solution (ether 4 volumes chloroform 1 volume) and 10 cc of stronger ammonia T S. Stopper the flask tightly and shake it for one hour in a mechanical shaker. Allow the mixture to stand over night, again shake it for one half hour, and then allow the drug to settle. (If the supernatant liquid is not clear, add a few cc of distilled water, again shake the contents of the flask vigorously and allow the drug to settle.)

Quickly decant 160 cc of the clear, ether-chloroform solution, measured at approximately

the same temperature as the original menstruum and representing 4 Gm of the drug Transfer the solution to a separator, rinse the measuring vessel with a small quantity of the ether chloroform solution and add the rinsings to the separator Completely extract the alkaloids with approximately 5 per cent sulfuric acid and collect the acid solution of the alkaloids in a second separator

Make the acid solution strongly alkaline with ammonia T S and completely extract the alkaloids with chloroform Evaporate or distil the chloroform in a tared beaker or flask and dry the alkaloidal residue to constant weight at 100° C The weight obtained, multiplied by 25, represents the per cent of the alkaloids of cinchona in the drug

Assay of Compound Tincture of Cinchona—Evaporate 50 cc, accurately measured, of Compound Tincture of Cinchona, to about 10 cc at a temperature not exceeding 100° C Add sufficient asbestos fiber or paper pulp to absorb the liquid and continue the evaporation to dryness Transfer the residue to a flask or bottle, add 200 cc, accurately measured and at room temperature, of ether-chloroform mixture (ether 4 volumes, chloroform 1 volume) and sufficient ammonia T S (which may be used to rinse out the adhering portions of the Tincture from the evaporating dish) to render the mixture strongly alkaline Securely stopper the container and shake it mechanically during one hour, or intermittently during two hours and then allow the mixture to stand over night Again shake the mixture intermittently for half an hour, allow it to settle, quickly decant 160 cc (representing 40 cc of the Tincture) of the approximately clear liquid Filter this into a separator and wash the measuring vessel with sufficient of the original menstruum, adding the rinsings to the separator Extract the alkaloids from the clear liquid with acidulated water, using sufficient dilute sulfuric acid to render the contents of the separatory funnel and each extract distinctly acid to litmus paper Pass the acid extracts in succession through a wetted, double filter into a second separator Render the combined liquids distinctly alkaline with stronger ammonia T S and extract with chloroform Pass the chloroformic extracts through a double filter, which is kept saturated with chloroform, into a suitable, tared receptacle Evaporate the chloroform on a water bath, dry the residue to constant weight at 100° C and weigh The weight multiplied by 2.5 represents the weight of alkaloids in 100 cc of the Compound Tincture of Cinchona

Assay of Colchicum Seed—U S P X process is continued with only minor changes in the wording

Assay of Ginger and Fluidextract of Ginger—The standards and assays are as follows

Ginger contains not less than 4.5 per cent of ether-soluble extractive

Assay Place 20 Gm of Ginger, in moderately coarse powder, in an extraction thimble in a Soxhlet or similar extractor Extract with ether for six hours, evaporate the liquid on a water-bath until the odor of ether is no longer perceptible, and place the container in a desiccator for twelve hours or over night and then weigh The weight of the extract should be not less than 0.90 Gm

Only Jamaica Ginger will be recognized in the forthcoming pharmacopœia

Fluidextract of Ginger contains, in each 100 cc, not less than 4.5 Gm of ether-soluble extractive

Assay Place 20 cc of Fluidextract of Ginger in a 200-cc beaker Place this on a water-bath and evaporate the liquid until there is no longer any odor of alcohol Remove it from the bath and add 50 cc of ether Stir the contents of the beaker with a stirring rod to dissolve the soluble resin and decant the ether through a dry, 9-cm filter into a tared 200 cc beaker Repeat the extraction two or three times, using 50-cc portions of ether Finally wash the filter with a small amount of ether and evaporate the combined ethereal extractions on a water-bath until the odor of ether is no longer perceptible Place the container in a desiccator for twelve hours or over night and then weigh The weight of residue shall not be less than 0.90 Gm

Assay of Hyoscyamus—To yield not less than 0.040 per cent of the alkaloids of hyoscyamus by the new assay The U S P X assay gave a larger yield but the substance estimated was not all alkaloidal

As indicated above it was necessary to change the assay process of this drug because of the volatile amines present and this assay process is made the basis for the assay of all mydriatic drugs and their preparations The process is as follows

Place 25 Gm of Hyoscyamus, in fine powder, in an extraction thimble, insert the thimble

in a Soxhlet extractor, moisten the drug with a mixture of 8 cc of stronger ammonia T S, 10 cc of alcohol and 20 cc of ether and mix thoroughly. Macerate the mixture over night then extract it for not less than three hours, on a water bath, using ether as the solvent. The following alternative process may be used. Moisten 25 Gm of *Hyoscyamus* in fine powder, with a mixture of 8 cc of stronger ammonia T S, 20 cc of ether and 10 cc of chloroform in a small percolator, previously prepared by packing the outlet with a pledget of purified cotton. Macerate the mixture over night, pack it in the percolator and extract the drug by slowly percolating with a mixture of 3 parts of ether and 1 part of chloroform. Continue the percolation until the 3 or 4 cc of percolate last passed, when evaporated to dryness and the residue dissolved in dilute sulfuric acid, fails to become turbid when treated with mercuric potassium iodide T S. Evaporate the extractive obtained by either method, to about 15 cc, then add 10 cc of approximately tenth normal sulfuric acid and 10 cc of distilled water and continue the evaporation until the volatile solvents are removed. Filter this mixture, collecting the filtrate in a separator, dissolve the chlorophyll residue in chloroform, add acidulated water, evaporate on a water-bath until the chloroform is removed and filter into the same separator through the filter previously used. Render the mixed filtrates alkaline with ammonia T S and remove the alkaloids by extracting with chloroform, testing for the complete extraction of the alkaloids. Evaporate or distil the chloroform from the combined extractions until reduced to a small volume, then evaporate to dryness on a water-bath and keep at this temperature for fifteen minutes. Dissolve the residue in chloroform, evaporate to dryness on a water-bath and continue the heating for fifteen minutes. Repeat this treatment for the third time. Dissolve the resulting residue in chloroform, add 15 cc of fiftieth-normal sulfuric acid, remove the chloroform by evaporation and titrate the excess acid with fiftieth-normal sodium hydroxide, using methyl red T S as the indicator. Each cc. of fiftieth-normal acid is equivalent to 0.00578 Gm of the alkaloids of *Hyoscyamus*.

Assay of Pilular Extract of Hyoscyamus—To yield not less than 0.135 per cent and not more than 0.175 per cent of the alkaloids of *hyoscyamus*.

Dissolve approximately 5 Gm of *Pilular Extract of Hyoscyamus*, accurately weighed (see Proximate Assays, for method of weighing) in 10 cc of chloroform add 10 cc of approximately tenth-normal sulfuric acid and 10 cc of distilled water and evaporate the mixture on a water-bath until the chloroform is removed. Complete the assay as directed under *Hyoscyamus* beginning with the words "Filter this mixture, collecting the filtrate in a separator." Each cc of fiftieth-normal acid is equivalent to 0.00578 Gm of the alkaloids of *hyoscyamus*.

Assay of Powdered Extract of Hyoscyamus—To yield not less than 0.135 per cent and not more than 0.175 per cent of the alkaloids of *hyoscyamus*.

Dissolve 5 Gm of *Powdered Extract of Hyoscyamus* in 10 cc of chloroform, add 10 cc of approximately tenth-normal sulfuric acid and 10 cc of distilled water and evaporate the mixture on a water-bath, until the chloroform is removed. Complete the assay as directed under *Hyoscyamus*, beginning with the words "Filter this mixture, collecting the filtrate in a separator." Each cc of fiftieth-normal acid is equivalent to 0.00578 Gm of the alkaloids of *hyoscyamus*.

Assay of Tincture of Hyoscyamus—Each 100 cc to yield not less than 0.0034 Gm and not more than 0.0046 Gm of the alkaloid of *hyoscyamus*.

Evaporate approximately 250 cc, accurately measured, of *Tincture of Hyoscyamus* at a temperature not exceeding 80° C, to about 25 cc. Add 10 cc of approximately tenth normal sulfuric acid and 10 cc of distilled water and complete the assay as directed under *Hyoscyamus* beginning with the words "Filter this mixture, collecting the filtrate in a separator."

Each cc of fiftieth-normal acid is equivalent to 0.00578 Gm of alkaloids of *Hyoscyamus*.

Assay of Ipecac—Place 10 Gm of *Ipecac* in fine powder" in a dry, 250-cc flask. Add 100 cc of ether which is free from peroxide stopper the flask shake the mixture thoroughly and allow it to stand for five minutes, then add 10 cc of ammonia T S. Again stopper the flask tightly and shake it for one hour in a mechanical shaker or intermittently during two hours. Allow the mixture to stand over night, again shake it intermittently during one-half hour and then allow the drug to settle. Decant into a separator 50 cc, accurately measured, of the clear, supernatant liquid (representing 5 Gm of drug) and rinse the vessel with a small quantity of ether.

Completely extract the alkaloids from this ethereal solution with approximately normal sulfuric acid, preferably using 15 cc the first time and 10 cc on each succeeding extraction, and

filtering each portion into a second separator Continue the extraction until no reaction can be detected in the sulfuric acid solution when tested as directed in the General Article on Proximate Assays

To the combined acid solutions add about an equal volume of peroxide free ether, render the mixture alkaline by the addition of ammonia T S and extract with successive portions of the ether until no visible reaction takes place when tested as directed above Filter each portion of the ethereal extract into a 200 cc flask or beaker and carefully evaporate the combined ethereal solutions on a steam bath, until nearly but not quite dry Add 5 cc of the peroxide free ether and again evaporate nearly to dryness Add 10 cc of tenth-normal sulfuric acid and heat on a steam-bath to effect complete solution and to remove all of the ether Cool and titrate the excess of acid with tenth-normal sodium hydroxide, using methyl red T S as the indicator Each cc of tenth-normal sulfuric acid is equivalent to 0.0240 Gm of the ether-soluble alkaloids of Ipecac

Assay of Fluidextract of Ipecac—Each 100 cc to yield not less than 1.55 Gm and not more than 1.90 Gm of the ether-soluble alkaloids of ipecac

Transfer 10 cc of Fluidextract of Ipecac, accurately measured, to an evaporating dish containing either absorbent paper or asbestos and dry at a temperature not exceeding 60° C Transfer the absorbent to a flask containing 100 cc of peroxide-free ether, stopper the flask, shake well and allow the mixture to stand for five minutes Then add 10 cc of ammonia T S using a portion of the ammonia T S to rinse traces of the absorbent from the evaporating dish Stopper the flask tightly and shake the mixture during one hour in a mechanical shaker, or occasionally, by hand, during a period of about two hours Allow the mixture to stand over night and again shake it occasionally during a one-hour period Allow the absorbent to settle and decant exactly 50 cc (representing 5 cc of the Fluidextract) of the clear supernatant liquid into a separator Completely extract the alkaloids from the ethereal solution with approximately normal sulfuric acid, filtering each portion into a second separator and test for complete extraction as directed under Proximate Assays Render the combined acid solution alkaline with ammonia T S, extract with successive portions of peroxide-free ether and again test for complete extraction Filter the ethereal extracts into a flask or beaker and evaporate them carefully on a steam-bath, nearly, but not quite, to dryness Add 5 cc of ether and again evaporate nearly to dryness Add 10 cc of tenth-normal sulfuric acid and heat on a steam-bath to effect complete solution and to remove all of the ether Cool, and titrate the excess of acid with tenth-normal sodium hydroxide, using methyl red T S as the indicator Each cc of tenth-normal sulfuric acid is equivalent to 0.0240 Gm of the ether-soluble alkaloids of ipecac

Assay of Nux Vomica—To yield not less than 1.15 per cent of strychnine

Place 15 Gm of Nux Vomica, in coarse powder, in a flask or bottle, add 150 cc of a mixture of 3 volumes of ether and 1 volume of chloroform, agitate the mixture and allow it to stand for about two minutes Then add 10 cc of stronger ammonia T S, agitate thoroughly, stopper the container securely and shake frequently, but gently, during one hour Now allow the mixture to stand for twelve hours or over night in a cool place At the expiration of this period, shake the container gently for fifteen minutes, and then allow it to separate Decant 100 cc of the liquid (representing 10 Gm of Nux Vomica), and transfer it to a separator, rinsing the container with a little chloroform and adding the rinsings to the separator Now add about 40 cc of approximately normal sulfuric acid to the separator and shake the mixture gently for five minutes, then allow the liquids to separate and draw off the acid layer into another separator and repeat with successive portions of the acid, until the drug is completely extracted (Test for the complete extraction of the alkaloids)

To the combined acid solutions in the separator, add a small piece of red litmus paper and 50 cc of chloroform, and follow with sufficient ammonia T S to render the aqueous layer alkaline and, after gently shaking, add 2 or 3 cc more of the ammonia T S Now shake the mixture thoroughly but gently for about ten minutes, and allow the liquids to separate Draw off the chloroform into a container and repeat, with additional portions of chloroform, until all of the alkaloid is extracted

Carefully evaporate the combined chloroformic extracts to dryness on a steam bath, dissolve the residue by warming with 15 cc of approximately 3 per cent sulfuric acid, cool and then add 3 cc of a mixture of equal parts of nitric acid and a 5 per cent solution of sodium nitrite

in distilled water, stir well and allow to stand for exactly ten minutes at room temperature. At the expiration of this period pour the red solution into a separator containing 50 cc of chloroform, rinse the flask with distilled water and add the rinsings to the separator. Now immediately add sufficient 10 per cent sodium hydroxide solution to make the contents of the separator distinctly alkaline to litmus paper, and then add a few cc more of the hydroxide solution. Shake the mixture gently for ten minutes and allow the liquids to separate. Draw off the chloroformic layer into another separator and repeat the shaking out with additional portions of chloroform until the alkaloids are completely extracted. Add 10 cc of distilled water to the combined chloroformic extract, shake the mixture gently and add a small piece of red litmus paper. The litmus paper should indicate not more than a slight alkalinity. Draw off the chloroform, passing it through a filter paper, moistened with chloroform, into a container. Shake the residual water with 5 cc more of chloroform, separate this chloroform and add it to that previously separated. Wash the filter paper with warm chloroform and add it also to the container. If the water, after shaking with the chloroform, is strongly alkaline draw off the chloroform into another separator and shake it with another 10 cc of distilled water. Now shake out the combined water extract with 5 cc of chloroform and draw off all of the chloroform through a chloroform-moistened filter paper as before.

Evaporate the combined chloroform very carefully on a steam-bath nearly, but not quite, to dryness. Add to the moist residue 6 cc of tenth normal sulfuric acid and follow by 30 cc of distilled water. Heat the mixture on a steam-bath until the alkaloid is dissolved and the odor of chloroform is dissipated. Cool to room temperature and titrate the excess of acid with tenth normal sodium hydroxide using one drop of methyl red T S as the indicator. Each cc of tenth normal sulfuric acid is equivalent to 0.03342 Gm of strychnine.

Assay of Extract of Nux Vomica—To yield not less than 7.0 per cent and not more than 7.75 per cent of strychnine.

Place about 1.5 Gm of Extract of Nux Vomica accurately weighed, in a dish and digest it on a water-bath with about 10 cc of diluted alcohol acidulated with acetic acid until the extract has liquefied. Transfer the solution to a separator containing 25 cc of chloroform and wash the dish with successive small portions of diluted alcohol adding the rinsings to the separator. Dilute the alcoholic liquid with an equal amount of distilled water, render it alkaline with ammonia T S, and completely extract the alkaloids with successive portions of chloroform. Then proceed as directed under the *Assay for Nux Vomica* beginning with the words "Carefully evaporate the combined chloroform extracts." Each cc of tenth normal sulfuric acid is equivalent to 0.03342 Gm of strychnine.

Assay of Tincture of Nux Vomica—Concentrate 100 cc of Tincture of Nux Vomica to about 10 to 20 cc by evaporating it at a temperature not exceeding 60° C. Transfer the concentrated liquid to a separator containing 25 cc of chloroform and rinse all traces of liquid from the dish, using small portions of diluted alcohol and adding the rinsing to the separator. Add a volume of distilled water equal to that of the alcoholic liquid render the solution alkaline with ammonia T S and completely extract the alkaloids by shaking out with successive portions of chloroform. Then proceed as directed under the *Assay for Nux Vomica* beginning with the words "Carefully evaporate the combined chloroform extracts" etc.

The number of cc of tenth normal sulfuric acid consumed, multiplied by 0.03342 indicates in grams the amount of strychnine in 100 cc of the Tincture.

Assay of Opium Granulated Opium and Powdered Opium—This is essentially the U S P X assay process except that the morphine crystals are washed with 'morphinated' water instead of distilled water.

Assay of Tincture of Opium—Essentially the same as the U S P X assay process except as indicated above in the *Assay of Opium*.

Assay of Camphorated Tincture of Opium—This is the first time that an assay process has been included in the U S P for this preparation. The process is as follows:

Each 100 cc to yield not less than 0.035 Gm and not more than 0.045 Gm of anhydrous morphine.

To 100 cc of the Tincture add 2 cc of approximately normal sulfuric acid, evaporate the mixture on a water bath to about 10 cc and transfer the residue to a separator. Wash the evaporating dish with portions of about 10 cc of a mixture of equal volumes of normal sulfuric

acid and distilled water, and add the washings to the separator. If necessary, wash the dish with several cc of a mixture of 85 volumes of chloroform and 15 volumes of alcohol, adding these washings to the liquid in the separator. To this mixture add about 9 Gm of sodium chloride and carefully neutralize to litmus paper by adding stronger ammonia water, and then add several drops in excess. Add 130 cc of a mixture of 85 volumes of chloroform and 15 volumes of alcohol, shake the contents of the separator and then allow the mixture to completely separate.

Transfer the immiscible solvent portion to a second separator and extract the remaining aqueous solution with successive portions of the chloroform alcohol mixture until a negative test for morphine is obtained with sulfuric acid formaldehyde T S. Collect the extractions in the second separator. If more than four extractions are required, increase the quantities and volumes of all subsequent reagents so as to maintain the proportions here prescribed.

Dissolve 25 Gm of sodium hydroxide in 1000 cc of distilled water, saturate the solution with sodium chloride, filter and add 15 cc of this alkaline salt solution to the chloroformic alcohol extract just prepared. Remove the morphine by shaking with several successive portions of alkaline salt solution, collecting the latter. Wash the combined alkaline salt solutions with 10 cc of chloroform and discard the chloroform. Exactly neutralize the alkaline salt solution to litmus paper by adding hydrochloric acid, and finally add a slight excess of acid. Cool the solution to 25° C, shake it with 10 cc of chloroform. Remove the chloroform to another separator and shake it with 5 cc of saturated sodium chloride solution to which a few drops of hydrochloric acid have been added. Discard the chloroform and add the acid salt solution to the combined salt solutions.

Now add stronger ammonia T S to the combined salt solutions until it is neutral to litmus paper and then add a slight excess of the ammonia. Cool the solution to 25° C and immediately extract the alkaloids with successive portions of the chloroform alcohol mixture. Filter each extraction into a container through purified cotton wetted with the chloroform alcohol mixture and, when completely extracted, discard the liquid in the separator.

Evaporate the combined chloroformic solutions on a water-bath to a volume between 1 cc and 15 cc. Add 10 cc of alcohol neutral to methyl red T S to the residue and warm the mixture to dissolve the alkaloids and to remove the last traces of chloroform. Add 1 drop of methyl red T S and then a measured excess of fiftieth normal sulfuric acid. *Guard against the presence of undissolved particles.* Cool and add 15 to 20 cc of recently boiled and cooled distilled water. Titrate the excess of acid with fiftieth normal sodium hydroxide which is sufficiently free from carbonate to insure a sharp end-point with methyl red T S as the indicator. Each cc of fiftieth normal sulfuric acid corresponds to 0.00571 Gm of anhydrous morphine.

Assay of Podophyllum—Considerable study was given to the assay process of podophyllum and the following process is recommended.

To yield not less than 4 per cent of resin of podophyllum.

Place 10 Gm of Podophyllum, in fine powder, in a 125 cc Erlenmeyer flask and add 35 cc of alcohol. Fit a stopper with a glass tube for refluxing (a reflux condenser may be substituted) and heat on a water bath for three hours. Transfer the mixture to a small percolator and percolate slowly with warm alcohol until the percolate measures 95 cc. Cool, add sufficient alcohol to make the volume exactly 100 cc and mix thoroughly.

Transfer 10 cc of this percolate to a separator, and add 10 cc of chloroform and 10 cc of 0.6 per cent hydrochloric acid. Shake the mixture, allow it to separate, draw off the alcohol-chloroform layer into a second separator, and then wash the acid layer three times with successive 15 cc portions, of an alcohol chloroform mixture prepared from one volume alcohol and two volumes of chloroform, adding the washings to the second separator. Add 10 cc of 0.6 per cent hydrochloric acid to the combined extracts and washings, again shake the mixture, allow it to separate and draw off the alcohol chloroform layer into a tared vessel. Wash the acid layer three times with 15 cc portions of the alcohol chloroform mixture, adding the washings to the tared vessel. Evaporate the combined extractions on a water-bath to apparent dryness, add 1 cc of dehydrated alcohol and again evaporate to dryness and then to constant weight at 80° C. The weight of this residue, multiplied by 100, indicates the per cent of resin in the drug.

Assay of Stramonium—To yield not less than 0.30 per cent of the alkaloids of stramonium. Proceed as directed under Assay of Hyoscyamus.

Assay of Extract of Stramonium—To yield not less than 1.10 per cent and not more than 1.30 per cent of alkaloids of stramonium

Pilular Proceed as directed under Assay of Pilular Extract of Hyoscyamus

Powdered Proceed as directed under Assay of Powdered Extract of Hyoscyamus

Assay of Tincture of Stramonium—Each 100 cc. to yield not less than 0.027 Gm. and not more than 0.033 Gm. of alkaloids of stramonium

Proceed as directed under Assay of Tincture of Hyoscyamus

A CORRECTION

An error was made in transcribing the notes on our calomel article, *JOUR A PH A* 24, 97-102 (1935)

On pages 101 and 102 wherever the μ sign is used, it should read 1/1000 inch

Will you please make this correction some time this year so that the correction will appear in the same volume as the article?

(Signed) CHARLES H. LAWALL

CANCER RESEARCH

Report was made at the American Chemical Society meeting in San Francisco, of apparent success in treating cancer by means of lead phosphate administration to a degree producing lead intoxication

BLINDNESS CAUSED BY USE OF DINITROPHENOL

W. G. Campbell, Chief of the Food and Drug Administration, has issued a Bulletin on the above subject. The statement is made that eye cataracts observed in dinitrophenol poisoning develop with rapidity and result in total blindness within a comparatively short time. The symptoms of the poisoning are nausea, stomach and intestine disturbance, high fever, rapid breathing and muscular rigor, followed by death.

Mr. Campbell states that the cases of progressive blindness recently reported in California are the result of medication with dinitrophenol. The statement is also made that dinitrophenol is sold under fanciful names and the statement is made that if the preparation contains the drugs it may not be known to the seller nor to the buyer. Purchaser should be advised regarding the dangers which follow the use of the drug.

BANG'S DISEASE IN CATTLE

Testing to eradicate Bang's Disease in cattle is under way in nearly all states. The work is conducted by the Bureau of Animal Industry

A total of 250 herds showed one or more reactors and retesting is now under way

PHARMACOLOGICAL AND VITAMIN LABORATORY

Dr. Walter G. Campbell, chief of the Food and Drug Administration, has stated that the work of the Pharmacological and Vitamin Laboratory will be expanded. The work will include bioassay and other drug studies, investigation of the toxic effects of fruit spray residues and examination of food and drug vitamin products.

MORPHINE ADDICTION

Drs. O. H. Plant and D. Slaughter, of the State University of Iowa, reported to the American Society for Pharmacology and Experimental Therapeutics that the development of tolerance is one of the tests for judging the morphine substitutes. Dinitrophenol stimulates oxidation, the process by which the body burns food or other fuel to get energy; it increases the burning of morphine in the bodies of dogs that had no tolerance for the latter drug. In morphine tolerant dogs, the general burning of oxidation process was speeded up by dinitrophenol, but judging from the fact that there was no decrease in the amount of morphine excreted, it appears that the burning of morphine itself was not affected by dinitrophenol in tolerant dogs. Consequently the investigators assume that the dog's body handles morphine differently when it has become used to the narcotic.

BRITISH PHYSICIANS VISIT UNITED STATES

Fifty-five British physicians, with members of their families making a group of 110, visited New York, Washington, Chicago, Albuquerque, the Grand Canyon, Los Angeles and San Francisco between August 4th and 14th, on their way to the annual session of the British Medical Association in Melbourne, Australia in September.

EDITORIAL NOTES

PLEASE NOTE

Owing to the large number of Addresses, Council Business and Reports, the Editorial Notes and matter usually following have been omitted. The lateness in receiving some of them and the fact that the September issue of the JOURNAL will soon be completed, these pages will be included in that issue. For Roster of Associations, Boards, etc.—see July JOURNAL.

NOMINEES FOR A PH A OFFICERS, 1936-1937

For *President*, George D. Beal, Pittsburgh, Pa.; John Culley, San Francisco, Calif.; E. Fullerton Cook, Philadelphia, Pa. For *First Vice-President*, W. J. Husa, Gainesville, Fla.; J. Leon Lascoff, New York, N. Y.; H. W. Youngken, Boston, Mass. For *Second Vice-President*, A. O. Mickelsen, Portland, Ore.; E. R. Serles, Brookings, S. D.; James C. Munch, Philadelphia, Pa.

Three will be elected from the following nine nominees for places on the Council: W. D. Adams, Forney, Tex.; F. E. Bibbins, Indianapolis, Ind.; W. Mac Childs, Topeka, Kan.; H. C. Christensen, Chicago, Ill.; C. J. Clayton, Denver, Colo.; C. H. Evans, Warrenton, Ga.; R. P. Fischelis, Trenton, N. J.; Ernest Little, Newark, N. J.; A. L. I. Winne, Richmond, Va.

NATIONAL PHARMACY WEEK

National Pharmacy Week will be held during the week of October 21st, the change of date is made largely in order to give colleges of pharmacy time in which to prepare for the annual event. Honorable mention certificates and prizes will be offered for window displays. The Washington, D. C., Wholesale Drug Exchange has announced a prize of a balance and honorable mention certificates will be offered by the National Association of Retail Drug-gists and the AMERICAN PHARMACEUTICAL ASSOCIATION.

We have had a number of inquiries regarding Pharmacy Week maps from private and public schools and are advised that Secretary E. L. Newcomb of the N. W. D. A. still has a number of these maps; pharmacists should make application from their wholesale druggists.

UNITED STATES CIVIL SERVICE EXAMINATION

The United States Civil Service Commission has announced an open competitive examination for Associate Electrochemist. Applications for the position of associate electrochemist must be on file with the U. S. Civil Service Commission, Washington, D. C., not later than September 16, 1935. At present there is a vacancy in this position in the Bureau of Chemistry and Soils, Department of Agriculture.

The entrance salary is \$3200.00 a year, less a deduction of $3\frac{1}{2}$ per cent toward a retirement annuity.

Applicants must have been graduated with a bachelor's degree from a college or university of recognized standing upon the completion of at least 118 semester hours, of which at least 30 semester hours must have been in chemistry. In addition, they must have had at least three years' experience, acquired since graduation, of a progressive specialized technical character in electrochemical manufacturing plants, preferably in the production of chlorine, chlorates or persulphates. Such experience must have necessitated a thorough knowledge of electrochemistry and must have involved familiarity with and responsibility for plant operation and production costs. The major portion of the experience must have been obtained within the 10 years immediately preceding the date of the close of receipt of applications.

Full information may be obtained from the secretary of the United States Civil Service Board of Examiners at the post-office or custom house in any city which has a post-office of the first or the second class, or from the United States Civil Service Commission, Washington, D. C.

INTERNATIONAL CONGRESS OF PHARMACY

The Twelfth International Congress of Pharmacy was held in Brussels during the week of July 29th. M. Pattou, President of the National Pharmaceutical Society of Belgium, and also the Congress, presided at the meeting and the opening ceremonies were attended by the King and Queen of Belgium. There were also present the French and Bra-

zilian Ambassadors and dignitaries from a number of countries

President Pattou explained the objects of the Conference and spoke of Pharmacy as a profession, possessing equal rank with the other learned professions of the world

Dr J Bruegelmans gave a history of the Conference and referred to the participating countries in the organizations represented and that the reports of the Conference should be printed in the respective publications

A meeting was held for the discussion of the International Pharmacopœias, at which time papers were read by the participants of the Congress among these a report was made by Prof Oscar Van Schoor, secretary of the International Pharmacopœia Commission

Following a discussion it was decided that the League of Nations would be asked to establish a commission for the production of an International Pharmacopœia and that the meetings of the Commission be held in Brussels A general opinion prevailed that the first International Pharmacopœia should be limited to a description of certain reagents and methods of analysis on which the participants are in agreement Discussions were also held and other discussions dealt with army pharmaceutical service

PERSONAL AND NEWS ITEMS

Dr Marshall A Howe was appointed director of the New York Botanical Gardens, succeeding Dr Elmer D Merrill

The Ebert award a gold medal, was presented to Marvin J Andrews, of the faculty at the University of Maryland, for a meritorious scientific research paper—"Determination of the Reasonable Permissible Margin of Error in Dispensing," at the annual convention in Portland, Oregon, of the AMERICAN PHARMACEUTICAL ASSOCIATION

H C Christensen of Chicago, was given a plaque in recognition of his services in handling exhibits at the Chicago World's Fair

The bulletin of W Bruce Philp for August 9th gives available information relative to weighing and measuring, the purpose being to insure accuracy in prescription practice

William A Noyes, *emeritus director* of the laboratories of the University of Illinois, received the Priestley medal highest award of the American Chemical Society at the general session of the meeting of the society, August 19th in San Francisco The subject of his medalist

address was "The Way Forward in Chemistry"

F W Meissner, La Porte, Ind, had his 50th display at the La Porte County Fair His booth on this occasion was decorated in gold trimming

Hon Frank J Kobelak, of the Pennsylvania Legislature, whose fair trade bill was signed by Governor Earle, is a druggist of Pittsburgh

An organization has been formed for the study of problems associated with phenol phthalein, the research activities will be under direction of Dr Bernard Fantus, assisted by a research staff at the University of Illinois

The memorial of the late Dr F B Kilmer will be perpetuated by a Memorial Garden being planned by the Philadelphia College of Pharmacy and Science east of the college building

Frederick G Zinser was born in New York N Y, March 20, 1868 received his primary education in the public schools of New York, N Y, after which he attended Columbia University, from which he graduated with the class of 1888 Subsequently he spent several years in Louvain Gottingen and Heidelberg where, in 1891, he obtained the degree of doctor of philosophy Dr Zinser has been elected president of Sharp & Dohme

John A Gerlach, Baltimore Md, presented a Prescription Balance to the Museum of the American Institute of Pharmacy

We congratulate Mr and Mrs Lyman W Griffin upon the completion of a half century of life together Lyman Griffin started in the drug business in 1874 entering the Massachusetts College of Pharmacy in 1879 and graduating in 1882 He was made a life member of his alma mater, served as its secretary for twenty-five years and is now a vice president of the college After more than sixty years in retail pharmacy he is now actively engaged in the management of The J G Godding store in Boston He has given generously of his time and effort to pharmaceutical organizations he is a member of the AMERICAN PHARMACEUTICAL ASSOCIATION, and for many years has been treasurer of both the Massachusetts State Pharmaceutical Association and the Boston Association of Retail Druggists

Dr Frank Lee Pyman is to receive the Hanbury Medal for 1936

SEVENTH AMERICAN SCIENTIFIC CONGRESS

The Seventh American Scientific Congress will be held in Mexico City Mexico, September

ber 8th to 17th The president of the organization is Pedro C Sanchez Besides the scientific program, interesting entertainment events have been arranged for, our fellow-member G G Colin desires to have publicity given of the meeting

THE AMERICAN RED CROSS

Membership in the Red Cross offers the way to help those who have become victims of natural disasters such as floods, fires, earthquakes, etc Each year the Red Cross answers nearly one hundred such calls for aid There are bureaus of 3700 chapters and 9000 branches located in the states and the service is given from these central points

TRI-STATE PHARMACEUTICAL CONVENTION

The Tri State Convention of Idaho, Washington and Oregon, at the same time and place, with that of the AMERICAN PHARMACEUTICAL ASSOCIATION, was eminently successful The work of F C Felter was given much credit for carrying the program into effect

DRUG LAW REVISION POSTPONED TO 1936

There will be no action on the food and drug bill until Congress reconvenes in January it was declared by Representative Virgil Chapman of Kentucky, *Chairman* of the subcommittee of the House Interstate Commerce Committee which conducted hearings on the measure

OBITUARY

P E HOMMELL

Dr Philemon E Hommell Jersey City, N J, member of the AMERICAN PHARMACEUTICAL ASSOCIATION, one of the founders and first dean of the New Jersey College of Pharmacy Newark died August 21st, aged 72 years He was graduated by the New York College of Pharmacy and the Bellevue College Medical Hospital and maintained a private medical practice in addition to his college post Dr Hommell served for many years as professor of materia medica and toxicology at the New Jersey college and at the time of his death was *dean emeritus* of the institution He was a former president of the New Jersey Pharmaceutical Association and was a delegate to the United States Pharmacopœial Convention, 1900-1920

HENRI GOLAZ

Dr Henri Golaz professor of Galenical Pharmacy, Lausanne University, and chief pharmacist, County Hospital Lausanne, died June 30th, aged 75 years He was educated at Vevay, and on completion of his studies he went into business in Sainte Croix, returning to Vevay after several years to take over the Pharmacie des Crois Couronnes, the oldest pharmacy in the district In 1925 he was awarded the degree of Sc D *honoris causa* by Lausanne University, he was among those who received the members from the different countries on the occasion of the 1924 International Pharmacy Congress held in Lausanne

He was chairman of the Committee for the Unification and Standardization of Preparations of Poisonous Drugs, and member of the Revision Committee of the Swiss Pharmacopœia

DR HERMANN EMDE

Dr Gottfried Wanruk, Koenigsberg, Pr, Besselstrasse 5, Germany, advises that Doctor of Philosophy, Hermann Emde, director of the Pharmaceutic Chemical Institute of the Albertus University, Koenigsberg, Pr Besselstrasse 5, Germany, died in Thun, Switzerland, on a visit for the restoration of his health, following an operation The deceased was Professor of Pharmaceutical and Food Chemistry

ARTHUR DEHON LITTLE

Arthur Dehon Little, aged 71 years, chairman of the board and founder of Arthur D Little, Inc, a *past-president* of the American Chemical Society, and a member of the Advisory Board of Industrial and Engineering Chemistry died suddenly August 1, 1935, at the Rock End Hotel Northeast Harbor, Maine, where he had gone to spend the summer with Mrs Little Upon arrival at the hotel on July 28th, Dr Little seemed completely exhausted as the result of a cold The following day pneumonia developed Dr Little was born in Boston, Mass, on December 15, 1863 He was a member of the class of 1885 of Massachusetts Institute of Technology

(Continued on page 732)

WEST VIRGINIA STATE PHARMACEUTICAL ASSOCIATION

R. L. Swain was among the speakers at the West Virginia Pharmaceutical Association on the present conditions of the druggists and the problems which face them in the future. He explained the Fair Trade Bill as passed by the Maryland Legislature and the steps which have been taken in other states to put the measure into operation.

The following were nominated for officers, election to be held by mail ballot, for 1936-1937: *President*, Rodney A. Barb, Parsons; E. O. Wiseman, Fayetteville; *First Vice-President*, James A. Patterson, Martinsburg; Paul Poundstone, Buckhannon; *Second Vice-President*, J. Edgar Johnson, Charleston; W. S. Coleman, Lewisburg; *Third Vice-President*, Fred A. McFarlin, Clarksburg; Charles E. Tuttle, Parkersburg; *Secretary-Treasurer*, J. Lester Hayman, Morgantown; Roy B. Cook, Charleston; *Member of Council*, J. Charles Hall, Charleston; Fred C. Allen, Marlinton.

The fifth annual veterans' luncheon with an excess of fifty veterans in attendance was a feature of the Convention. Several of the charter members were present.

W. Bruce Philip, secretary of the District of Columbia Pharmaceutical Association, was a feature speaker, stressing the necessity of co-operation and pointing out the value of belonging to the state and national pharmaceutical associations.

The following officers were installed to serve during the year: *President*, Robert R. Pierce, Morgantown; *First Vice-President*, John A. Greear, Huntington; *Second Vice-President*, Jas. A. Patterson, Martinsburg; *Third Vice-President*, H. A. Goodykoontz, Bluefield; *Secretary-Treasurer*, J. Lester Hayman, Morgantown; *Member of Council*, Chas. V. Selby, Clarksburg.

CANADIAN PHARMACEUTICAL ASSOCIATION

The education of the apprentice, dealt with by Professor A. W. Matthews of the School of Pharmacy, University of Alberta, Edmonton, drew a good deal of cross fire and debate at the Canadian Pharmaceutical Association. Out of this it is believed there will be some plan evolved in every province of the Dominion to take the education of the apprentice out of the

hit and miss" class and give it some definite trend.

The newly elected officers of Canadian Pharmaceutical Association are: *Honorary Presidents*, Miss Agnes Short, Saint John N. B., H. S. Tapscott, Brantford, Ont., E. A. Jolly, Regina, Sask., J. H. Best, North Battleford, Sask., J. F. Scott, Cranbrook, B. C., Rod. Dagenais, Montreal, Que., *President*, S. R. Balcom, Halifax, N. S., *Vice-President*, H. M. Corbett, Creemore, Ont.

At a meeting of the Council A. J. Wilkinson was elected *Chairman*, Dr. B. J. Stanbury, *Secretary-Treasurer*, both are reflections. The 1936 meeting of the Canadian Pharmaceutical Association will be held at Saskatoon.

NEW NRA BODY TO SURVEY FAIR TRADE ACTIVITY

Under supervision of Mark Merrell, formerly assistant deputy administrator in charge of the retail drug and other distribution codes for the old NRA, a newly created Loss Limitation unit of the NRA has started a comprehensive study of retail price control and of loss leader merchandising.

Work on the price control study must be completed before next April when the new NRA expires, every effort is to be made to have it business-like and thorough. At present a staff of fourteen persons is engaged in the study, including statistical and legal experts formerly engaged in other NRA work.

THE PATMAN BILL

Shortness of time has stopped any action by the House Judiciary Committee on the Patman bill or some substitute for it. Although hearings were concluded, members of the committee did not have time to act on the complicated problems involved in an attempt to eliminate price discrimination. Chairman Hatton W. Sumners has appointed a subcommittee to study the bill and others of a similar nature and to make a report during the next Congress to the full committee.

PARAGORIC RULING

The Food and Drug Administration has ruled that paregoric labels must bear a warning that it is a dangerous preparation particularly for children.

FAIR TRADE LEGISLATION

Secretary Robert L Swann, of Baltimore, of the Maryland Board of Pharmacy, will head the committee on federal and state fair trade legislation of the National Association of Retail Druggists. The committee will endeavor to assist states in securing passage of fair trade legislation, and will support efforts toward the enactment of a national fair trade law.

In addition to Chairman Swann the committee includes N S Gesoalde, New York, Robert P Fischelis, New Jersey, J B Pilchard, Pennsylvania, Otto A Bjornstad, Iowa, Bernard S Weinshenker, Illinois, John F Huber, Wisconsin, Roy A Perry, Oregon, M P Goodner, Washington, and E F Kelly, Washington, D C.

ILLINOIS

Under a law passed by the Illinois Legislature, druggists, both retail and wholesale, are compelled to grant employees at least twenty-four consecutive hours of rest in addition to the regular period of rest at the close of each working day. Although, generally speaking, the majority of drug stores without the compulsion of law grant employees definite periods of layoff, there are believed to be a small number where, on occasion, employment has been of seven days' duration.

KENTUCKY BOARD

Failing to work out the budget situation which was brought about when Gov Ruby Laffoon vetoed a \$6500.00 appropriation, the Kentucky Board of Pharmacy has indicated that it probably will take its case to court in a friendly suit to determine its financial status.

MARYLAND REPEAL FAILS

Baltimore druggists, who joined with other retailers in an effort to have the gross receipt tax declared unconstitutional, met defeat when the Maryland Court of Appeals sustained the law's constitutionality.

PROCEEDINGS N A B P DISTRICT NO 2, BOARDS AND COLLEGES OF PHARMACY

The proceedings of the N A B P, District No 2, Boards and Colleges of Pharmacy, has been issued in a mimeographed form of 118 pages. The meeting was held March 11-12 1935.

THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY

The following officers for 1935-1936 were elected by the American Association of Colleges of Pharmacy: *President*, Robert C Wilson, Athens, Ga., *Vice President*, H C Washburn, Boulder, Colo., *Secretary-Treasurer*, Zada M Cooper, Iowa City, Iowa, *Chairman of the Executive Committee*, C B Jordan, La Fayette, Ind., *Members of the Executive Committee*, Ernest Little, Newark, N J., Rufus A Lyman, Lincoln, Nebr. *Member of the Syllabus Committee*, H A Langenhan, Seattle, Wash.

Officers of the Teachers Conferences are as follows: *Pharmacy*, *Chairman*, E T Motley, S Car., *Vice Chairman*, Robert C Wilson, Athens, Ga., *Secretary*, C O Lee, La Fayette, Ind. *Chemistry*, *Chairman*, Arthur H Uhl, Madison, Wis., *Secretary*, Lewis C Britt, Corvallis, Ore. *Pharmacognosy and Pharmacology*, *Chairman*, Charles E Mollett, Missoula, Mont., *Secretary*, R D Bienfang, Norman, Okla. *Pharmaceutical Economics*, *Chairman*, John F McCloskey, New Orleans, La., *Secretary*, W Henry Rivard, Providence, R I.

National Association Boards of Pharmacy — *President*, W Mac Childs, Eldorado, Kansas, *Honorary President*, F H King, Delphos, Ohio, *Vice-Presidents*, George A Moulton, New Hampshire, John M Woodside, Pennsylvania, John Clemmer, Florida, Earl E Durham, Michigan, R C Schultz, Wyoming, John F Allen, Oregon, *Secretary*, H C Christensen, 130 N Wells St., Chicago, Ill., *Treasurer*, J W Gayle, Frankfort, Ky.

Conference Pharmaceutical Association Secretaries — *President*, J W Slocum, Indianola, Io., *First Vice-President*, Roy S Warnack, Los Angeles, Calif., *Second Vice-President*, Wm B Day, Chicago, Ill., *Secretary-Treasurer*, Carl G A Harring, 20 Glen Road, Newton Center, Mass., *Members of the Executive Committee*, F V McCullough, New Albany, Ind., R C Wilson, Athens, Ga., J Lester Hayman, Morgantown, W Va., Dennis E Murphy, Cincinnati, Ohio.

National Conference on Pharmaceutical Research — *Chairman*, E N Gathercoal, *Vice Chairman*, Wm J Husa, *Secretary*, John C Krantz, Jr., *Treasurer*, Fitzgerald Dunning, *Members of Executive Committee*, H V Army, Francis E Bibbins and Glenn L Jenkins.

THE NATIONAL ASSOCIATION OF RETAIL DRUGGISTS MEETS IN CINCINNATI, SEPTEMBER 23rd-27th

THE DRUG TRADES EXPOSITION

The Drug Trades Exposition will open its annual exposition October 15th, at the Grand Central Palace, New York City

PHARMACY WEEK WINDOW DISPLAYS

Chairman Anton Hogstad Jr, suggests that it will be found preferable to select one title for a display and build the entire exhibit around this. In a circular issued fifty titles are given for displays and these have been selected as a means of interesting the public and advancing the cause of pharmacy

THE NATIONAL ASSOCIATION OF INSECTICIDE AND DISINFECTANT MANUFACTURERS

At the annual convention of the National Association of Insecticide and Disinfectant Manufacturers in Chicago, a committee was appointed to take action on setting standards for household insecticides in an educational campaign

CHAPTER KAPPA PSI

The organization of a new graduate chapter of Kappa Psi, national pharmaceutical fraternity, by a group of University of Pittsburgh graduates, was announced at the Pennsylvania Pharmaceutical Association Convention. The following are officers and charter members

C E Rickard of Dormont, Pa, *Regent*, W J Hill, of Pittsburgh, Pa *Vice Regent*, E Reeves of Avalon, Pa *Secretary*, H A Krumpe, of Gibsonia, Pa, *Treasurer*, J W Wible, of Apollo, Pa, *Chaplain*, F J Steele, of Pittsburgh Pa *Historian*, C Schaefer of Pittsburgh, Pa, *Chairman of the By Laws Committee*, Dr L K Darbaker, of Wilkensburg Pa, R Taylor, of Greensburg Pa, E Claus, of Pittsburgh, Pa, G Young, of McKeesport, Pa, W Siegel, of Erie, Pa, R Miller of Pittsburgh, Pa

The officers and the charter members constitute the committee on By-Laws

PHARMACEUTICAL STANDARDS

The 1935 revised edition of the Manual of Pharmaceutical Standards including Tolerances and Methods of Analysis is ready for

distribution. This compilation, prepared by the Combined Pharmaceutical Contact Committee of the American Drug Manufacturers' Association and the American Pharmaceutical Manufacturers Association, with the cooperation of the Food and Drug Administration, U S Department of Agriculture consists of 17 monographs on Ampuls, 36 monographs on Compressed Tablets and 18 monographs on Hypodermic Tablets. The price of the manual is \$3.00. Copies may be obtained from the American Drug Manufacturers' Association 506 Albee Building, Washington D C, or from the American Pharmaceutical Manufacturers Association 246 High St, Newark N J

(Continued from page 729)

THOMAS H POTTS

Thomas H Potts, former secretary of the National Association of Retail druggists and later a field representative of the organization died August 12th. Mr Potts served the N A R D as secretary for a number of years, terminating this position in 1916. Illness incapacitated him and for several years he has been in poor health.

DR BENJAMIN LINCOLN ROBINSON

Dr Benjamin Lincoln Robinson, former curator of the Gray Herbarium at Harvard University and Asa Gray Professor Emeritus of Systematic Botany at the university died July 27th, at his Summer home in Jaffrey, N H. He was seventy years old. Prof Robinson who had served on the Harvard faculty for forty five years, was an authority on the flora of the United States, Mexico, tropical America and the Galapagos Islands. He was born in Bloomington, Ill, was graduated from Harvard in 1887 and received a Ph D degree from University of Strasbourg two years later.

Prof Lydia Rabinowitsch-Kempner, famous bacteriologist and associate of Robinson Koch in many of his most important investigations, died in Berlin, August 3rd. She was sixty four years old. She was graduated from the Universities of Zurich and Berne, and after taking her doctor's degree, joined the Institute for Infectious Diseases at Berlin, where, under the direction of Dr Koch, discoverer of the tubercle bacillus she was engaged in researches on the influence of heat on bacteria and pathogenic yeast specimens.



A group of A P H A members and members of their families in Portland, Oregon
Multnomah Hotel



HARVEY A HENRY

JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

VOL XXIV

SEPTEMBER, 1935

No 9

HARVEY A HENRY

Harvey Abner Henry, president of the National Association of Retail Druggists, 1934-1935, was born in Lebanon, Pa., February 16, 1884. He received his early education in the schools of Lebanon and, thereafter, was apprenticed to Joseph L. Lemberger, a former president of the AMERICAN PHARMACEUTICAL ASSOCIATION (1905-1906).

Mr. Henry matriculated at the Philadelphia College of Pharmacy and Science and was graduated with the degree of Doctor in Pharmacy, in 1906. After graduation he returned to the pharmacy of Joseph L. Lemberger and remained with his preceptor until 1913, when he removed to California where he has since then made his home in Los Angeles. In 1919, he opened a review course in Pharmacy to assist candidates in preparing for their State Board examinations.

In 1921, he formed a partnership with Glenn F. Coleman under the firm name of Henry & Coleman, they operate two pharmacies at present in the W. P. Story Building and an upstairs Prescription Pharmacy, and another in the Professional Building, at 6th and St. Paul streets—a corner professional pharmacy.

In 1929, Mr. Henry was elected president of the Southern California Pharmaceutical Association and, in 1933, the California Pharmaceutical Association honored him with the presidency. His advancement by the National Association of Retail Druggists began in 1932, by election as third vice-president and the following year as second vice-president. In 1934, Mr. Henry was elected chairman of the Executive Committee of the N. A. R. D., in the following year he was elected president of that organization and he presides this month at the Cincinnati meeting.

Mr. Henry is vice-president of Los Angeles Wholesale Drug Company.

EDITORIAL

E G EBERLE EDITOR

2215 Constitution Ave , WASHINGTON D C

MEMBERSHIP

DR ERNEST LITTLE points the way to another great cooperative effort which can be executed by the present members of the AMERICAN PHARMACEUTICAL ASSOCIATION. The need for this organization is well established. The importance of an aroused, active and representative membership is too well recognized to dwell upon it. To bring about the realization of this and improve our position Dr Little places the responsibility, or divides it, equally and rightly, and says, "Let's see what we can do." His plan furnishes each member an opportunity to do his full share by securing at least one new member. This should not be difficult to do. It is the way to a greater and more useful AMERICAN PHARMACEUTICAL ASSOCIATION. I hope each member will do his share and do it promptly.
—P H COSTELLO, *President*

LET'S SEE WHAT WE CAN DO

Some 400 members have just returned from the Eighty-Third Annual Meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION which was held in Portland, Oregon, from August 5th to 10th.

These members have returned home with greatly varying impressions of the importance of what transpired at this convention and I trust with many and varied ideas as to what can be done to further increase the usefulness of our ASSOCIATION to pharmacy, how to set about performing this very important service.

The report of one of our officers called attention to the fact that at the present time our ASSOCIATION is made up of but about 3000 members.

It is discouraging and somewhat surprising to learn that less than 3% of the 132,000 registered pharmacists in the United States are direct members of the AMERICAN PHARMACEUTICAL ASSOCIATION. I recognize that all state association members are affiliated members of the A P H A.

I would feel that I have done nothing of a constructive nature if I did no more than call to your attention the fact that our membership is exceedingly small. The important questions involved are "Why are so few of our registered pharmacists members of the AMERICAN PHARMACEUTICAL ASSOCIATION?" and "What can be done to improve existing conditions?"

We are all in agreement, I am sure, as to the need and absolute necessity of a strong parent organization to head up and direct all pharmaceutical activities, to constantly increase and improve the service which pharmacy is offering, and to increase the effectiveness and well-being of its practitioners. The small membership of the AMERICAN PHARMACEUTICAL ASSOCIATION is not due to the fact that there is no need for an organization of its scope and purposes.

It is not due to lack of talent and ability within the organization. At the Portland meeting our members had the privilege of listening to more than 300 scientific papers, committee and officers' reports, before the various divisions of the AMERICAN PHARMACEUTICAL ASSOCIATION and its related organizations. As

a group, these reports were of high quality. They indicated, very definitely, that we are possessed of our full share of talent and ability and that these talents are being successfully and effectively applied in a variety of ways and in many directions. The necessary talent is within our ranks.

I believe also that you will agree that the deplorably small membership in our ASSOCIATION is not due to lack of interest or effective endeavor on the part of our ASSOCIATION officers, the most important of whom is the secretary. It requires but one visit to our secretary's office to impress upon you his many and varied activities in behalf of pharmacy and the conscientious and efficient manner in which he is devoting himself to ASSOCIATION affairs.

The difficulty, as I see it, rests with the individual members of our ASSOCIATION, with you and with me. I know that such a statement is never a popular one. I know it may be resented by some individuals. My desire, however, is to prove helpful rather than complimentary.

Well do I remember the determined drive Dr. Robert L. Swain made during his term of office as president of the AMERICAN PHARMACEUTICAL ASSOCIATION to increase our membership. The fact that the results were disappointing is not to Dr. Swain's discredit. He pointed the way and organized the drive. In this detail his experience was the same as any other efficient leader would have encountered under such circumstances. Without the active support and cooperation of the individual members even the most effective and dynamic leader can accomplish but little.

My challenge is, let us stop shifting responsibilities to the shoulders of others—"Let's See What We Can Do."

There are few, if any, members of our ASSOCIATION who could not, with a minimum amount of effort on their part, secure at least one new member before the next annual meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION. It is possible that there are some members of our ASSOCIATION who are so situated that they could not induce even one pharmacist to join our ranks. This condition is more than offset by the fact that many of our members could, with a reasonable amount of effort, secure a dozen new members during the current year. What fine cooperation we would be showing President Costello if we, without any effort on his part, doubled the membership of the AMERICAN PHARMACEUTICAL ASSOCIATION during his administration, thus leaving him free to devote his time to problems of administration and organization. It can be done. Are *we* interested enough to do it?

I am to-day sending the following note

Dr. E. F. Kelly, Secretary,
AMERICAN PHARMACEUTICAL ASSOCIATION,
Washington, D. C.

Dear Dr. Kelly:

I shall endeavor and persistently strive to bring not less than six new members into the A. P. H. A. before the 1936 annual meeting. You may consider me definitely obligated to the above responsibility.

Yours for Pharmacy,
ERNEST LITTLE

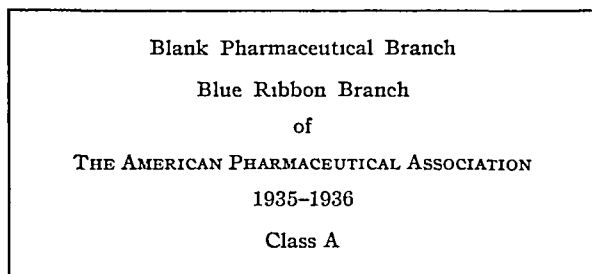
The membership year is the calendar year. Under the By-Laws membership taken between June and January may also cover the succeeding calendar year. It is, therefore, advantageous to join at this time. The Report of the Progress of Pharmacy including the Pharmaceutical Abstracts heretofore appearing in the YEAR BOOK, is now printed monthly in the JOURNAL, bringing this helpful review of the literature of pharmacy to the members each month. The JOURNAL is included in the dues.

I recommend and urge that all Sections of the A. P. H. A. adopt as one of their major projects for the year, the doubling of their membership by August 1, 1936, and that the undertaking be initiated by securing from each member of their section the promise that he will faithfully strive to obtain at least one new member for the A. P. H. A. as his contribution to this most worthy project.

I recommend that the various Branches urge their members to send to Secretary Kelly a letter similar to, if not identical with, the one given above, substituting any number which they may desire for the word "six," found in the first sentence of the letter.

I recommend also that during this "membership year" the JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION publish in a prominent place the names of our new members and the name of the member responsible for each new membership. It might be advisable also to publish each month an "Honor Roll," containing the names of the ten members of our ASSOCIATION who have secured the greatest number of new members and the record of each to date.

To further stimulate this effort for membership, I am glad to announce that the Northern New Jersey Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION will be pleased to present a pennant, each year for the next two years, to the Branch showing the highest percentage gain in membership during the year. This pennant might appear somewhat as follows:



I suggest that this pennant be prominently displayed at the annual convention and all the general meetings of the A. P. H. A. and that it then becomes the permanent possession of the successful Branch, which Branch shall have the privilege of having the pennant on display in the Headquarters Building in Washington, D. C., during the remainder of the year if desired.

I feel that two, or possibly three such pennants should be awarded each year to Classes A, B and C, depending upon the size of the Branches. Such a classification might make an award, based upon percentage of increase in membership more equitable. I would suggest also that no Branch be allowed to be the donor

of a pennant for more than two consecutive years, providing another Branch desires such privilege. Other necessary details can easily be worked out.

It is possible that there is but little of merit in the above suggestions. If such be the case, this article may still serve a useful purpose, provided it stimulates action on the part of our members and prompts some one to submit a better plan which can be put into immediate operation.

It is time to stop merely bewailing our small membership and weakly pointing the finger of responsibility at our national officers. Let us place the responsibility where it rightfully belongs—on the shoulders of the individual members and then "Let's See What *We* Can Do." What do you think? May we have your comments and suggestions?

THE EDUCATIONAL VALUE TO BE DERIVED FROM THE TRAVEL TO THE CONVENTIONS OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

ASIDE from the beauties of the section in which the Portland meeting was held, and its unsurpassed scenery, those who were privileged to attend were brought in contact with the history of the Northwest United States made known and resourceful by the Lewis and Clark Expedition.

In this issue of the JOURNAL a paper on the "Badianus Manuscript" is published—the original is in the Vatican Library and is believed to be the earliest herbal produced on this side of the Atlantic. Dr. Emily Walcott, of Johns Hopkins, Baltimore, is the author of a monograph concerning the Manuscript, an Aztec herbal, composed in the year 1552 in the famous College of Santa Cruz at Tlaltec-lolco, Mexico City.

The contribution is of interest because it deals with research in Mexico of about the time when the resources of this part of the New World were brought to the attention of Charles V, during whose reign the Spaniards conquered Mexico. In 1936 the AMERICAN PHARMACEUTICAL ASSOCIATION will hold its annual meeting in a section of the United States, celebrating the centennial of its independence from Mexico, a neighbor Republic with which cordial relations exist.

The meeting next year will make the members acquainted with the varied resources of the Southwest, developed by pioneers whose names reflected credit and honor, predominant among them—General Sam Houston with a splendid record as a member of Congress from Tennessee, Governor of that State, President of Texas, its Senator and its Governor. A man whose outstanding characteristics were honesty and loyalty, interested in the development of resources, in the establishment of educational institutions, he was one of the founders of Baylor University. Here lived for a time "O. Henry," a druggist in his earlier years. The Pharmacy School of the University of Texas is well equipped and its home is in one of the larger buildings on the Campus at Austin.

Several missions of the Franciscans—who in the earlier years cared for the sick and dispensed medicines—are still in a good state of preservation in San Antonio.

Mexico is launching an educational experiment in San Antonio—a library is to be established, partly supported by the Mexican Department of Education which will supply books and a librarian. It is hoped to expand the library into a cultural

center for Mexicans and furnish them with the means to enjoy their language literature

Every meeting brings opportunities for further acquaintance with our history, resources and contributions of the section to the wealth and health of our people

THE PRESCRIPTION DEPARTMENT

MUCH has been said and written about the "Open Prescription Department" Included in an article of a recent issue of the *Pharmaceutical Journal of New Zealand* is a reference to the pharmacy of the late John F Hancock, Baltimore, a former president of the AMERICAN PHARMACEUTICAL ASSOCIATION A picture of the interior is shown—the pharmacy is now owned by W F Thiede

The following, from reminiscences of the former (*about 1866*), will be of interest, communicated in a letter received from James E Hancock, son of the above named

The store was newly furnished in walnut with side glass cases and, back of the arch way the rear room was fitted up for prescription work with a central semi-circle of shelves for small bottles containing duplications from the large shop bottles in the front room The plans were carefully considered with a view to convenience economy of space and safety to the dispenser The prescription counter was placed in full view of those in the front room, but sufficiently retired to avoid conversation while prescriptions were being compounded "

It may be of further interest that Mr Thiede, the present owner, was asked why he had not remodeled the pharmacy and his reply was—"that the pharmacy was up-to-date "

Those who desire to read the article¹ referred to will find much of interest and value, the article is illustrated by drawings, drawn to scale A purpose of this comment is to present the ideas, on a subject of present-day interest, of a pharmacist who devotedly served his profession and was a faithful member of the ASSOCIATION for more than sixty years

IT IS DOING, AS WELL AS THE AIMS AND PURPOSES

IT IS ALL very well to contend that pharmacists should practice pharmacy—all will agree to that—but the conditions are with us that limit the opportunities This fact should impress the thought to shape the status so that a greater number can put their aims and purposes into practice

There are some, perhaps many, who prefer to conduct what is known as the modern drug store, but can pharmacy attain to a higher professional standard thereby? There will be rightful differences of opinion Many papers are written which seek to build on the foundation of existing conditions, but it is necessary to shape them with the end in view to remove the obstacles that hinder advancement, adherence to the code of ethics is an essential

The schools of pharmacy had their inception, not by replacing the drug stores, but by giving those in the practice of pharmacy an opportunity for a deeper knowledge of its activities and derive a living income therefrom

The AMERICAN PHARMACEUTICAL ASSOCIATION had its beginning, because the founders realized that inferior materia medica and lack of uniformity in prepara-

¹ PROCEEDINGS A PH A 1872 pages 192-200

tions interfered with rendering the right kind of service to the public and added directly or indirectly to the cost of production, the results of the efforts were better service, greater uniformity and an improved materia medica, and should have resulted in restricting the dispensing of medicines and sale of medicinal products to druggists. But as the latter recognized in the sale of side-lines, many of them foreign to their business or profession, an opportunity for increasing sales volume, so merchants ventured into merchandising medicines and products that properly belong to the drug stock. No exception is taken for the inclusion of side-lines nor is this intended for a discussion of the rights of merchants, for which the public is largely responsible.

Volume increase and profit are closely related, hence the step to competition, fair and unfair, by those who should seek, as far as is right, to cooperate. These practices have entered all lines and resulted in unfair means, which for the good of all should be corrected, for the nation and state are dependent on the relative prosperity of all classes and individuals.

An effort has been made in a very brief way by this comment to outline the developments which have brought about a more or less unsatisfactory status by removing from our business life a most valuable class of citizens, or at least reduced their number by bringing about unsatisfactory trade conditions.

Steps have been taken to correct unfair practices by states, but the federal government should join in the effort, for the prosperity of the nation depends upon that of the individuals engaged in whatever pursuit—success depends on proper relationship.

A STUDY OF THE ASSAY OF ACONITE AND THE STABILITY OF ITS PREPARATIONS

Investigators of the stabilization of Aconite preparations have reported that increased acidity of the preparation promotes stability. The statement has been checked in this paper and has been found to be correct. A chemical assay procedure for determining the amount of aconitine present in Aconite preparations has been worked out based on the dissociation constants of the alkaloids involved. The assay procedure is of such nature that by use of certain values obtained in the assay procedure, aconitine may be calculated in milligrams from an equation the derivation of which is given in full—George L. Baker and C. B. Jordan in a paper read before Scientific Section A. P. H. A., Portland meeting, 1935.

APOTHECARY SHOPS OF COLONIAL TIMES

A compilation of scattered historical data published in pharmaceutical literature and other sources of the past few years and describing apothecary shops, proprietors and distinguished customers of colonial days. The oldest American apothecary shop still in existence and doing business is the Rau Pharmacy in Bethlehem, Pa. The oldest record of an apothecary shop in America (1646) is that of Wm. Davies of Boston, Mass. This was probably the first store devoted exclusively to Pharmacy in America—Abstract of a paper presented by Millicent R. LaWall at the Portland A. P. H. A. meeting.

SCIENTIFIC SECTION

BOARD OF REVIEW OF PAPERS—*Chairman*, F E Bibbins George D Beal, L W Rising, H M Burlage L W Rowe, John C Krantz, Jr, Heber W Youngken

(*To be revised*)

A STUDY OF THE U S P THYROID ASSAY *¹

BY GEO D BEAL² AND CHESTER R SZALKOWSKI³

AUTHORS NOTE This paper is a drastic condensation of a lengthy report submitted to the United States Pharmacopœial Committee of Revision and presents only the authors' conclusions JOURNAL limitations have made it necessary to omit all detail and the comprehensive tables The senior author will be glad to furnish such details to any interested person

During the past year an unusual amount of criticism of the U S P X Thyroid assay has been heard, due primarily to a difference of interpretation of method in a case in Federal Court This led to a brief but critical study of the procedure, covering a period of three months Sixteen samples of desiccated thyroid or compressed tablets thereof were furnished by producers, who also favored us with criticisms and suggestions regarding the U S P X method In view of the limited time available, no thought was given to the determination of thyroxine content, but our attention was limited to the determination of the iodine content Also, in view of the fact that the U S P method was approved in principle by the manufacturer's chemists who dealt most extensively with this drug, no attempt was made to devise a new procedure We, on the contrary, directed all of our energies to the searching out of sources of error in the method, and the amplification of the directions in order that the pitfalls therein might be avoided

Practically all of the methods proposed for this assay have been based upon the original work of Baumann (1) Such an assay consists of three stages

- 1 Fusion with alkali, destroying the organic matter and binding the iodine as an iodide
- 2 Oxidation of the iodide to iodate
- 3 Iodometric determination of the iodate

The Fusion Mixture—Baumann destroyed organic matter by fusion with sodium hydroxide and nitrate Kendall (2) used both a solution of and solid potassium hydroxide with potassium nitrate Kelly and Husband (3) used a modification of Kendall's procedure, while Grutzner (4) used a mixture of sodium hydroxide and peroxide Kraus (5) and Hunter (6) used a mixture of sodium and potassium carbonates and potassium nitrate for the fusion, while Volhard (7), Hofmeister (8), Neuman and Meinertz (9), Oswald (10) and Middleton (11) have studied the different alkalies and their use in organic fusions Harden (12) proposed the use of the Eschka fusion mixture of sodium carbonate and magnesium oxide as used for the determination of sulphur in coal, in which atmospheric oxygen serves as the oxidizing ingredient

* Scientific Section A PH A Portland meeting 1935

¹ Contribution from the Mellon Institute of Industrial Research Pittsburgh, Pa Published by permission of the Chairman Committee of Revision, United States Pharmacopœia Assistant Director Mellon Institute

³ Formerly Assistant Department of Research in Pure Chemistry Mellon Institute

U S P X adopted Hunter's mixture, consisting of 138 parts by weight of anhydrous potassium carbonate, 106 parts of anhydrous sodium carbonate and 75 parts of potassium nitrate. This mixture forms during fusion the eutectic corresponding to potassium sodium carbonate, the fusion point of which is lower than either of its components, and does not have the tendency to creep and spatter that occurs when a caustic fusion mixture is used.

Fusion without an active oxidizing agent may produce apparently complete decomposition, but the sulphur of the tissue protein is not completely oxidized, so that the resulting solution either liberates hydrogen sulphide or precipitates sulphur on further treatment.

Temperature and Time of Fusion —The first defect in the U S P X direction is "Heat the crucible over a free Bunsen flame until no further carbonization is observed." Some analysts obeying this may use a strong and rapid heating while others may start with a very low flame and gradually increase the heat to the point of fusion. Results may vary because of this. Hunter recommended rapid fusion because it is safe as well as convenient. He did not observe any loss of iodine when heating thus, but found in controls that when heating was spread, by gradual increments, over one and one-half hours, results were considerably too low. Oswald also believed that rapid oxidation is least likely to cause a loss of iodine.

We find that either too rapid or too slow heating gives results that depart from the truth. Too rapid combustion causes loss of iodine by volatilization, as does a lower but much slower combustion. In our experience, the proper heat will bring the crucible and mass to a dull red in ten minutes, while holding this temperature for an additional ten minutes will yield a white fusion mass, the edges of which will have just begun to melt. No free carbon will be present, so that the solution will not require filtration, and no incompletely oxidized sulphur will be left. The mass, not having fused in its entirety, is friable and easily brought into solution in hot water.

Other advantages of the carbonate-nitrate fusion are apparent here. Carbon always remains after the caustic fusion unless a very large excess of nitrate is used. The Eschka mixture does not form a clear solution until it is acidified. The Eschka mixture also produces decided intumescence during heating.

Oxidation of Iodide to Iodate —This may be accomplished with such oxidizing agents as bromine, chlorine water, solutions of hypochlorites, and potassium permanganate. Of the halogen-oxidizing agents, bromine is perhaps more widely used, although it has many disadvantages, such as

- (a) It invariably contains iodine, and only painstaking washing with water will remove this.
- (b) Some of the nitrate forms nitrite during fusion and this in turn reduces bromine to bromide, which may interfere during the later treatment.
- (c) Excess bromine is removed by boiling with only great difficulty. Therefore an agent such as phenol or salicylic acid must be added to precipitate the bromine.

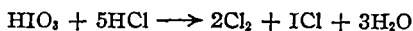
No one of our experiments involving the use of bromine was as successful as the U S P procedure. We are confident that the use of this oxidizing agent requires much more attention than does that of sodium hypochlorite.

Potassium permanganate is used in the U S P thyroxine assay, which is al-

most a micro-determination. An excess of permanganate must always be removed by another agent. Manganese under some conditions may catalyze the atmospheric oxidation of iodine solutions, and has been known to react with iodates.

Chlorine water and solutions of hypochlorites have one disadvantage, they may contain chlorates. Chlorine water is seldom used for the oxidation of iodide to iodate. Sodium hypochlorite, on the other hand, has two distinct advantages, *first*, it oxidizes iodide to iodate in alkaline solution, *second*, it supplies an excess of chlorine which prevents the loss of iodine upon acidification.

The use of sodium hypochlorite introduces considerable quantities of chloride. Later hydrochloric acid is liberated. Iodic acid may react with hydrochloric acid as follows



This not only requires a large excess of hydrochloric acid but the concentration must be quite high. Such a condition is practically impossible to attain in this assay. Even on addition of sodium chloride no measurable loss of iodine occurred.

The formation of chlorates in hypochlorite solutions depends upon the temperature. We have found that if the temperature of the solution obtained from the fusion exceeded 30°C , our results were higher than when the temperature at addition of the hypochlorite was $15\text{--}20^\circ \text{C}$. This is quite likely due to the formation of chlorate in the hypochlorite solution.

By means of Wilson's (13) method for the determination of hypochlorites by direct titration with sodium thiosulphate in the presence of acetic acid, a method in which chlorates remain unaffected, we have found that the rate of change from hypochlorite to chlorate is somewhat slower in a solution prepared from bleaching powder and sodium carbonate than in one prepared from sodium hydroxide and chlorine. Thus, we believe, contributes to the sharper end-point in the final titration, for the chlorate may perhaps oxidize iodide at that time. Such an error is minimized if a blank determination is carried through, but it is our opinion that even high blanks should be avoided.

We would say that the greatest differences of opinion among authors have to do with such essential factors as the acidity of the solution, the nature of the oxidizing agent, and the method of removing the excess. Kendall and Kelly (*loc cit*) are at absolute variance on the question of acidity if bromine be used as oxidizing agent, Kendall claiming that the p_{H} during bromine removal is of greatest importance, Kelly that it is a matter of little moment. We think that when the U S P procedure of oxidizing with hypochlorite is followed, the degree of acidity during the removal of excess chlorine is of considerable importance, although perhaps not so much so as the duration of or volume during boiling.

U S P X directs

"Treat the mixture with enough phosphoric acid, diluted with an equal volume of distilled water, to produce an appreciable yellow tint of free chlorine, add about 10 cc more of phosphoric acid, diluted with an equal volume of distilled water etc."

Such a procedure is very uncertain since this so-called yellow tint is not easily distinguished as a change from the slight tint of the hypochlorite solution. Guided by tint alone, we have been quite unsuccessful in gaging the acidity of our solution.

On the other hand, too large an excess of acid may cause the liberation of iodine from the iodate on boiling or it may interfere with the proper starch-iodine end-point. The acidity should be controlled by maintaining reasonable precision in the quantities of fusion mixture and of hypochlorite solution used. If one takes altogether 20 Gm of fusion mixture, as directed, and 50 cc of freshly prepared chlorinated soda T S, 60 cc of dilute phosphoric acid, prepared by diluting U S P acid with an equal volume of water, is ample.

U S P X then directs "Boil for half an hour or until the volume has been reduced to 150 cc." Hunter observed that after boiling for ten minutes the vapor gave no blue color with starch-iodide test paper, and from this point he heated for fifteen minutes longer. We have evaporated such solutions until the volume was below 150 cc, in some cases losing iodine and in others finding chlorine still in the solution. We believe that the volume before evaporation should be at least 300 cc and at the end not less than 150 cc, preferably 175 cc. The time of boiling ought to be not less than one and one-half hours, although no blue color is observed with starch-iodide paper held in the neck of the flask after one hour's boiling. To insure complete removal of chlorine, the solution ought to be boiled for at least one-half hour after no blue color is obtained.

Titration of the Iodine—Obviously the potassium iodide solution added to reduce the iodate must itself be free from iodate. Too little attention, however, is often paid to the starch T S. According to U S P X, the amount might be regarded as unlimited. Too great an excess will give a reddish color to the solution that will persist after the blue has been discharged. Hence, just enough should be added to give a sharp end-point, and in our experience 3 cc is ample, to be added just before the conclusion of the titration. Furthermore, starch T S prepared from pure arrowroot starch is the most sensitive and gives the sharpest end-point. This has been established by series of comparative titrations in which also potato, corn and soluble starches were used. The use of arrowroot starch T S is perhaps the one point on which there is nearly unanimous agreement among workers on thyroid.

Complaints are frequently heard about the fading or slipping of the end-point. It can be discharged and will return, and this may be repeated several times. Some believe that this may be due to the presence of iron or manganese. Hunter has shown that the presence of iron in the thyroid, or added in reasonable amounts before the fusion, does not affect the end-point. If manganese be present, for example, in the hypochlorite, the end-point will not be sharp and the results probably high.

If all of the factors herein discussed are carefully controlled, a sharp end-point should be obtained. We believe that if the solution does not show a return of the blue color until after at least thirty seconds, the true end-point has been reached. We have also found that traces of chlorine, bromine, or nitrous acid in the laboratory atmosphere may influence the slipping of the end-point.

A Blank Test—U S P X does not require that a control test be made. We believe that even if the purity of the reagents is assured, it is still important to accompany each set of determinations with a control test, and to apply the correction so established. The control test must start with the fusion, and may if desired be performed upon reagent casein to more nearly simulate the actual fusion.

The control will also take cognizance of the bulk of chlorate present. It must be constantly borne in mind that one is performing almost a micro-determination, and that a two-hundredth normal solution is being used in the titration. A blank of from 0.4 to 0.6 cc of thiosulphate at least will be regularly obtained by the experienced operator, which, on a 1-Gm sample of thyroid, means over 3 per cent of the total iodine present.

METHOD RECOMMENDED FOR U S P XI

The method recommended for incorporation in U S P XI agrees in principle with that official in U S P X. The changes that have been made are for the purpose of clarifying the directions and eliminating the uncertainties therein.

Procedure—Thoroughly mix 1 Gm of Thyroid, finely powdered and accurately weighed, with 15 Gm of an intimate mixture of 138 parts by weight of anhydrous potassium carbonate, 106 parts of anhydrous sodium carbonate and 75 parts of powdered potassium nitrate in a nickel crucible of about 125 cc capacity and spread an additional 5 Gm of this mixture evenly over the surface. Heat the crucible with the flame of a Bunsen burner at such a rate as to attain a dull red color in ten minutes and continue the heating at the same temperature for an additional ten minute period. At the end of this time the carbonaceous material is completely oxidized and the mixture has just begun to melt around the wall of the crucible. Cool the fusion mixture and place the crucible and contents in a 400 cc beaker. Add 150 cc of hot distilled water and stir until the contents of the crucible are completely dissolved. Transfer the solution to a 500 cc Erlenmeyer flask and rinse the beaker and crucible with four 10 cc portions of hot water adding the rinsings to the solution in the flask. Cool the solution to 15° C and add 50 cc of freshly prepared chlorinated soda T S. Cautiously add 60 cc of diluted phosphoric acid (made by mixing equal volumes of phosphoric acid and distilled water) place the flask on a hot plate and boil the solution until a strip of filter paper moistened with starch potassium iodide T S does not become blue when held in the vapor in the mouth of the flask. The final volume of solution in the flask must be about 175 cc, and distilled water must be added, if necessary, during the boiling to maintain this volume. Cool the solution to about 25° C and add 10 cc of a freshly prepared aqueous solution of potassium iodide (1 in 100). Titrate the liberated iodine with two hundredth normal sodium thiosulphate adding 3 cc of starch T S as indicator shortly before the end of the titration. Conduct a blank determination with the same quantities of the same reagents and subtract the volume of sodium thiosulphate consumed from that consumed by the Thyroid. Each cc of the corrected volume of two-hundredth normal sodium thiosulphate is equivalent to 0.0001058 Gm of iodine.

THE ASSAY OF COMPRESSED TABLETS OF THYROID SUBSTANCE

As a result of our study, it is shown that compressed tablets of thyroid can be assayed by the same method that is used for desiccated thyroid substance. Because of the presence of diluents in the tablets, a larger weight of the sample must be taken for the analysis. The quantity of oxidizing agent (potassium nitrate) in the 20 Gm of fusion mixture used is sufficient to completely decompose the diluents present, but the total time of heating should be extended to twenty-five minutes. No filtration of the solution is required after the fusion has been taken up in water. Although no monograph for thyroid tablets is included in U S P XI, directions for their assay are presented here.

Procedure—Select 50 perfect tablets or enough more than this number to make at least 3.5 Gm of sample weigh accurately and calculate the average weight per tablet. Finely powder the tablets in a clean, dry mortar. Mix 1.5 Gm of the powdered tablets accurately weighed with 15 Gm of an intimate mixture of 138 parts by weight of anhydrous potassium carbonate, 106 parts of anhydrous sodium carbonate and 75 parts of powdered potassium nitrate in a nickel

crucible of about 125 cc capacity, and spread an additional 5 Gm of this mixture evenly over the surface. Heat the crucible with the flame of a Bunsen burner at such a rate as to attain a dull red color in ten minutes and continue the heating at the same temperature for an additional fifteen minute period. Proceed as directed under the assay of thyroid, beginning with "Cool the fusion mixture." One cc of two hundredth normal sodium thiosulphate is equivalent to 0.0001058 Gm of iodine. Divide the weight of iodine found by the number of tablets represented by the weight of sample taken to find the weight of iodine per tablet.

Following these procedures as outlined, we have examined sixteen lots of desiccated thyroid powder and compressed, uncoated, tablets from various manufacturers. The results that we have obtained are found in Table I.

TABLE I —COMPARISON OF IODINE CONTENT OF THYROID

Sample	Producer's Claims	Laboratory Results by Revised Method
1	0.218 per cent	0.236 per cent
2	0.0155 mg /tab (Tablet)	0.0154 mg /tab
3	0.132 mg /tab (Tablet)	0.129 mg /tab
4		0.202 per cent
5		0.202 per cent
6	0.40 per cent	0.367 per cent
7	0.0612 per cent (Tablet)	0.061 per cent
		0.128 mg /tab
8	0.22 per cent	0.176 per cent
9	0.1408 mg /tab (Tablet)	0.124 mg /tab
		0.0757 per cent
10	0.0215 per cent (Tablet)	0.090 per cent
		0.0541 mg /tab
11	0.425-0.422 per cent	0.423 per cent
12	0.2368 mg /tab (Tablet)	0.240 mg /tab
		0.117 per cent
13	0.240 per cent	0.223 per cent
14		0.119 mg /tab
		0.0375 per cent
15	0.2251 per cent	0.237 per cent
16	0.0993 per cent (Tablet)	0.0994 per cent
		0.104 mg /tab

REFERENCES

- (1) Baumann *Z physiol Chem* 21, 1 (1898)
- (2) Kendall *J Biol Chem* 149 (1920)
- (3) Kelly and Husband *Biochem J*, 18, 951 (1924)
- (4) Grutzner *Chem Ztg* 769 (1914)
- (5) Kraus *J Biol Chem*, 22 215 (1915)
- (6) Hunter, *Ibid*, 7 321 (1909-1910)
- (7) Volhard *Annalen D Chem* 190 40
- (8) Hofmeister, *Z physiol Chem* 24, 163 (1898)
- (9) Neuman and Meinertz *Ibid*, 43 37 (1904)
- (10) Oswald, *Ibid* 27 31 (1899)
- (11) Middleton *Analyst*, 57, 604 (1932)
- (12) Harden, W., Hynson, Westcott and Dunning, private communication
- (13) Wilson, *Ind Eng Chem Anal Ed* 7, 44 (1935)

SOME PROPERTIES OF ERGOSTETRINE *

BY MARVIN R THOMPSON ¹

Since reporting the isolation of a new crystalline specific alkaloid of ergot (1), it becomes possible to describe some pharmacological and chemical properties of this "X-alkaloid" in pure crystalline form, earlier publications (2) having dealt with the amorphous substance still containing some ergotoxine as impurity. The history of the discovery of this new "X-alkaloid," named "ergostetrine" by the author, with the relationship of ergostetrine to the subsequently reported "ergometrine" of Dudley and Moir (3) and the "ergotocin" of Kharasch and Legault (4), is reviewed elsewhere (5).

ISOLATION AND CHEMICAL PROPERTIES (6, 7)

A 10-Kg quantity of good quality ergot was exhaustively extracted with alcohol and the alcohol was removed at a temperature not exceeding 40° C under reduced pressure. The resulting gummy mass was thoroughly washed with many small portions of acidified water to remove the impure ergostetrine. The aqueous washings were concentrated under reduced pressure, alkalized to litmus with ammonia, and exhaustively shaken out with many small portions of chloroform. Removal of the organic solvent *in vacuo* resulted in crystallization of ergostetrine. The crystals were washed with chloroform and dried *in vacuo* over calcium chloride. The yield was 983 mg. These crystals melted with decomposition at 148° to 150° C, and exhibited a specific rotation² (0.1% solution in chloroform containing 5% alcohol to increase solubility) of $[\alpha]_D^{25} = -45^\circ$ to 55° . One recrystallization from hot benzol raised the decomposition point to 152° to 154° C. Repeated recrystallization (5 times) from benzol resulted in white radiating, doubly refractive needles up to 1 1/4 inches in length, which, when placed in a bath at 154° C and slowly heated, melted with decomposition at 160° to 162 5° C, and whose specific rotation (0.2% solution in ethyl alcohol) was $[\alpha]_D^{30} = +50^\circ$ ($\pm 10^\circ$ because of weak solution used). Aqueous solutions were alkaline in reaction and also dextro-rotatory, as were solutions in methyl alcohol. Chloroform and benzol solutions were laevo-rotatory. Solutions of either the base or the salts exhibit a high degree of fluorescence. The base is sparingly soluble in water, chloroform and benzol, and is considerably more soluble in ether, ethyl and methyl alcohols. The salts are uniformly highly soluble in water, but much less so in common organic solvents. More precise determinations must await the availability of larger quantities of ergostetrine. Its presence in ergot to the extent of 0.05 to 0.2 mg per Gm introduces great difficulties in securing working quantities from small-scale laboratory production.

As to the molecular composition of ergostetrine, analyses mentioned in an earlier report (1, 2) showed the substance to consist of C, H, O and N, and that the ratio of these elements to one another was roughly similar to that of hitherto identified alkaloids (ergotoxine, ergotamine, sensibamine, etc.) but that the size of the molecule was definitely smaller than that of the known alkaloids. Due caution must be observed in assigning an empirical formula to the new alkaloid because,

* Scientific Section A Ph A, Portland meeting 1935, skeletonized by author to facilitate publication.

¹ Emerson Professor of Pharmacology, School of Pharmacy University of Maryland.

- I am indebted to Prof G L Jenkins for coöperation in determinations of optical activity.

though simpler in composition than the other alkaloids of ergot, it is still relatively complex. The crystals form in combination with solvent of crystallization, and the extreme difficulty with which the solvent of crystallization can be safely expelled attaches a definite element of doubt to any analytical results.

Dudley and Moir (3, 8, 9) presented analyses on their ergometrine, Kharasch and Legault (10) on their ergotocin, Stoll and Burckhardt (11) on their ergobasine, and Jacobs and Craig (12) on their alkaloid, all confirming my analyses showing the qualitative composition of the molecule and that the molecular weight is definitely less than that of either ergotoxine or ergotamine. It is the belief of the writer that ergostetrine, ergometrine, ergotocin and ergobasine are one and the same substance. All were independently obtained by chemical methods which, though differing in details, proceed in the same chemical direction, ultimately obtaining the crystals of the free base from chloroform, benzol, the chlor-ethylenes, etc., taking advantage of the lesser solubility of the new alkaloid as compared to the other alkaloids in these solvents. The pharmacologic and clinical activity, optical activity, decomposition point, solubility and color reactions, all tend to establish that the four names have been applied to the same alkaloid, in spite of the variously reported minor differences which are very probably due to differences in the degree of purity of the crystals studied. The empirical formula indicated by more recent analyses of ergostetrine (base) is in excellent agreement with that of Stoll and Burckhardt for ergobasine ($C_{19}H_{23}O_2N_3$), which is the same as that found by Jacobs and Craig for their product. The formula suggested with reservation by Kharasch and Legault for ergotocin ($C_{21}H_{27}O_3N_3$), as pointed out by Jacobs and Craig (12), differs from the above formula by C_2H_4O (or $C \cdot H_5OH$, alcohol¹), suggesting that the higher molecular weight may be due to analyses of material still containing some solvent of crystallization. Owing to the difficulties of completely freeing from solvent of crystallization, this lies well within the realm of possibility. The somewhat larger molecule suggested by the analyses of ergometrine by Dudley and Moir probably resulted from the same difficulty, or to some remaining impurity.

COLOR REACTIONS OF ERGOSTETRINE

As established in a previous report by the writer (1), ergostetrine gives the usual color reactions of ergot alkaloids. The well-known Van Urk color reaction as modified by the quantitative method of Smith appears to be the more sensitive in comparing the various alkaloids of ergot. Consequently the quantitative data presented were obtained by using this reaction. The reagent consisted of 0.125% *p*-dimethyl-amino-benzaldehyde and 0.1% ferric chloride in 50% (by volume) sulphuric acid. Two cc of a 1-10,000 solution of ergostetrine (base), mixed with 4.0 cc of the reagent, produced a blue color approximately $2\frac{1}{2}$ times as intense as U. S. P. Standard Ergotoxine ethanesulphonate under identical treatment. When 2.0 cc of ergostetrine (base) 1-20,000 was compared with 2.0 cc of the standard ergotoxine ethanesulphonate 1-10,000, the color intensity as determined in the colorimeter was essentially identical. Thus, ergostetrine base produced a color reaction twice as intense as U. S. P. standard ergotoxine ethanesulphonate. Calculating both in terms of free base, the color produced by ergostetrine is approximately 1.68 times as intense as that produced by the ergotoxine represented in the U. S. P. standard salt of ergotoxine. The difference in solvent of crystallization would, of course, account

for some deviation from the above figures, the ergostetrine being crystallized from benzol as above described

These color reactions, therefore, offer no possibility for assaying ergostetrine in ergot preparations without resorting to prior chemical separation of the alkaloids, except as explained in the earlier report (2), in which it was pointed out that simple extracts exhibiting satisfactory color values would necessarily contain all of the ergostetrine present in the parent drug plus variable amounts of the other alkaloids, because of the greater stability and solubility of ergostetrine in the usual menstrua (water or water with alcohol) in the presence of the other alkaloids

ACTION OF ERGOSTETRINE ON THE COCKSCOMB

As pointed out in an earlier report (1, 2), ergostetrine is intensely active in producing cyanosis of the combs of cockerels. Adhering to the U S P procedure, perceptible cyanosis was produced in the combs of some cocks in doses as low as 0.05 mg per Kg. Others were more resistant, but in approximately 50 trials, a dose of 0.1 mg per Kg always produced a definite cyanosis. Doses of 0.1 mg per Kg and upward also produced the characteristic general depression or narcotic symptoms of ergot in the cockerels. Using birds standardized with U S P standard ergotoxine ethanesulphonate, the pure crystalline ergostetrine base was judged to be approximately 160% ($\pm 20\%$) as potent as the standard ergotoxine salt. In general, it was also noted that the cyanosis developed somewhat more quickly in the case of ergostetrine, and that the cyanosis was characterized by a deeper blue-black color in the combs than that produced by ergotoxine or ergotamine, in which blanching is often but not always observed. It is believed that the more prompt action of ergostetrine may result in the actual trapping of more blood in the combs, thus accounting for the more intense darkening, whereas the action of the other alkaloids being slower, forces much more of the blood out into the general circulation before finally trapping the remainder for subsequent exhausting of oxygen to produce cyanosis. In any case, the difference between ergostetrine and the other alkaloids is by no means well-defined, the observation being purely a general impression formed by experience with many tests.

Thus, the official Cockscornb method is not specific in measuring the more important ergostetrine activity in ergot preparations also containing the other alkaloids. The limitations of the method are the same as those mentioned for the colorimetric method.

ACTION ON THE ISOLATED RABBIT UTERUS

The action of pure crystalline ergostetrine on the isolated rabbit uterus shows that the amorphous substance previously reported upon (2) still contained some ergotoxine. Studies with pure ergostetrine reveal that, in marked contrast to ergotoxine, ergotamine, sensibamine and ergoclavine, the rabbit uterus is stimulated into strong contractions by ergostetrine. A study of the illustrations in Figs 1, 2 and 3 shows the stimulative response of the uterine strips to epinephrine and ergostetrine, that ergostetrine inhibits the epinephrine response to only a relatively slight degree, as compared with ergotoxine or ergotamine, and that ergotoxine inhibits or abolishes the stimulative activity of both epinephrine and ergostetrine. This indicates that ergostetrine mainly stimulates sympathetic endings in the rabbit

uterus, gradually giving way to only a slight depression, whereas ergotoxine, ergotamine, sensibamine and ergoclavine are indistinguishable in being mainly depressant to the same sympathetic endings

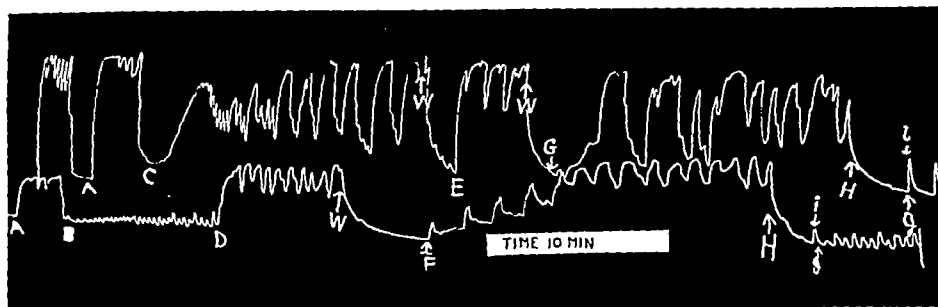


Fig 1—Isolated strips of rabbit uterus in 50-cc tissue chambers (Used third day after removal from rabbit)

- A—contraction from 0.05 mg epinephrine
- B—slight stimulation from 0.2 mg ergostetrine
- C—strong contractions from 0.4 mg ergostetrine
- D—contraction from 0.05 mg epinephrine showing no inhibition by the 0.2 mg dose of ergostetrine
- E—contraction from 0.05 mg epinephrine showing no inhibition by the 0.4 mg dose of ergostetrine
- F & G—strong contraction from 0.4 mg ergostetrine
- H & H—abolition of ergostetrine contractions by 0.05 mg of ergotoxine
- I—failure of 0.4 mg ergostetrine to cause typical contractions after the ergotoxine
- J—failure of 0.05 mg epinephrine to cause typical contractions after the ergotoxine
- W—replacement of drugged Lock Ringer solution with new solution

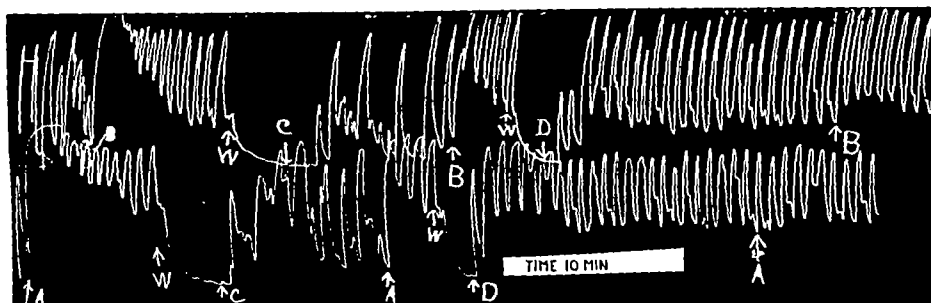


Fig 2—Isolated strips of rabbit uterus as in Fig 1 (Used third day after removal from rabbit)

- A—contraction from 0.05 mg epinephrine (lower tracing)
- B—contraction from 0.05 mg epinephrine (upper tracing)
- C—contractions from 0.4 mg ergostetrine
- D—contractions from 1.0 mg ergostetrine. Note the definite inhibition of the final epinephrine response produced by these large doses of ergostetrine. Ergotoxine in less than one-tenth this dose of ergostetrine causes as great or greater inhibition of the epinephrine response
- W—wash

Thus the well-known Broom-Clark method can measure the ergotoxine type of activity in ergot preparations, but the presence of even small amounts of ergotoxine in such preparations eliminates the possibility of the use of the isolated rabbit uterus to estimate ergostetrine unless complete chemical separation is first resorted to

Considerable variation in sensitivity to ergostetrine was observed in different uteri, as was to be expected. A concentration of 1 3,000,000 caused contractions with an increase in tone with the most sensitive uterine strips, whereas 1 500,000 was necessary to produce definite stimulation in others. Uteri used immediately after removal from the rabbit were the most sensitive. The longer the uterus is kept in the refrigerator before use, the less sensitive become strips from that uterus. After the fourth day in the refrigerator, it has become customary in this laboratory to discard any remainder of the uterus, because ergostetrine in a concentration of 1 50,000 or higher is then often found to be necessary to evoke satisfactory response.

The isolated rabbit uterus provides an excellent method of assaying different

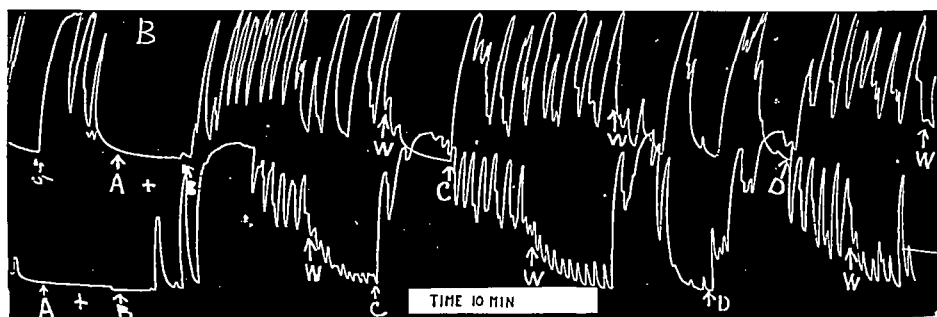


Fig 3—Similar strips of rabbit uterus as in Fig 1 and 2 (Used third day after removal from rabbit)

- A—absence of response to 0.1 mg ergostetrine
- B—strong contractions when additional 0.4 mg ergostetrine added
- C—strong contractions from 0.5 mg ergostetrine
- D—weaker stimulation from 0.4 mg ergostetrine
- W—wash

lots of ergostetrine in terms of a lot preserved *in vacuo* as the standard, since repeated doses produce satisfactorily constant responses in proportion to size of dosage

ACTION ON ISOLATED GUINEA PIG UTERI

Immature virgin guinea pig uteri (as used in Pituitary assays) are much more sensitive to ergostetrine than rabbit uteri (as used in the Broom-Clark procedure). Strong contractions are produced in all types of guinea pig uteri, and this tissue is, therefore, serviceable in assaying different lots of ergostetrine in terms of a lot preserved as a standard. The presence of histamine, tyramine, etc., and the other alkaloids in ergot preparations makes the method worthless for assay purposes, unless such crude preparations are subjected to chemical procedures for separating the various constituents.

ACTION ON CAROTID BLOOD PRESSURE OF ANESTHETIZED CATS AND DOGS

Given orally, the blood pressure is not raised by ergostetrine. Intravenously, the substance usually produces a pressor effect, as described earlier (2), but relatively

enormous doses of crystalline ergostetrine failed to produce the well-known "vasomotor reversal" or reversal of the effect of epinephrine. The production of the "reversal" by the amorphous alkaloid reported earlier (2) shows that the amorphous product still contained appreciable amounts of ergotoxine. Perhaps acutely toxic doses of pure ergostetrine might inhibit the pressor effect of epinephrine to some extent (as observed with ergostetrine and epinephrine on the rabbit uterus) but doses of 2.0 mg per Kg to dogs or cats failed to demonstrate the "epinephrine-reversal" or indeed a definite inhibition of epinephrine response. The pressor effects were feeble when compared with ergotoxine or ergotamine, and a depressor effect was occasionally observed. Chlorotone was used as the anesthetic.

ACTION ON PREGNANT CATS

This was described in the earlier report (2), the chief characteristic being that ergostetrine acts much more promptly and powerfully than ergotoxine, ergotamine, etc. The crystalline product was effective in smaller doses than the amorphous product. This method has little quantitative value.

ACTION ON PUERPERAL HUMANS

This was described elsewhere by Koff (13) for the amorphous product. Studies on the clinical effect of crystalline ergostetrine are described elsewhere by Tuck (14) and others (3, 15). The clinical results now available have caused the obstetricians involved to refer to the new alkaloid as "the true active principle" of ergot. It appears to account for the greater part of the traditional oxytocic activity of whole ergot, being far more effective than any constituent of ergot hitherto investigated. The ergotocin of Kharasch and Legault and the ergometrine of Dudley and Moir are apparently indistinguishable from ergostetrine in clinical effectiveness (3, 13, 14, 15, etc.), supporting the view that all three are identical.

The sensibamine used in these studies was obtained in the form of "Ergone," distributed by Parke, Davis & Co. The ergoclavine was kindly supplied by Dr Joseph Rosin, Merck & Co.

REFERENCES

- (1) Thompson, Scientific Section, Washington meeting of the A. P. H. A., May 10, 1934.
- (2) Thompson, Doctorate dissertation, Johns Hopkins University, 1934, abstracts published in *Jour. A. P. H. A.*, 21, 853 (1932), 21, 1135 (1932), 22, 736 (1932), 24, 24 (1935), 24, 185 (1935).
- (3) Dudley and Moir, *Brit. Med. J.* (Mar 16, 1935).
- (4) Kharasch and Legault, *Science* 81, 388 (1935).
- (5) Thompson, *Ibid.*, 81, 636 (1935) and 82, 62 (1935).
- (6) Thompson, U. S. Patent application No. 740,199 (Relating to Crystalline Ergostetrine).
- (7) Thompson, U. S. Patent application No. 30,153 (Relating to a Purified Fluid Ergot containing Ergostetrine in Standardized Quantities).
- (8) Dudley and Moir, *Brit. Med. J.* (Apr 6, 1935).
- (9) Dudley and Moir, *Ibid.* (Apr 13, 1935).
- (10) Kharasch and Legault, *J. Am. Chem. Soc.*, 57, 1140 (1935).
- (11) Stoll and Burckhardt, *Bull. sci. pharmacol.*, 42, 257 (1935), and *Compt. rend.*, 200, 1680 (1935).
- (12) Jacobs and Craig, *Science* 82, 16 (1935).
- (13) Koff, *Surg., Gynecol. and Obstet.*, 60, 190 (1935).
- (14) Tuck, "A Clinical Test of the Newly Recognized Oxytocic Principle of Ergot and a New Method of Administration." In press.
- (15) Davis, Adair, Rogers, Kharasch and Legault, *Am. J. Obstet. and Gynecol.*, 29, 155 (1935).

A STUDY OF THE ANESTHETIC PROPERTIES OF TRICHLORETHYLENE *¹

BY JOHN C KRANTZ, JR , C JELLEFF CARR AND RUTH MUSSER

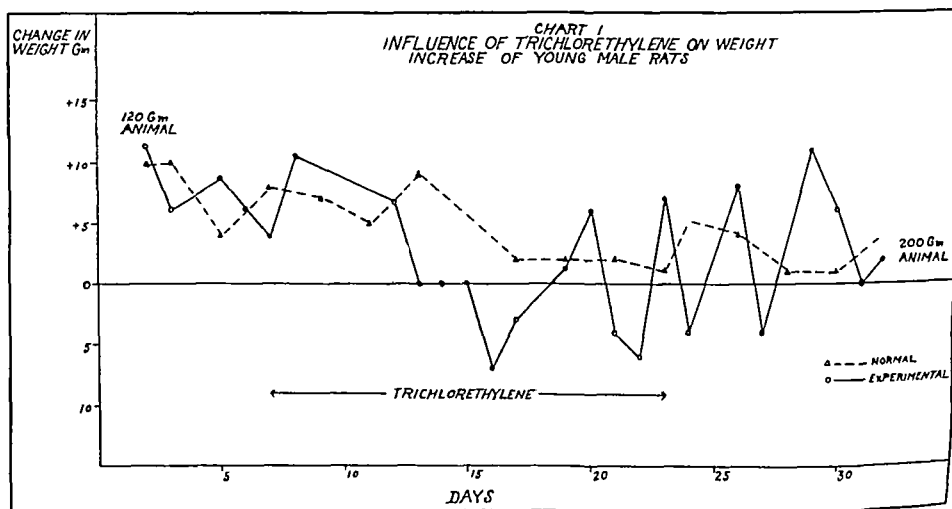
INTRODUCTION

Since the work of Plessner (1) trichlorethylene has had a rather extensive use in the treatment of trigeminal neuralgia. The pharmacology of trichlorethylene was studied extensively along with other chlorinated ethylene compounds by Joachimaglu (2). Owing to the fact that this compound was used by Love (3) in the treatment of angina pectoris, its action on the coronary vessels (4) and on the perfused leg vessels of the frog (5) was studied by the authors. During these investigations, the anesthetic properties of the drug were investigated and are reported in this communication.

EXPERIMENTAL

Material Employed—The trichlorethylene used in these experiments was supplied through the courtesy of David A Bryce of the Calco Chemical Co and met the requirements set forth by Tschentke (6).

Inhalation Anesthesia in the Albino Rat—Rats weighing 120–175 Gm were placed under a bell jar and 1 cc of trichlorethylene was permitted to volatilize



in the atmosphere of the jar. Within 4 to 5 minutes, the rats were usually under surgical anesthesia. The animals were then removed from the jar and allowed to recover. The recovery was prompt, generally occurring within 10 minutes. The treatment was repeated six times weekly over a period of five weeks. A summary of the effect of this treatment on 4 rats along with a control growth curve is shown in Chart 1.

* Scientific Section A PH A, Portland meeting 1935

¹ From the Department of Pharmacology School of Medicine University of Maryland

Four additional experiments were conducted with mature male rats weighing between 200 and 250 Gm. In these experiments, the animals did not suffer a loss in weight after 19 consecutive daily anesthetics.

On the twentieth day, the four larger rats were killed by decapitation and the parenchymatous viscera were examined by C. G. Warner of the Department of Pathology. In gross, the appearance of the rats was normal. There were some histological changes in the kidneys that were fairly constant in the exposed animals and practically absent in the controls. These were congestion and dilatation of the glomerular tufts with occasional hemorrhage in the proximal tubules. Granular changes in the cytoplasm of liver cells were inconstant and not conclusive. The lungs of the exposed animals showed some emphysema and intraalveolar hemorrhage.

Rectal Anesthesia in the Rabbit—Trichlorethylene was dissolved in various concentrations in mixtures of ethyl alcohol, glycerin and castor oil. These solutions were administered to rabbits (24 animals) by high rectal injections in amounts to provide 3.7 cc of the drug per kilo. By this avenue of entrance, the trichlorethylene was ineffective in producing anesthesia. The drug was exceedingly irritating to the colonic mucosa.

Influence of Inhalation Anesthesia on Blood Sugar Level—Rabbits weighing about 2 kilos were anesthetized according to the technique set forth in the anesthesia experiments using 5 cc of trichlorethylene. Prior to anesthetizing, the animals were fasted for 24 hours. Their fasting blood sugars were determined by the Folin method (7) and also determined subsequently as shown in Table I.

TABLE I—INFLUENCE OF TRICHLORETHYLENE ANESTHESIA ON BLOOD SUGAR OF RABBITS

Rabbit No	Fasting	Mg per 100 Cc of Blood Deep Anesthesia	Recovery (20 Minutes)
1	107	126	118
2	105	112	125
3	91	116	118
4	104	93	119
5	111	121	137
6	91	131	121

TABLE II—SHOWS RISE AND FALL OF BLOOD PRESSURE AND CHANGES IN RESPIRATION FOLLOWING STIMULATION OF THE SCIATIC NERVE BEFORE AND AFTER LOCAL APPLICATION OF TRICHLORETHYLENE TO THE SCIATIC NERVE. TWO EXPERIMENTS, SEPTEMBER 13 AND 15, 1934

No	Stimulation of the Sciatic Nerve	Blood Pressure Measured by a Mercury Manometer				Respirations per Minute		
		Before mm	After mm	Fall mm	Rise mm	Before No	After No	Change No
Dog 1								
1	Normal, before trichlorethylene	160	170		10	18	20	+ 2
2	Trichlorethylene peripherally	160	172		12	20	10	— 10
3	Trichlorethylene centrally	164	170		6	10	20	+ 10
4	Trichlorethylene peripherally	164	170		6	18	22	+ 4
5	Trichlorethylene centrally	164	172		8	18	22	+ 4
6	Trichlorethylene by tracheal inhalation	164	140	24		30	160	+130
7	Trichlorethylene by tracheal inhalation	164	152	12		90	70	— 20
Dog 2								
1	Normal, before trichlorethylene	130	136		6	15	20	+ 5
2	Trichlorethylene peripherally	130	136		6	15	20	+ 5
3	Trichlorethylene centrally	130	136		6	15	19	+ 4

Trichlorethylene on Nerve Conductivity—To determine the capacity of trichlorethylene to block nerve conductivity, an area of the sciatic nerve of a dog anesthetized with ether was exposed and subjected to faradization and the respiratory and blood-pressure responses were noted. A sling of trichlorethylene was placed around the nerve for several minutes and the nerve stimulated peripheral to the sling. These experiments are also shown in Table II.

SUMMARY

Trichlorethylene may be used by inhalation to produce anesthesia in the rat. The anesthesia in the rat and rabbit is accompanied by marked stimulation of the skeletal musculature. Repeated anesthetizing did not markedly influence the growth or important viscera of the rat. The compound was incapable of producing anesthesia when administered rectally. During inhalation anesthesia in the rabbit, a mild hyperglycemia results. Trichlorethylene applied to the sciatic nerve, was incapable of blocking the blood pressure and respiratory responses of faradization.

REFERENCES

- (1) Plessner *Klin Wochschr*, 53, 25 (1916)
- (2) Joachimaglu, *Berl Klin Wochschr* 58 147 (1921)
- (3) Love, a personal communication
- (4) Krantz, Carr, Musser and Harne, *J Pharm and Exp Therap* 54, 327 (1935)
- (5) Krantz Carr and Harne, *Proc Soc Exp Biol Med*, 32, 334 (1934)
- (6) Tschentke *Ind Eng Chem, Analyt Ed*, 6 21 (1934)
- (7) Folin *J Biol Chem*, 77, 421 (1928)

A SIMPLIFIED ASSAY FOR THE OFFICIAL IODINE-IODIDE SOLUTIONS *¹

BY WILLIAM F REINDOLLAR ²

Solutions of iodine, containing potassium iodide, have been employed as therapeutic agents since the recognition of the germicidal properties of the former substance. Two of the most important of these products are the tincture and the compound solution of iodine. The former is an alcoholic liquid containing 7 Gm of iodine and 5 Gm of potassium iodide in 100 cc, the latter is an aqueous fluid having 5 Gm and 10 Gm, respectively, of iodine and potassium iodide in each 100 cc. These two galenicals have enjoyed recognition in the last five Pharmacopœias, and have both been accepted by the Committee on Scope of the forthcoming Standard. Furthermore an Antiseptic Solution of Iodine (1), having a concentration of 2.0 Gm of iodine and 2.4 Gm of potassium iodide, respectively, in 100 cc is being considered for admission.

The U S P provides assays for the iodine and potassium iodide content of both of these agents. The respective assays are similar in each case and are herein briefly described.

* Scientific Section A. P. H. A. Portland meeting 1935

¹ Contribution of Bureau of Chemistry State of Maryland Department of Health

² The author wishes to express his appreciation to Dr William M Thornton Professor of Analytical Chemistry of the Johns Hopkins University, for helpful suggestions offered during the course of this work.

Potassium Iodide—A measured quantity of the solution is evaporated to dryness on a water-bath, small successive portions of distilled water are added from time to time until the iodine has been completely volatilized, the dried residue is weighed and qualitative tests for the potassium and iodide ions are made

Iodine is determined volumetrically upon a measured aliquot by titration with 0.1N sodium thiosulphate solution

These assays embody several undesirable features

(a) The determinations require two 5 cc portions Tincture of Iodine is marketed to day largely in small individual bottles which frequently contain less than 10 cc This condition requires the purchase and mixing of two samples

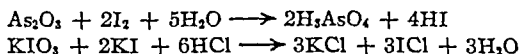
(b) The assay for potassium iodide is in fact a total solids determination Provided that sufficient potassium iodide be added to respond to the qualitative tests, a much cheaper salt might be substituted for the balance, and escape detection

(c) The determination of potassium iodide, particularly in the case of the compound solution is time consuming, four hours are required for some samples

(d) Sodium thiosulphate solution, unless carefully prepared and preserved will deteriorate and require frequent standardization

The recognition of these defects has lead to the proposals of numerous other procedures for the determination of one or both of the ingredients Among those suggested have been the determination of iodine colorimetrically (2) and by converting to iodide with zinc and precipitating with silver nitrate (3), the determination of potassium iodide argentimetrically (4), or by difference after determining free and total iodine (6, 7) Other assays (8, 9, 10) employ modifications of the iodine cyanide method of Rudolf Lang (11) The following procedure, devised in this laboratory is believed to be simpler than any of the foregoing and to be free from the objections raised against the official methods

Five cc of the solution is measured into an iodine flask and the free halogen is titrated with 0.1N alkaline potassium arsenite solution using starch indicator Fifty cc of concentrated hydrochloric acid and 5 cc of chloroform are then added, the mixture is well cooled and then titrated with M/20 potassium iodate solution until the chloroform layer is colorless The iodine may be calculated from the number of cc of 0.1N potassium arsenite required, the potassium iodide from the difference in cc, between the amounts of potassium iodate and potassium arsenite solutions used The reactions may be represented by the following equations



EXPERIMENTAL

The volumetric reagents were prepared from C P chemicals The arsenite and thio-sulphate solutions were standardized with Baker's reagent iodine, the iodate solution with Bureau of Standards arsenic trioxide The 0.1N potassium arsenite solution was made to contain a definite excess of potassium bicarbonate as recommended by Gooch (12) to neutralize the hydriodic acid formed

A comparative study of this and the U S P assays was made upon three galenicals, Tincture of Iodine U S P X, Antiseptic Solution of Iodine, U S P XI (proposed), and Compound Solution of Iodine U S P X The first and last were obtained by mixing the residues of a number of previously assayed samples, known to approximate the proper concentrations, the second was carefully prepared from U S P chemicals The results of this investigation are tabulated

Sample	Iodine		Potassium Iodide	
	U S P	Volumetric	U S P	Volumetric
Tincture of Iodine X	7 42	7 42	5 38	5 48
	7 42	7 45	5 36	5 44
	7 43	7 44	5 42	5 36
	7 43	7 43	5 42	5 38
Tincture Iodine XI	1 98	2 00	2 40	2 42
	2 00	2 00	2 42	2 45
	1 99	2 00	2 43	2 42
	2 00	2 00	2 44	2 43
Lugol's Solution	4 70	4 70	10 16	10 15
	4 67	4 72	10 12	10 10
	4 70	4 69	10 14	10 12
	4 70	4 68	10 18	10 11

DISCUSSION

Owing to the high concentration of potassium iodide in Lugol's Solution the amount taken for assay was 4 cc, in addition the volume of concentrated hydrochloric acid was increased to 75 cc for this product and for the U S P X tincture. Slight modifications of the quantity taken for assay, in order to maintain proper concentrations will make this method applicable to Churchill's Tincture of Iodine or any similar preparation. The results of this assay compare favorably with those obtained by the U S P method and the following advantages are claimed for it: (a) It permits the estimation of the two constituents upon one portion, thus conserving the sample, (b) it employs, for the estimation of iodine, a solution that is not only quite stable, but one that may be prepared directly from arsenic trioxide—a primary standard, (c) it substitutes a volumetric for a gravimetric estimation in the potassium iodide determination, hence is less time consuming, (d) in the latter portion of the assay it employs a reagent that is specific for the iodide ion.

SUMMARY

A new assay has been devised for Iodine-Iodide Solutions.

The results obtained by this method are in good agreement with those secured by the United States Pharmacopœia.

REFERENCES

- (1) United States Pharmacopœia XI, Circular of the General Committee, page 1891
- (2) Aufschnaiter P. *Scienza farm.*, 1 16 (1933)
- (3) Favrel G. *Ann de Chem Analyt.* 16 12 (1911)
- (4) Stanier C. and Leclercq L. *J pharm Belg.*, 14 283 (1932)
- (5) Neumann A. *Pharm Ztg* 75, 532 (1930)
- (6) Berg R. and Teitelbaum N. *Ibid* 72 1060 (1927)
- (7) Herzog J. and Schulze K. *Apoth Ztg*, 42, 804 (1927)
- (8) v Bruchhausen F. and Stempel B. *Ibid*, 42 282 (1927)
- (9) Rupp E. *loc cit*, 42, 317 (1927)
- (10) Matthes H. and Brause G. *Pharm Ztg*, 72, 519 (1927)
- (11) Lang R. *Z anorg allgem Chem* 122 332 (1922)
- (12) F. A. Gooch. Representative Procedures in Quantitative Chemical Analysis,"

John Wiley and Sons Inc. New York 1916 page 163

THE PHARMACOPŒIA OF THE UNITED STATES AND THE FEDERAL
FOOD AND DRUGS ACT *

J H BEAL, FORT WALTON, FLORIDA

The primary purpose of a pharmacopœia is to present a list of approved medicinal agents which have been standardized as to identity, purity and strength, so that the same title shall always apply to a substance of the same properties and potency. Even a layman can understand the danger to human life if the title "Tincture of Aconite" referred to a preparation of one strength in Portland, Oregon, and to one of a different strength in Portland, Maine.

In all of medicine and pharmacy there is probably no matter of greater importance than the principle that drug preparations dispensed under the same title shall always possess the same essential properties and be of the same potency. Accordingly in every country having a national pharmacopœia it is the custom to consider that the official title of a drug, unqualified by other words, always refers to a drug having the identity, strength, quality and purity prescribed in the pharmacopœia of that country. If this were not true the primary purpose of a national pharmacopœia would be defeated.

Practically every civilized nation has an official pharmacopœia governing the character and strength of the medicinal agents dispensed on physicians' prescriptions within its own territorial limits. In countries other than the United States the committees which revise their several pharmacopœias are appointed by some political department of their respective governments, whereas the Committee of Revision of the Pharmacopœia of the United States is elected by a convention of physicians and pharmacists, and of other professional and scientific men who are in some way concerned with the production or use of drugs and medicines.

ORIGIN AND METHOD OF REVISION OF THE PHARMACOPŒIA OF THE UNITED STATES

The Pharmacopœia of the United States belongs to and is under the absolute and complete control of the United States Pharmacopœial Convention, a society which has had a continuous existence of one hundred and fifteen years, in which period it has issued ten revisions of the Pharmacopœia, the Eleventh Decennial Revision being now in process of printing.

The United States Pharmacopœial Convention originated as a voluntary national association of physicians in 1820, and continued as a voluntary association, first of physicians only, and later of physicians and pharmacists, for eighty years. In 1900 the Convention was incorporated under the laws of the District of Columbia, and its membership now includes not only physicians and pharmacists, but also representatives of numerous scientific institutions and societies, and societies of law enforcement officials.

At the last assembly of the Convention in Washington in 1930 its membership included delegates from the American Medical Association, the AMERICAN PHARMACEUTICAL ASSOCIATION, the American Chemical Society, and from four other national societies relating to medicine, pharmacy or chemistry, from four national societies of officials who are charged with the duty of enforcing either

* Presented at the 83rd annual meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION
Portland, Oregon, Aug 5-10, 1935

national or state food and drug laws, from six departments or divisions of the U S Government which are concerned with medicine or with the enforcement of Federal drug laws, from forty-five medical colleges and university medical departments, from fifty-five colleges of pharmacy and university departments of pharmacy, and from twelve other colleges and universities. In addition to delegates from colleges and universities there were representatives from sixteen state medical societies, from thirty-six state pharmaceutical societies, and from eighteen other institutions and societies having to do with the medical sciences.

Of the more than four hundred delegates present at the 1930 meeting of the U S P Convention, only nine represented societies directly connected with trade or industry, so that the influence of commercial interests in the making of the Pharmacopœia may be regarded as practically nil.

This Convention of Delegates has absolute control of the affairs of the Pharmacopœia in every particular. It elects and instructs the Board of Trustees and the General Committee of Revision, and every act of these two bodies is subject to revision or disallowance by the next assembly of the Convention.

The General Revision Committee of fifty members in turn elects a smaller Executive Committee which directly handles the revision work, all decisions of the latter being subject to approval by the General Committee.

The members of the Board of Trustees, which handles the financial and business affairs of the Pharmacopœia between assemblies of the Convention, receive only their actual traveling and clerical expenses incurred in the service of their office. Any profit from sales of the Pharmacopœia must be devoted to research work upon pharmacopœial subjects, and cannot be diverted to any other purpose.

Thus while the U S P might be technically defined as private property, its purpose and its services are of a most decided public character.

The standing of the U S P among pharmacopœias of the world is indicated by the fact that it has been translated into the Chinese language and is used as the official standard of the Republic of China. The Spanish translation has been adopted as the official pharmacopœia of the governments of the Philippine Islands and of the Island of Porto Rico, and is officially recognized by the independent Republics of Cuba and Costa Rica. The Spanish edition also has a wide distribution throughout the other Spanish-speaking nations of the Western Hemisphere.

SHOULD THE PHARMACOPŒIA BE DELETED FROM THE FEDERAL FOOD AND DRUGS ACT?

Some of those who have been confused by the alleged private property status of the United States Pharmacopœia, and also by the controversy over the inclusion or non-inclusion of a so-called variation clause, have somewhat hastily reached the conclusion that the Pharmacopœia should be deleted entirely from the Federal Food and Drugs Act, which would lead to the rather strange result that only official drugs and medicines would then be exempt from the requirements of the Federal law. Under such a situation all other drugs and medicines, including patent medicines, would be required to conform to certain standards of purity, quality and strength, and to be truthfully labeled and advertised, while official drugs and medicines could be adulterated, to any extent, and still be admissible to interstate commerce without let or hinderance from either Federal or other authority.

Legally the crime of adulteration exists when the qualities of a substance differ from those of a recognized standard. If there is no recognized standard then there is no ground upon which a charge of adulteration can be legally sustained.

Surely those who have advocated that reference to the Pharmacopœia be omitted from the Federal Act have not fully considered all the consequences of such deletion.

SHOULD REFERENCE TO THE U S P IN THE FEDERAL FOOD AND DRUGS ACT BE COUPLED WITH A VARIATION CLAUSE?

Another conclusion stoutly defended by some students of the subject is that the U S P (along with the other named authorities) should be included in the Federal Food and Drugs Act, but should not be coupled with a variation clause.

(By a "variation clause" we understand any clause or provision in the law which permits variation from the otherwise prescribed standards upon condition that the products are so labeled as to prevent their confusion with those which profess to comply with such standards.)

Those who contend that no variation from pharmacopœial standards should be permitted under any circumstances exclaim, with apparent logic, "What is the use of having a legal standard, if compliance with it is purely voluntary, and if manufacturers and dealers may follow some other standard by merely stating that fact upon the label?"

The writer agrees with the thought implied in this question in so far as it applies to drugs dispensed upon physicians' prescriptions or which are sold under their official titles for medicinal purposes, but as will be seen on further study, there are numerous cases where the practical necessities of interstate commerce, as well as other considerations, require that departure from official standards be permitted under certain circumstances, provided no deception is attempted or accomplished, and provided also that the facts are truly and clearly stated upon the label.

In the first place it should be remembered that a Federal Food and Drugs Act is based upon the constitutional powers of Congress to regulate interstate commerce and, therefore, applies exclusively to foods and drugs while they are the subjects of interstate commerce. Before they enter into or after they have left the domain of interstate traffic, the regulation of their further distribution rests solely with the police powers of the states in which they are located. Except in places under exclusive Federal jurisdiction, as the District of Columbia, any Federal law regulating the distribution of untaxed drugs, on prescription or otherwise, after they have left the domain of interstate commerce, would be null and void, and of no more legal effect than the utterance of any private citizen.

The first part of the definition for drugs as it appears in the Copeland Bill¹ [S 5, Sect 201, paragraph (b)] reads as follows: "*(1) All substances and preparations recognized in the United States Pharmacopœia, Homeopathic Pharmacopœia of the United States, or National Formulary, or any supplement to any of them.*" It will be noted that this definition does not apply merely to substances and preparations intended for medicinal use, but to every substance and preparation bearing a name

¹ The following discussion is based upon the Copeland Bill which with or without further modification will probably soon supersede the Act of June 30, 1906.

mentioned in any one of the three stated official compendiums, or in any supplement thereto, whether intended for medicinal or other purposes

Again one of the definitions of an adulterated drug, Sect 401, paragraph (b), provides that a drug shall be deemed to be adulterated "*If its name is recognized in an official compendium¹ [i. e., U S Pharmacopœia, Homeopathic Pharmacopœia or National Formulary], or if it purports to be a drug the name of which is so recognized and it differs from the standard of strength, quality or purity as determined by the tests or methods of assay set down therein,*" etc

And finally, under the provisions for misbranding [Sect 402, paragraph (h)] it is declared that a drug shall be deemed to be misbranded, "*if its name is recognized in an official compendium, or if it purports to be a drug the name of which is so recognized and it is not packaged and labeled as prescribed therein, unless exempted under (1) of this Section*"

From these definitions it seems clear that unless a variation clause be included in the Federal Act it will be unlawful to ship in interstate commerce any drug named in the U S P unless it fully complies with standards of strength, quality and purity, and the methods of labeling and packaging prescribed therein

It is true that a prefatory notice in the U S P specifically states that its standards "*are intended to apply solely to substances which are used for medicinal purposes and when professedly bought, sold or dispensed as such,*" but this limitation is nullified by the language of the Bill, which makes "all substances and preparations recognized in the U S P" subject to the requirements of the Act

Now it happens that one hundred and forty or more of the substances named in the Monographs and List of Reagents of U S P X are the names of agents, many of them belonging to the class commonly known as heavy chemicals, which are more largely employed in the arts and industries than for medicinal purposes

Among such chemicals we readily call to mind hydrochloric, nitric, sulphuric, acetic and phosphoric acids, the salts of iron, copper, zinc and manganese, the fixed alkali hydroxides, many salts of the alkalies and alkaline earths and numerous other agents, the uses of which in the arts and industries far exceed their employment for medicinal purposes. While a few hundreds or a few thousands of pounds of some of these agents would satisfy the strictly medicinal requirements of the United States, their employment in dye and paint manufacture, in metallurgy, in the manufacture of soaps, paper, fertilizers, textiles, leather, insecticides, fungicides and in the production of numerous other largely used commodities amounts to many thousands or even hundreds of thousands of tons in a single year. To require that these vast quantities of chemical should always meet the high standards of quality, strength and purity prescribed for them when employed medically would be prohibitive of their commercial and industrial uses. To make the U S P the standard for drugs in the arts and industries would be to thrust upon it a duty which it is entirely unfitted to discharge, and which it expressly disclaims in its prefatory notes

Putting aside the opinions of lawyers and appealing to our own common sense, is it conceivable that the United States Congress would knowingly adopt or

¹ By definition, Sect 201 paragraph (m) "official compendium" is understood to refer to any one of the three United States Pharmacopœia Homeopathic Pharmacopœia or National Formulary

that the Federal Courts would sustain the validity of such a rigid and unreasonable requirement?

From these considerations it seems clear that the necessities of commerce practically compel the insertion of a provision in the law which will permit the interstate transportation of drugs of other than pharmacopœial quality when labeled so as to indicate their true character

VARIATION CLAUSE NECESSARY TO PERMIT IMPROVEMENT IN PHARMACEUTICAL SUBSTANCES

Another reason for the presence of a variation clause is that it is necessary in order to permit improvement in official drugs and preparations in the interim between decennial revisions of the U S P and between the issuance of supplements thereto

That the qualities prescribed for U S P drugs and preparations are not beyond improvement is shown by the fact that the specifications for many of them are altered with each succeeding revision of that volume—changes in the percentage of active constituents, in solvents and menstrua, in solubility, melting and boiling points and other physical constants, in the purity rubric, in methods of packaging, etc., etc. The necessities for these changes are not discovered all at once on the eve of a new issue of the Pharmacopœia, but come to light from time to time during the entire decade within which a given issue is in effect

Unless the law provides some proper form of variation clause no improved product could be transported in interstate commerce until a new issue of the Pharmacopœia, or of a supplement, recognized such change. The improvement might be of the highest importance to human health and life, yet the producer could not ship his product across state lines by mail, express or freight, or carry it in person—even with the most elaborate precautions of labeling to show that the preparation did not purport to comply with Pharmacopœial standards, and specifically designating the particulars in which it differed therefrom

His only recourse would be to market it as a proprietary specialty, under a coined name, which he would be perfectly free to do, and thus the absence of a proper variation clause would act as a direct encouragement to the further multiplication of a variety of preparations of which we already have too great a surplus

VARIATION CLAUSE IN RELATION TO THE DELEGATION OF LEGISLATIVE POWER

The presence of a variation clause in the Food and Drugs Act is also closely tied up with the judicial doctrine that legislative bodies cannot delegate to others the legislative powers vested in them by a written constitution

The United States Constitution (Article I, Sect. 1) recites that "*All legislative powers herein granted shall be vested in a Congress of the United States, which shall consist of a Senate and House of Representatives*"

By an unbroken line of judicial decisions it has been settled that the intent and effect of this Article is to prevent the Congress from transferring any of its law-making powers to any other body, public or private, or to any administrative officer or other individual. Recent decisions in the code cases have re-affirmed and emphasized this interpretation of the Constitution, and have declared that the Congress cannot confer even upon the President of the United States the power to

designate and define acts which shall be regarded as criminal, and for which citizens may be punished by fine or other penalties

The inclusion in the Food and Drugs Act of an issue of the U S P in existence at the time the law is enacted would be distinctly an Act of the Congress itself, as much so as if the language of the U S P had been copied in the Bill, and could not, therefore, be regarded as a delegation of legislative power, but how about later editions of the book, creating new standards, and coming into effect after the law has been placed on the statute books?

By the terms of the Act [Sect 201, paragraph (m)], the particular issue of the Pharmacopœia which shall apply in determining the charge of adulteration or misbranding is the one which shall be "*official at the time any drug * * * * is introduced into interstate commerce*"

It may happen, therefore, that a drug which fully complied with the Pharmacopœia official at the time the law was enacted will not comply with the standards of a later edition of that volume. Would the shipment of such a drug be punishable as a crime under the Food and Drugs Act? If so, it would not be a crime created by the direct act of Congress, but by the action of the U S P Revision Committee in changing the standards after the enactment of the law

This was the particular question considered in "*The State of Ohio vs Emery,*" reported in 54 Ohio State Report, page 365, which may be regarded as the leading case on this subject

The Ohio statute, enacted in 1890, while the 1880 Revision of the U S P was still in effect, declared a drug to be adulterated "*(1) If sold under or by a name recognized in the United States Pharmacopœia it differs from the standard of strength, quality or purity laid down therein*" The statute did not contain a clause permitting variations from the standards of the Pharmacopœia if properly labeled so as to show such variation

Subsequent to the enactment of the statute the 1890 Revision of the Pharmacopœia became official, and by a regulation of the Ohio Food and Dairy Commissioner was adopted as the standard of his Department, and in Oct 1895 the defendant Emery was arrested for the sale of adulterated cochineal

On trial of the case it appeared that the cochineal did conform to the standards of the 1880 Pharmacopœia—the issue official at the time the law was enacted—but did not conform to the standards of the 1890 Revision

Attorneys for the State contended that under his authority to make rules and regulations for the administration of the Act the State Food and Dairy Commissioner had authority to substitute the standards of the new Pharmacopœia in place of the standards of the 1880 Revision

Counsel for the defendant contended that the legislature could not adopt as part of the penal laws of the State the contents of a book not then in existence, and that it could not confer upon the Food and Dairy Commissioner authority to designate a different standard than that adopted by the legislature, since to do so would be an unconstitutional delegation of the law-making power

The Supreme Court of the State of Ohio sustained the contention of the defendant's counsel in the following language

The reference in the statute to the United States Pharmacopœia, could be to no other than the edition of the book in use and recognized when the statute was enacted and went into ef

fect, which was the edition known as that of 1880. It is not to be supposed that the legislature intended to adopt by reference, as part of the penal laws of the State, an edition of the book not then in existence, and of the contents of which the legislature could have no knowledge. The drug with the sale of which the accused was charged was recognized in the edition of 1880, by the name under which it was sold, and a standard of strength, quality and purity therein laid down. It is not claimed the drug sold was below that standard, and the sale could not be rendered unlawful because it is below a higher standard laid down in a subsequently revised edition of the book, though that edition was in use at the time of the sale. To hold that the sale could thus be made unlawful would be equivalent to holding that the revisers of the book could create and define the offense, a power which belongs to the legislative body, and cannot be delegated."

It will be noted that this decision sustains the power of the legislature to adopt an existing Pharmacopœia as part of the law, but denies its power to authorize the substitution of a later issue for the one in force when the law was adopted.

Although rendered in the construction of a state enactment, the rule laid down in the Emery case has been generally regarded as equally applicable to Federal laws, and this decision was really responsible for the insertion of the variation clause in the Federal Food and Drugs Act of June 30, 1906.

The theory upon which it is argued that the insertion of a variation clause will save the statute from the charge of being an unconstitutional delegation of power is that it will permit the manufacturer to freely select the standard which he chooses to follow, provided his labels indicate the facts truthfully and clearly. In plain English it gives the manufacturer the option either of following the standards of the U S P or other standards as he may prefer, provided that if he elects to follow some other standard the label shall plainly indicate the fact. Thus the manufacturer's liability and obligations always remain the same no matter how frequently the standards of the Pharmacopœia are altered.

If the manufacturer is always free to choose the standards with which his preparations shall comply, then no change in the Pharmacopœia can affect his property rights or legal obligations, and consequently there is no exercise of law-making power when the Revision Committee changes the standards of the Pharmacopœia.

TITLES USED IN U S P TAKEN FROM COMMON LANGUAGE

Another thought to be taken into consideration is that the titles employed to designate U S P chemicals and preparations are, in a majority of cases, taken directly from the English language, and do not represent any invention or discovery on the part of the revisers of that volume.

If one were to seek a copyright upon such titles as Tincture of Aconite or Hydrochloric Acid the application would be refused upon the ground that these are common words of the English language, the use of which is free to all, and that they may not be monopolized so as to represent exclusively the product of a single individual. If these titles cannot be monopolized to distinguish the products of a particular manufacturer, upon what ground can it be argued that their incorporation in the U S P confers upon them such special qualities that they can no longer be used in their ordinary English sense, especially when coupled with other qualifying words which plainly indicate that the products to which they are attached do not profess to comply with U S P requirements.

To hold that when common nouns and adjectives are once incorporated in the U S P they can—in the absence of deception—no longer be employed in their

original and ordinary senses, would be to establish a rule of law never before recognized in this or any other country

PRIMARY PURPOSE OF FOOD AND DRUGS ACT TO PREVENT FRAUD AND DECEPTION

The primary and fundamental purpose of a food and drugs act is not to compel the use of certain products in preference to others, but to prevent fraud and deception in the sale of such substances—to prevent the sale of adulterated or harmful foods as pure and wholesome, or the delivery of adulterated or sophisticated drugs in place of those which are pure and genuine, or as in the case of cosmetics or package medicines, to insure that they shall not contain harmful or dangerous ingredients. It seeks to accomplish these results by requiring that labels and advertising shall state necessary and material facts, and shall not bear false and misleading statements, that inferiority shall not be concealed by the use of color or other artifice, or that the form of package shall not be such as to mislead the purchaser as to the quantity of its contents. In short, it aims to provide the means whereby the purchaser, from an inspection of the package, the label or the advertising, can determine whether the product possesses the qualities he seeks, and to insure that he shall receive what he expects and pays for. If the package, the label and the advertising clearly and truthfully set forth the character of the product the primary purpose of the law is accomplished.

SUMMARY

In the preceding pages it has been sought to justify the following conclusions

1 That a Federal Food and Drugs Act as represented by the Copeland Bill, applies exclusively to foods and drugs while they are within the domain of interstate commerce. By the use of no language can the Federal law be made to apply to commerce after it has lost its interstate character. After once mingling with the goods of a particular state, only the laws of such state can fix the qualities which drugs must possess in order to permit their lawful distribution therein.

2 That the definitions for drugs, and for adulterated and misbranded drugs as found in the Copeland Bill are such that without the addition of a proper variation clause, only such drugs as complied with U. S. P. standards of strength, quality and purity could be lawfully transported in interstate commerce, a condition which if it prevailed would prevent the shipment of hundreds of thousands of tons of drugs and chemicals commonly used in the arts and industries.

3 That each new revision of the U. S. P. presents numerous changes in the standards of strength, quality and purity of the drugs described in its monographs, and also introduces new drugs and preparations which were not commonly used or even known when the preceding volume was issued. If the law-making body confers upon the revisers of the Pharmacopœia blanket authority to change the legal obligations of the citizen so as to render him liable to fine and imprisonment for acts which would have been innocent in law if the Pharmacopœia had not been revised, it would seem fairly evident that there has been an attempted delegation of law-making power.

On the other hand, if the law permits the use of U. S. P. titles which are parts of common English speech, upon articles not of U. S. P. standards, upon condition merely that the label states the fact of such variation, then no new obligation is

forced upon the producer when a new Pharmacopœia becomes official Under any revision of the Pharmacopœia his legal liability remains the same, he will always have the option either of observing U S P standards or of stating upon the labels wherein his product differs from such standards

4 That it is the common understanding among physicians and pharmacists and taught in all colleges of pharmacy, that the use of a U S P title without the addition of qualifying adjectives or other explanatory words, implies that the product to which it is attached complies with U S P standards of strength, quality and purity Unless this be the rule, the primary purpose of the Pharmacopœia—to enforce uniformity in properties and potency—would be defeated

5 That a proper variation clause is one which would require that when a U S P title is attached to a drug of other than U S P standards the qualifying words shall indicate clearly that the drug does not profess to comply with such official standards The wording of the label should not be obscure or ambiguous, but such as to enable the reader to form an intelligent opinion as to the character of the product

6 And finally, that the deletion of the variation clause from the Federal Food and Drugs Act would not close interstate commerce to the shipment of medicinal preparations of official drugs which did not comply with U S P standards The producer would need only to give his product some attractive coined name and ship it as a proprietary specialty, thus setting his own standards, without let or hunderance from any authority

A BRIEF HISTORY OF THE DRUG CODE *

BY E F KELLY

Following the enactment of the National Industrial Recovery Act, the National Association of Retail Druggists appointed a Committee on the Retail Drug Code

Later, a meeting of representatives of the state pharmaceutical associations was held in St Louis, Mo, at the invitation of Drug Center, at which a Committee was named to cooperate with the N A R D Committee in preparing a code for the retail drug trade

These Committees met jointly in Washington, D C, and drew up a code which was sponsored by the N A R D with the approval of the AMERICAN PHARMACEUTICAL ASSOCIATION Representatives of the Drug Institute of America, Inc, also coöperated in writing the Code It was estimated that at least 60% of the retail drug trade of the Country sponsored the code

The original hearing on the Code of Fair Competition for the Retail Drug Trade was held in the auditorium of the Chamber of Commerce of the U S A, Washington, D C, on August 25, 26 and 27, 1933, before A D Whiteside as Deputy Administrator, and Donald Richberg as Legal Advisor It became evident at the first session of the hearing that the Code as submitted would have to be amended and the remainder of the sessions were devoted to an effort to bring about

* Section on Historical Pharmacy, Portland meeting 1935

an agreement between the views of the National Recovery Administration and the representatives of the trade. Finally, a compromise was reached and an amended code was substituted. This code was the subject of a number of private hearings and conferences, and was finally approved by President Roosevelt on October 21, 1933, as a part of the Code of Fair Competition for the Retail Trade with Schedule A applicable to the retail drug trade. A copy of the code with explanations is attached, and it will be noted that drug retailers were subject to the same provisions as the other retailers subject to the code except as amended or supplemented by Schedule A.

Schedule A provided for the administration of the Code as far as the drug trade was concerned, by the National Retail Drug Trade Council composed of two members representing the National Association of Retail Druggists, one member representing the AMERICAN PHARMACEUTICAL ASSOCIATION and one member representing the Drug Institute of America, Inc.—the members to be approved by the NRA.

The Council was approved on October 27, 1933, with the following temporary membership: John A. Goode and John W. Dargavel, representing the National Association of Retail Druggists; E. F. Kelly, representing the AMERICAN PHARMACEUTICAL ASSOCIATION, and Wheeler Sammons, representing the Drug Institute. In November 1933, George M. Gales was added as the representative of the National Association of Chain Stores with the Approval of NRA. Later, each of these gentlemen was elected to membership with the exception of E. F. Kelly, representing the A. P. H. A. who served as a temporary representative, since a meeting of this ASSOCIATION was not held in the interval between the time when permanent representatives were requested and the closing of the code organization. At the organization meeting, J. A. Goode was elected *Chairman*, and E. F. Kelly, *Secretary-Treasurer*, of the Council and they served continuously as did each member, throughout the existence of the code. W. H. Johnson was elected *Assistant Secretary* in charge of the office and resigned on April 1, 1934, when he was succeeded by Paul Pearson. E. F. Kelly served as *Executive Secretary* from June 1934 to March 15, 1935, when he was succeeded by W. S. Elkins, Jr.

The name of the Council was changed to the National Retail Drug Code Authority in December 1933. The office was located in the Tower Building, 14th and K Sts., N. W., until May 1, 1934, after which date it was located in the National Press Building, 14th and F Sts., N. W., Washington, D. C.

The Code became effective on October 30, 1933, and, after organizing, the Council undertook the organization of local code authorities. It was recommended that these be set up in each congressional district, except in those cases where two or more congressional districts were included in a city, when the districts were to be combined and a metropolitan code authority composed of representatives of the districts included, was to be organized. The president of each state pharmaceutical association was requested to name three representative druggists in each congressional district to conduct the election of the local or metropolitan code authority. This procedure was unique and proved to be very successful since approximately 420 out of a possible 435 congressional districts were organized and in operation within a short time.

Raising the necessary funds also had prompt attention. A voluntary assess

ment of one dollar per employee was levied for the year ending October 31, 1934, payable to the local or metropolitan code authority of which one dollar per store was to be remitted to the national code authority for its expenses. The remainder was intended for the expenses of the local or metropolitan code authority whose treasurer was bonded, under a budget approved by NRA and subject to audit. The single assessment plan was adopted whereby the retailer paid only to the code authority representing his principal line of business.

The budget submitted in October 1934, and approved in November 1934, covered the six-month period from November 1, 1934 to April 30, 1935, and called for a mandatory assessment of one dollar per employee payable to the local or metropolitan code authority of which fifty cents per store was to be remitted to the National code authority. This was a combined budget and covered \$25,000.00 for the national code authority and \$173,979.05 for the local and metropolitan code authorities.

The National Code Authority adopted a Constitution and By-Laws, which were approved by NRA.

During the life of the code, the following amendments to Schedule A were approved after public hearings:

Amendment No. 2 established a new Loss Limitation clause effective April 7, 1934 making it a violation to sell below the manufacturers' wholesale list price in dozens, provided that all discounts, free goods and allowances made available to all purchasers in dozens be taken into account. The proviso made it necessary for the national code authority to issue lists giving approved minimum prices which proved to be unworkable because of the large number of items affected and because of the frequent changes in prices.

Amendment No. 6—A new Loss Limitation clause was approved, effective September 8, 1934, qualifying Amendment No. 2 by removing the unworkable proviso and giving the Administrator the right to suspend or modify the clause in respect to all articles, the price of which the manufacturer was found to be manipulating unfairly.

Amendment No. 7 provided for mandatory assessments.

Amendment No. 9 provided for the incorporation of the national or local or metropolitan code authorities. The national code authority was not incorporated.

A number of interpretations and administrative orders affecting the drug code were issued by NRA but time will not permit a discussion of them.

Although the Code Authority recognized the need for and the fairness of a reasonable labor mark-up, it realized the necessity of establishing a sound cost definition first as a basis. A request for a labor mark-up was filed in November 1933, and a mass of information in support of such a mark-up was submitted.

The Code Authority has been represented at many conferences and on several committees. The more important were the code meetings in March 1934, when several thousand of the most representative business men of the country were called to Washington to consider the entire question of regulation by codes. As a result, three committees were appointed to study the whole situation and submit recommendations and opinions to the Administrator. These committees were on (1) Capital Goods, (2) Consumer Goods, (3) Retail and Service Trades. Our Code Authority was represented on the second and third of these committees and the needs of the retail druggists were strongly presented.

Many troublesome questions and conflicts between the provisions of the several retail codes have arisen and have required much time and effort. Among

these may be mentioned soaps, medicinal foods, soft drinks, tobaccos, candies, drug sundries of various types, and many other products which are sold by various classes of retailers. These developments have led to closer relations and cooperation between the various retail code authorities. As an illustration, may be mentioned the general agreement for a single assessment under that code representing the principal business of the retailer. This agreement did away with the very troublesome multiple assessment. A strong effort was made to secure a reasonable plan for distributing the Blue Eagles and labor posters, making these easily available to the retail druggists.

It is impossible to enumerate every activity of the Code Authority or to more than indicate the time and effort that has been required. Those acquainted with Governmental procedure, and especially in a new and vast activity, can fully understand the situation.

The Code Authority held regular monthly meetings and many special meetings. Some meetings continued over several days. The correspondence with local code authorities, with individuals and with governmental officials and agencies has been very extensive. The expenses were heavy but the Code Authority operated well within its budget.

No one realizes more clearly than the members of the Code Authority and their associates the disappointments that followed the code efforts, and the apparent inability of those directing NRA to reach decisions and to maintain policies was discouraging. The frequent change in personnel in the NRA greatly interfered with the work and it was difficult to impress upon NRA that the retail drug industry has peculiar duties and processes of its own.

However, the effort and expense are believed to have been justified when the dangers that were avoided and the progress that was made are given full consideration. It has been a fine illustration of the benefits of organization, of the value of ethics and fair play in business, of the fact that a sound system of distribution is to the interest of consumer as well as of distributor, and that a fair price is not necessarily a higher price to the consumer.

With the decision of the Supreme Court in the Schechter case, it was necessary to promptly liquidate the affairs of the national, local and metropolitan code authorities. The national code authority liquidated, with legal advice, by completing its records, by paying its bills, and all expenses in the orderly closing of its affairs. As the national code authority had operated on a small balance, no dispersion of balance was necessary.

It was ordered at the final meeting held on June 8, 1935, that the records of the National Code Authority should be placed in the keeping of the secretary for one year and then turned over to the AMERICAN INSTITUTE OF PHARMACY for such historical use as can be made of them. In this way, the history of this very important social and economic experiment will be preserved and later it is hoped that it may be written up more completely.

THE BADIANUS MANUSCRIPT, AN AZTEC PHARMACOPŒIA *

BY EMILY WALCOTT EMMART ¹

We are so accustomed to think of the introduction of Spanish culture into Latin America during the 16th century that the reciprocal transmission of Aztec learning into Europe has long been a neglected subject. In but one branch of learning, the field of medicine, Mexico has left her stamp upon the pages of European history. Among the works of the great herbalists, Carlos Clusius, Gaspard Bauhin, Colonna, Monardes, Hernandez, Gerard, Parkinson, and others of the 16th and 17th centuries, we find many references to Aztec medical practices. Of these only the volumes of Hernandez and Monardes were devoted entirely to the medical practices of Latin America. These, however, presented native medicine as seen through the eyes of Europeans. Only one Aztec written medical text has thus far come down to us. For the sake of brevity this manuscript has been referred to as the Badianus Manuscript.^{2,3} This beautiful little manuscript holds the unique position of being the earliest herbal and pharmacopœia written on this side of the Atlantic and contains the earliest illustrations of some 204 plants and trees of Mexico, together with a list of ailments and diseases and the mode of treatment. The original text is the possession of the Vatican Library where its identity has been obscured by the title "Codex Barberini, Latin 241." The precise title of the manuscript is "A book of Indian Medical Herbs composed by a certain Indian physician of the College of Santa Cruz, who is not theoretically learned, but is taught only by experience. In the year of our Lord Saviour 1552." Plate I.

Until approximately six years ago the codex was unknown to the world at large. At that time it was discovered independently and almost simultaneously by Dr. Lynn Thorndike and Dr. Charles U. Clark. Dr. Clark brought back to the Smithsonian Institution a photographic copy and it has been from photostats of this that the present study and translation has been made.

The Badianus Manuscript is the work of two Indians who had been educated in the College of Santa Cruz, Mexico City. The text was originally written in Aztec by Martinus de la Cruz whose name appears in the dedication. From the postscript we learn that within the same year the work was partially translated into Latin, July 22, 1552, by one, Juan Badianus, a native of the district of Xuchimilco and reader in the College of Santa Cruz. Plate II. The manuscript is fittingly dedicated to Francisco de Mendoza and to his father, Antonio de Mendoza, first "Viceroy of this India" who according to the historian Mendieta, founded the college with his own funds. From the dedication also we learn that the book was intended as a gift to his "Holy Cæsarian Royal Catholic Majesty"—Charles V.

The manuscript is a complete book possessing a table of contents and is divided into thirteen chapters. As in some of the European herbals, there is an attempt to group ailments according to the region in the body, beginning with the

* Section on Historical Pharmacy. A. P. H. A., Portland meeting 1935.

¹ The Johns Hopkins University.

- Emmart, E. W.—1935. Concerning the Badianus Manuscript, an Aztec Herbal, "Codex Barberini, Latin 241" (Vatican Library). Smithsonian Miscellaneous Collections, Vol. 94, No. 2, May 18, 1935.

³ Emmart, E. W.—1935, "An Aztec Medical Treatise. The Badianus Manuscript." Bulletin of the Institute of the History of Medicine, Vol. 3, No. 6, June 1935.

head and proceeding to the feet In several chapters, however, this arrangement is vague The plants which are in brilliant colors¹ are usually arranged at the top of the page above the description of the usage Since the translation was made with the use of Pliny no equivalents could be found for the Aztec plant names so that these have remained unchanged along with the names of numerous stones and animals There are in fact some 313 Aztec words in the manuscript, many of which do not appear in any dictionary A complete analysis of the etymology of these words has been made and this has been of great assistance in identifying the plants botanically Aztec nouns, as in German, are built upon descriptive roots so that the analysis of the word may relate to the color of the flower or its location or perhaps to some characteristic of the plant itself such as spiney, small, large, climbing or creeping, etc

Not infrequently Aztec symbols are incorporated in the illustrations For example, a small tree called Couaxocotl² is depicted as having two serpents climbing up in the tree toward the fruit The word couaxocotl literally means serpent-fruit since coua is derived from coatl-serpent (Sim 101)³ and xocotl is the Aztec word for fruit (Sim 705) Ants are sometimes shown climbing up the stem of plants possessing nectaries or clambering over the roots of others which grow near ant hills The Aztec water symbol is frequently drawn under the roots of plants growing near running water

Among the many interesting remedies there are treatments for mange, scabs, falling hair, cataract, tumor of the eyes, cold in the head, quinsy, fever, fatigue, for helminth infections, dysentary, hemorrhoids, medicine to produce lactation and numerous other remedies The last chapter ends very fittingly with "certain signs of approaching death" Usually a page is given over to a single treatment with the principal plants illustrated at the top of the page For example, above the remedy for warts is found the plant Tzotzocaxihuitl or wart-plant (tzotzocatl-wart, Sim 670 and xihuitl-plant, Sim 699) Under the picture of the plant one reads

WART

"A warty person is healed if you apply to the warts the leaves of *helioscopium* (wartwort) ground in water, so that the warts will become putrescent and so may be lifted off It will be helpful also to rub the warts with water in which a human body has been washed" Plate III, Badianus Manuscript, page 96

For tubercles on the breast we read as follows

"The juice of ground cedar leaves and cones, of the leaves and root of *Quauhyauhtli* (wild-incense), of the herbs *Elocacatl* (maize flower), the rush, *Pocahucaliz-xuhtonli* (rare-little-plant) and *Totecyxuuh* (Herb of Totec, God of the Goldsmiths), stops a tumor growing on the breasts, if the swelling breasts be smeared with it" Plate IV, Badianus Manuscript, page 110

Many of the remedies include ingredients which have long been of medical

¹ Through the kindness of Dr Charles G Abbot of the Smithsonian Institution, colored sketches of these plants have been obtained and it is hoped that the necessary funds will some day be obtained for a complete facsimile reproduction in color with introduction and foot-notes complete

² Emmart, E W, 'An Aztec Medical Treatise The Badianus Manuscript,' Bull of the Institute of the History of Medicine, Vol 3 No 6, June 1935, page 498, Pl 5

³ Simeon Remi Dictionnaire de la Langue Nahuatl (Paris, Imprimerie Nationale, 1885)

usage Among them salt solution, a form of soil containing a large quantity of soda, onions and honey water, oil of indigo, egg white or yolk, charcoal etc Numerous unguents were used as well as plasters with a base of feathers or hair or rubber The bezoar stone, especially that from roosters, was of frequent usage Numerous stones and variously colored earths and native wines were frequently mixed with the juices of plants and frequently parts of animals Probably the earliest record in America of the use of *Datura* as a narcotic is to be found here, also the use of vanilla plant and the cocoa

That the knowledge of medical plants and treatments of disease was considered equal to if not superior to that of Europe is indicated by the fact that the early Franciscan friars included Mexican medicine in the curriculum of the College of Santa Cruz Even more significant is the fact that Philip II sent Dr Francisco Hernandez, under the title of Protomedico of Spain to New Spain with orders to travel throughout Mexico and collect data on native plants and their usage History records the fact that after the trade routes were established between the New World and Europe, roots, bark and herbs were shipped to Europe in large quantities The spreading of Aztec medical knowledge to Europe was accomplished by the writings of Friar Bernardino de Sahagun, Dr Francisco Hernandez and Dr Nicholas Monardes, and by the tales of ship captain, travelers and merchants A careful cross-referencing of the present herbal with other sixteenth century writers of Latin American botanical texts shows but little relationship except with that of Sahagun This would be expected since he resided at Tlaltemolco during a large part of his life in Mexico, and may have been at one time the teacher of Aztec and Latin to both Martinus de la Cruz and Juan Badianus

THE PHARMACIST AND THE PODIATRIST *

BY W F AMBROZ ¹

Heretofore, we as pharmacists have been detailing the doctors, the dentists, the veterinarians, the oculists, and all the while passing up the podiatrists In this field yet untouched or merely scratched, pharmacists have an opportunity to practice the principles they have learned in manufacturing and dispensing pharmacy Why not apply that knowledge and technique and in return establish a practice that will compensate for the time spent?

The podiatrist or chiropodist belongs to that branch of public health service, the same as the doctor, dentist or nurse Some practicing physicians now refer cases to the podiatrist for treatment Pharmacists, therefore, have another channel to work in a well-established and recognized field

Each state has its own rules and regulations dealing with the podiatrist Their state boards usually consist of two members of the medical state board and two practicing podiatrists They have their code of ethics or trade laws which are similar to those of the medical profession governing their practice In most states they are allowed to write prescriptions for external application Podiatry schools

* Section on Education and Legislation Portland meeting 1935

¹ Indianapolis College of Pharmacy

and colleges have three-year courses which are required by most states for state examinations. These courses envelop all phases of study that deal with foot ailment such as Anatomy, Physiology, Chemistry, Materia Medica, Pathology, Bacteriology, Surgery, Dermatology, Principles of Medicine, Diagnosis, Neurology, X-ray Therapy, Shoe Therapy, Ethics, Medical Jurisprudence, etc.

It is evident that the podiatrist is well trained in the art of caring for the feet, and can prescribe medicines to be used by his patient or will apply many of them himself. He will prescribe local applications, and it is in that connection the pharmacist should take notice.

Various coloring agents should be used with the preparations as well as essential oils for perfumes. Through the advice of the podiatrist the same preparations may be compounded by using different coloring agents and odors. The labels used on the prescriptions should bear the podiatrist's name and the name of the pharmacy.

This field is now being supplied with many proprietaries, the pharmacist can acquaint the podiatrist with many official formulas and probably some original ones which he can compound more economically to the purchaser and with greater profit for himself.

The preparations listed are limited, yet indicate a few materials the podiatrist uses. They can be compounded by pharmacists, and dispensed on prescription or otherwise.

A—DUSTING POWDERS

1	Antiseptic Powder	N F
2	Compound Powder of Talc	N F
3	Phenol	1 0 Gm
	Camphor	3 0 Gm
	Exsiccated Alum	96 0 Gm
4	Salicylic Acid	4 0 Gm
	Boric Acid	5 0 Gm
	Starch	16 0 Gm
	Purified Talc	60 0 Gm
5	Salicylic Acid	10 0 Gm
	Bismuth Subnitrate	15 0 Gm
	Zinc Stearate	10 0 Gm
	<i>To be used for Bromidrosis</i>	
6	Salicylic Acid	2 0 Gm
	Tannoform	13 0 Gm
	Talcum	15 0 Gm
	<i>To be used for Hyperhidrosis</i>	
7	Salicylic Acid	2 0 Gm
	Tannic Acid	5 0 Gm
	Orris Root	33 0 Gm
	Alum	60 0 Gm
8	Bismuth Subgallate	
	Boric Acid	aa 15 0 Gm
9	Bismuth Subnitrate	20 0 Gm
	Starch	10 0 Gm
	Purified Talc	70 0 Gm
10	Mercuric Chloride	0 06 Gm
	Sodium Salicylate	26 0 Gm
	Prepared Chalk	4 0 Gm

11	Zinc Oxide	15 0 Gm
	Boric Acid	30 0 Gm
	Purified Talc	45 0 Gm
12	Thymol Iodide	8 0 Gm
	Zinc Oxide	4 0 Gm
	Lycopodium	48 0 Gm
13	Salol	2 5 Gm
	Purified Talc	97 5 Gm

B—EMOLLIENTS

These substances and preparations are dispensed in ointment, mixture or solution form for the purpose of soothing

1	Cacao Butter	U S P
2	Camphor Liniment	U S P
3	Ointment of Rose Water	U S P
4	Carron Oil	U S P
5	Camphor Ointment	N F
6	Ointment of Zinc Stearate	N F
7	Calamine Lotion	N F
8	Compound Calamine Lotion	N F
9	Glycerin	
	Rose Water—equal parts	
10	Tragacanth	0 5 Gm
	Boric Acid	1 5 Gm
	Glycerin	1 5 cc
	Water q s	100 0 cc
11	Balsam of Peru	25 0 Gm
	Sulphonated Bitumen	25 0 Gm

	Wool Fat	50 0 Gm
	Petrolatum	50 0 Gm
12	Phenol	2 0 Gm
	Menthol	6 0 Gm
	Petrolatum	60 0 Gm
	Wool Fat	32 0 Gm
13	Lead Oleate Plaster	48 0 Gm
	Olive Oil	8 0 Gm
	Boric Acid	6 0 Gm
	Tannic Acid	2 0 Gm
	Petrolatum	36 0 Gm

C—MASSAGE PREPARATIONS

These substances are dispensed in ointment, mixture or solution form, and applied before or after treatment, usually with a vibrator

1	Witch Hazel Water	N F
2	Rubbing Alcohol	
3	Menthol	2 5 Gm
	Tragacanth	4 0 Gm
	Glycerin	12 0 cc
	Alcohol	15 0 cc
	Water q s	300 0 cc
4	Gelatin	2 0 Gm
	Water	48 0 cc
	Glycerin	5 0 cc
	Glycerite of Boroglycerin	45 0 Gm
5	Vanishing Creams	
6	Fluidextract of Hamamelis	10 0 cc
	Wool Fat	60 0 Gm
	Petrolatum	30 0 Gm
7	Menthol	0 8 Gm
	Camphor	0 8 Gm
	Eucalyptol	3 0 Gm
	Petrolatum	96 0 Gm

D—KARYOLYTICS—SOFTENING OF ABNORMAL GROWTHS

Used by the podiatrist

1	Soap Liniment	U S P
2	Liniment of Soft Soap	U S P
3	2% Aqueous Phenol Solution	
4	2% Aqueous Potassium Hydroxide Solution	

E—ESCHAROTICS

Used by the podiatrist and in some cases by the patient in the removal of corns, tumors warts etc

1	Solution of Zinc Chloride	U S P
2	Nitric Acid	U S P
3	Glacial Acetic Acid	U S P
4	Trichloroacetic Acid	U S P
5	Compound Collodion of Salicylic Acid	N F

6	Saturated Solution of Salicylic Acid in Alcohol	
7	40% Aqueous Potassium Hydroxide Solution	
8	50% Aqueous Silver Nitrate Solution	
9	Saturated Aqueous Solution of Potassium Dichromate	
10	Chromic Acid—used with enough water to form a paste	
11	Copper Sulphate in Sticks, Powder or a 15% Aqueous Solution	
12	60% Salicylic Acid Ointment	
13	Trinitrophenol	1 3 Gm
	Alcohol q s	30 0 cc

F—SKIN LESIONS

(a) *Dry, Scaly, Exfoliate*

1	Ointment of Mercuric Nitrate	N F
2	Modified Whitfield's Ointment	
3	Sulphonated Bitumen	8 0 Gm
	Glycerin	16 0 Gm
	Rose Water	16 0 cc

(b) *Ulcerated and Tender*

1	Ointment of Tannic Acid	U S P
2	Calamine Lotion	N F
3	5% Aqueous Solution of Sodium Thio sulphate	
4	Saturated Aqueous Solution of Epsom Salt	
5	Borax—as a dusting powder	
6	5% Ammoniated Mercury Ointment	
7	8% Ointment of Scarlet Red	
8	Tincture of Iodine U S P—diluted one-half with glycerin	
9	5% Gentian Violet in 50% Alcohol	
10	Acriflavine Hydrochloride 5%, in 55 parts of Alcohol 10 parts of Acetone and 35 parts of Water	
11	Saturated Aqueous Solution of Boric Acid	

(c) *With Itching*

1	Dobell's Solution	N F
2	Burow's Solution	N F diluted one to ten
3	5% Ammoniated Mercury Ointment containing 1 cc of Liquefied Phenol per 100 Gm	
4	10% Salicylic Acid Ointment	
5	Borax	8 0 Gm
	Liquefied Phenol	2 0 cc
	Glycerin	2 0 cc
	Water q s	250 0 cc

(d) *Vesicular*

1	Solution of Hydrogen Peroxide	U S P
---	-------------------------------	-------

- | | | |
|---|---|-------|
| 2 | Lassar's Zinc Paste | N F |
| 3 | Tincture of Iodine | U S P |
| | Half strength | |
| 4 | Whitfield's Ointment | |
| 5 | 10% Ointment of Ammoniated Mercury containing one drachm of Sublimed Sulphur to the ounce | |
| 6 | Saturated Solution of Salicylic Acid in Alcohol | |
| 7 | 70% Alcohol | |
| 8 | 1% Phenol Solution in 9% Alcohol and Water | |
| 9 | Mercuric Chloride 1 to 1000 | |

G—PREPARATIONS USED IN THE TREATMENT OF RING WORM INFECTIONS

- | | | |
|---|---|----------|
| 1 | Tincture of Iodine U S P diluted half with Glycerin | |
| 2 | 12.5% Aqueous Solution of Sodium Thiosulphate | |
| 3 | Mercuric Chloride 1 to 250 | |
| 4 | Mercuric Chloride | 0 18 Gm |
| | Formaldehyde | 0 42 cc |
| | Acetone | 10 00 cc |
| | Spirit of Camphor | 90 00 cc |
| 5 | Bimiodide of Mercury | 0 12 Gm |
| | Tincture of Iodine <i>q s</i> | 30 00 cc |
| 6 | Ointment of Chrysarobin | 5 0 Gm |
| | Ointment of Tar | 55 0 Gm |

H—HYPERHIDROSIS AND BROMIDROSIS

Used by the podiatrist or by the patient as directed by the podiatrist

- | | | |
|---|--------------------------|-------|
| 1 | Glycerite of Tannic Acid | U S P |
|---|--------------------------|-------|

- | | | |
|---|--|----------|
| 2 | Potassium Permanganate 1 to 1500 | |
| | Immerse feet for 5 or 10 minutes once or twice a day | |
| 3 | 4% Formaldehyde | |
| 4 | 10% Aqueous Solution of Aluminum Chloride | |
| 5 | 5% Tannic Acid Solution or 10% Ointment | |
| 6 | 5% Aqueous Solution of Alum | |
| 7 | Potassium Permanganate | 0 5 Gm |
| | Thymol | 1 0 Gm |
| | Water <i>q s</i> | 480 0 cc |
| 8 | Compound Solution of Cresol | 4 0 cc |
| | Alcohol | 96 0 cc |
| 9 | Aluminum Chloride | 10 0 Gm |
| | Alcohol | 25 0 cc |
| | Water <i>q s</i> | 100 0 cc |

I—SKIN STIMULANTS

Substances used to assist in healing

- | | | |
|---|---|---------|
| 1 | Balsam of Peru | U S P |
| 2 | 3 to 5% Solution of Salicylic Acid in Alcohol | |
| 3 | Ointment of Salicylic Acid 2% in Cold Cream | |
| 4 | Strong Silver Protein | 15 0 Gm |
| | Water | 10 0 cc |
| | Hydrous Wool Fat | 15 0 Gm |
| | Petrolatum | 60 0 Gm |
| 5 | Scarlet Red | 4 0 Gm |
| | Olive Oil | 12 0 Gm |
| | Hydrous Wool Fat | 30 0 Gm |
| | Petrolatum | 54 0 Gm |

DENTAL FORMULAS

MOUTH RINSE

- | | |
|----------------------------|-----------|
| Menthol | 0 5 Gm |
| Thymol | 0 5 Gm |
| Eucalyptol | 2 5 cc |
| Methyl Salicylate | 0 6 cc |
| Alcohol | 150 0 cc |
| Distilled Water <i>q s</i> | 1000 0 cc |

This is an aromatic mouth rinse similar to Liquor Antisepticus, but without any strongly antiseptic substances. When diluted 2-3 times, it is suitable for the spray bottle.

TOPICAL ANESTHETIC

- | | |
|----------------------------------|---------|
| Ethyl Aminobenzoate (Benzocaine) | 5 00 Gm |
| Camphor | 0 25 Gm |

- | | |
|-----------------|-----------|
| Menthol | 0 25 Gm |
| Oil of Clove | 0 50 cc |
| Oil of Cinnamon | 0 50 cc |
| Alcohol to make | 100 00 cc |

A few drops applied to the gum with a medicine dropper or pipette will produce surface anesthesia within 15-20 seconds. The effects persist for 10 to 15 minutes and are devoid of any subsequent irritation. Rubbing is not necessary, neither hastening nor increasing the depth of anesthesia.

Variations in flavors, such as using oils of Spearmint, Wintergreen, Peppermint, Sassafras, etc., will result in preparations according to personal tastes. The amount of Benzocaine can be increased up to 10% but should not be reduced below 3% for best results.

THE DEPARTMENT OF THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY

C B JORDAN—CHAIRMAN OF EXECUTIVE COMMITTEE, A A G P, EDITOR OF THIS
DEPARTMENT

SUMMARY OF THE PROCEEDINGS OF THE 1935 MEETING

The thirty-sixth annual meeting of the American Association of Colleges of Pharmacy was held at the Multnomah Hotel, Portland, Oregon, Aug 5 and 6, 1935 Eighty-nine delegates from 38 member-colleges were in attendance Staff members from several non-member colleges in the United States and Canada were present at some of the sessions

ADDRESS OF THE PRESIDENT

President Little emphasized the necessity of colleges going forward and outlined the following procedure ' (1) Careful and conservative selection of students (2) Stressing professional training in undergraduate work (3) Adequate training and advice as to how these possibilities of professional service can best be realized following graduation, (4) Enlisting our services in promoting cooperative endeavor between physicians dentists and pharmacists, thus increasing their mutual effectiveness in behalf of public health ' He discussed the question of practical experience and urged the adoption of some policy as early as possible Graduate work should be developed in a conservative manner His recommendations were referred to the Committee on Resolutions

REPORT OF THE SECRETARY-TREASURER

Secretary Cooper reported a membership of 54 colleges with one in arrears for dues Distribution of Proceedings during the year was unusually wide The balance on hand was \$1053 08

The report was accepted and a committee appointed to audit the accounts which committee reported them correct

REPORT OF THE EXECUTIVE COMMITTEE

Chairman Jordan, of the Executive Committee, submitted the following summary of preliminary training of entering students in member-colleges

Total number entering for the year 1934-1935	2174
Number of high school graduates	2169
Number of special students	15
Number that had previous college training	600

This is an increase of nearly 10 per cent over the number entering in 1933-1934 Students with previous college training represented 27 6 per cent of the number entering Inasmuch as the 1934 meeting was in May graduates were reported for two years

COLLEGE YEAR, 1933-1934

Number receiving degrees from 3-year courses	1146
Number receiving degrees from 4-year courses	714
Total number completing 3- and 4-year courses	1860
Advanced degrees awarded	
Master of Science	27
Doctor of Philosophy	11
Honorary degrees	
Doctor of Science	1
Doctor of Philosophy	1

COLLEGE YEAR, 1934-1935

Number receiving degrees from 3-year courses	314
Number receiving degrees from 4 year courses	550
Total number completing 3 and 4 year courses (including 9 duplicates)	864
Advanced degrees awarded	
Master of Science	31
Doctor of Philosophy	8
Honorary degrees	4

Comparison of the two years cannot be made because the figures for 1934-1935 are incomplete but it is obvious that graduates are much fewer than in 1933-1934

Quoting from the report of the second series of visits to member colleges, Dean Jordan showed that there was much to be commended but he directed attention to three conditions that need correcting lack of adequate budgets, inadequate libraries and library facilities, and too heavy teaching loads

Announcement was made that the Association had been accepted as an associate society of the American Association for the Advancement of Science

The Committee recommended some minor revision of by laws, all of which were adopted

The Committee recommended that schools that had resigned from membership and that had since announced the time when they will not admit students to a course of less than four years be invited to participate in the discussions of the Association and that, if they accept the invitation, copies of the Proceedings and all official communication to member colleges be sent to them — *Adopted*

Report of the Syllabus Committee —Dean Beard reported for his Committee and expressed the hope that the three sponsoring bodies will leave to the judgment of the Committee the time of issuing the next revision — *Accepted*

Report of the Delegate to the American Council on Education —Dr Lyman reported concerning the work of the Council and that there had been an increase in membership and an increase in grants from the General Education Board for the support of the Council's work — *Accepted*

Report of the Committee on Educational Standards —Chairman Spease, of the Committee, discussed the overlapping of the work of this Committee and the Committee on Membership Standards, the reasons for requiring executive officers to be pharmacists and the advisability of requiring students to spend four years in a college of pharmacy —Report received and recommendations referred to the Committee on Resolutions

Report of the Committee on Curriculum and Teaching Methods —Dean Wilson reported that the Committee had considered some matters relative to courses in botany that had been referred to it at the 1934 meeting —Recommendations referred to the Committee on Resolutions

Report of the Committee on Relation of Boards and College —General Chairman D B R Johnson, presented a number of resolutions that had come from the districts that held meetings The report was received and at a later session the recommendations were referred to the Executive Committee

Report of the Committee on Libraries —Chairman Lee of the Committee submitted much valuable data gathered from the replies to a questionnaire —Report accepted and the recommendations referred to the Committee on Resolutions

Report of the Committee on Problems and Plans —Chairman Lyman, of the Committee, stated that the work of the year had been to get the reaction of outstanding men concerning the studies that should be undertaken first These with other suggestions by the Committee were discussed —Report accepted and the recommendations referred to the Committee on Resolutions

Report of the Committee on the Establishment of a Pharmaceutical Corps in the United States Army —In the absence of Chairman Leigh, the report was read by Vice-Chairman DuMez —Report accepted and the recommendations referred to the Committee on Resolutions

Report of the Committee on the List of Crude Drugs Prepared by District No 2 —Chairman Youngken reported extensive study made by members of his Committee which included one

person from each district —Report accepted and the recommendations referred to the Committee on Resolutions

Report of the American Council on Pharmaceutical Education —Dean DuMez reported that the work of formulating standards would be started at once and assignments of work would be out shortly after schools opened —*Accepted*

REPORTS OF OTHER COMMITTEES

A number of reports that contained no recommendations were received Professor Schick's report for the Committee on Activities of Students and Alumni contained many valuable suggestions

Special committees reporting without recommendations were the following Committee on Student Branches of the AMERICAN PHARMACEUTICAL ASSOCIATION, Professor Webster, Committee on Food and Drug Legislation, Dean Jordan —*Accepted*

Though not inactive the Committee on Membership Standards had nothing ready to report

For the Committee on Code Matters, Chairman Rudd reported 'Died, buried, forgotten and the report was accepted

REPORTS OF SPECIAL REPRESENTATIVES

Dr Youngken reported on Biological Abstracts, Dr Rising for the representatives to the National Conference on Pharmaceutical Research, Professor Hayman for the representatives to the National Drug Trade Conference, Dean McCloskey as representative to the National Association of Retail Druggists —*Reports accepted*

REPORT OF THE COMMITTEE ON RESOLUTIONS

The Committee on Resolutions, consisting of Dean Wilson, *Chairman*, Professor Stuhr, Professor Eby, Dean Mollett and Dean O Connell, submitted the following report

From the President's address

'1 We recommend that all matters relating to apprenticeship be referred to the Executive Committee with a request for proper consideration and report at the 1936 meeting' —*Adopted*

2 We recommend that the Committee on Curriculum and Teaching Methods be requested to compile all available material on curricula and present it at the 1936 meeting for proposal as an 'ideal pharmaceutical college curriculum' —*Adopted*

'3 We recommend that the matter of publishing all of the past presidential addresses be referred to the Executive Committee' —*Adopted*

"4 We recommend that the Committee on Food and Drug Legislation be continued" —*Adopted*

5 We recommend the appointment of a Committee on Professional Relations with duties as outlined by the President to consider the possibility of joint meetings of the A M A and A P H A in the future —*Adopted*

6 We recommend the appointment of a special committee on pharmacy aptitude tests —*Adopted*

From the report of the Committee on Curriculum and Teaching Methods

1 We recommend that the Syllabus Committee on the occasion of the next revision of the Syllabus be requested to incorporate an outline for a course in pharmaceutical botany in addition to the outline for a general course —*Adopted*

"2 We recommend that the revision of the Syllabus in the future be on a decennial basis and contemporary with the issuance of the U S P and N F —*Adopted*

From the Report of the Committee on Problems and Plans

'1 We recommend that the Committee on Problems and Plans with the addition of Secretary Cooper be authorized to ascertain the cost and feasibility and desirability of the publication of a quarterly journal to be known as the American Journal of Pharmaceutical Education, the report to be made at the next annual meeting' —*Adopted*

2 We recommend that Secretary Cooper be requested to write Dr H B Ward a letter of appreciation for the assistance he has rendered pharmacy as Secretary of the American Association for the Advancement of Science' —*Adopted*

From the Report of the Committee on Educational Standards

'1 We recommend that the Committee on Educational Standards and the Committee on Membership Standards be combined under the name, 'The Committee on Educational and Membership Standards' "—*Adopted*

The following recommendation, offered as a substitute for that of the Committee, was adopted

"2 We recommend that it be the sense of the Association that in case of appointments to administrative positions in colleges of pharmacy, other things being equal, preference be given to men who have had pharmaceutical training "

The recommendation having to do with the length of time that a student must spend in a college of pharmacy, which was disapproved by the Committee on Resolutions, after much discussion, was tabled Immediately thereafter a motion prevailed that the whole matter be referred to the Executive Committee for its consideration, report to be made at the 1936 meeting

From the Report of the Committee on Libraries

"We recommend that the Committee on Libraries be continued and their recommendations approved "

The recommendations referred to are

'1 That the American Association of Colleges of Pharmacy make detailed studies and reports upon the following items concerning pharmacy libraries

"(a) A minimum periodical and journal list

"(b) A minimum list of standard reference books covering the fields of pharmacy, chemistry, materia medica, etc

"(c) The qualifications of school librarians

"(d) The extent and scope of so called library courses as listed in the catalogs

'(e) The feasibility of effecting exchanges of duplicate library material for the benefit of all the libraries "

'2 That in the reappointment of this Committee it be given a tenure of at least three years "—*Adopted*

From the Report of the Committee on the List of Drugs Submitted by District No 2

"1 That the American Association of Colleges of Pharmacy is not in favor of restricting the teaching of drugs in its member colleges to any arbitrarily drafted list nor does it approve of any scheme of elimination except by extensive national survey

"2 That we recommend to the National Association of Boards of Pharmacy that the scope of examinations on drugs given by all state boards of pharmacy should embrace the U S P and N F drugs and that questions pertaining to the N N R and other unofficial products should be left to the discretion of the respective boards who are in position to determine the frequency of use and decide on the importance of the medicinals prescribed in the particular district concerned "

'In the judgment of the Committee on Resolutions the two recommendations constitute a matter for consideration in a joint meeting of the Boards and Colleges and the Committee so recommends "—*Adopted*

From the Committee on the Establishment of a Pharmaceutical Corps in the United States Army

"1 That the Committee be continued, that it be instructed to continue its efforts to effect improvement in the pharmaceutical service in the Army and to obtain the recognition therein for pharmacy of the status to which it is entitled by virtue of the traditions and the useful service which it is prepared by education and training to render

'2 That the Committee be instructed to cooperate with the Surgeon General in obtaining the passage of legislation which will bring about the substance of Recommendation No 1

If the objective as stated in No 1 cannot be attained by this procedure it is recommended

3 That the Committee be instructed to obtain the desired improvement in pharmaceutical service and its concomitant recognition in the Army by direct appeal to Congress "

As summarized by the Committee on Resolutions,

'We recommend that the Committee on the Establishment of a Pharmaceutical Corps in the United States Army be continued and instructed to use its best judgment in securing proper recognition for pharmacy in the United States Army "—*Adopted*

'The following resolution originated in the joint meeting of the Boards and Colleges

"That a committee be appointed to consider jointly with a similar committee from the N A B P the character of the examination questions given by examining boards and colleges and to present a report at a subsequent joint meeting of the Boards and the Colleges"—*Adopted*

The following resolution was offered by Dr Lyman and modified by Dean Bradley

"That we recommend to the Council of the AMERICAN PHARMACEUTICAL ASSOCIATION that our annual meeting be held either during the third or fourth week of August"—*Adopted*

The following resolution was offered by Dr Rudd

'WHEREAS, The work of the American Association of Colleges of Pharmacy has increased to such an extent that its sessions are hopelessly prolonged with committee reports and other highly important business, and

"WHEREAS More time for full discussion would make our meetings more interesting and instructive, *be it*

"*Resolved First*, that the Executive Committee use its best efforts to have all committee reports limited to not more than ten minutes, except in unusual cases, *second* that more time be arranged for discussions"—*Adopted*

PAPERS

Dr Lee and Dr DeKay presented a paper on "The Four-Year Course in Pharmacy" which brought out the changes and trends that are evident since 1929 when they made a similar study

Two papers which were directly connected with the work of the Committee on Problems and Plans were presented "Objective Tests" by Dr DeKay with sample questions on qualitative analysis and "Objectives and Achievement Tests" by Dr Klemme with sample questions on organic chemistry

A third paper "The Teaching of Bacteriology to Pharmacy Students," was presented by Dr Reddish

ANNUAL DINNER

The guest speaker at the annual dinner was Dr E H Lauer Dean of Faculties, at the University of Washington

NEW MEMBER COLLEGE

The Executive Committee recommended that the application of the Connecticut College of Pharmacy for membership be accepted The vote completed by mail since the convention, gave more than the necessary two thirds majority

OFFICERS FOR 1935-1936

President Robert C Wilson, Athens, Georgia
Vice President Homer C Washburn, Boulder, Colorado
Secretary Treasurer Zada M Cooper, Iowa City, Iowa
Chairman of Executive Committee Charles B Jordan, La Fayette, Indiana
Members of the Executive Committee (to serve two years) Ernest Little, Newark, New Jersey,
 Rufus A Lyman Lincoln, Nebraska
Member of the Syllabus Committee Henry A Langenhan Seattle, Washington

JOINT SESSION

The report of the Fairchild Scholarship Committee was presented by Chairman Eberle The winner was Mr Zienty who was graduated in June from the University of Illinois College of Pharmacy

Dr Lemon presented a paper "Examination Questions Both College and Board Questions" Dr Fischelis talked briefly on "The Possibilities and Limitations of Cooperation between Boards of Pharmacy and Colleges of Pharmacy"

Dean D B R Johnson read a report which included resolutions coming from various district meetings The report was received and the resolutions referred to the Committees on Resolutions of the individual bodies

CONFERENCE OF TEACHERS OF PHARMACY

The program consisted of a discussion of "Pharmaceutical Technique as Described in the Syllabus" Officers elected for the ensuing year were Dean E T Motley *Chairman*, Dean R C Wilson *Vice Chairman*, Dr C O Lee, *Secretary*

CONFERENCE OF TEACHERS OF CHEMISTRY

In the absence of Chairman Jacobs, Dr Uhl presided

Two papers were read and discussed "Instruction about Synthetics" by Dr Lynn and The Teaching of Food and Drug Analysis" by Professor Glover

Officers elected for the ensuing year were *Chairman*, Dr A H Uhl, *Secretary*, Dr Lewis C Britt

CONFERENCE OF TEACHERS OF PHARMACOGNOSY AND PHARMACOLOGY

In the absence of Chairman Schwarz, Dean Mollett presided

"Pharmacology Definition and Scope of the Course for Pharmacy Majors" was discussed by Dr Burlage and Dr Serles

A paper, "Should the Term *Materia Medica* Be Deleted from Our Catalogs and from State Board Examinations" was presented by Dean Mollett

Dr Bacon discussed "Should Undergraduate Students in Pharmacy Do Animal Experimentation or Should the Course Be Taught by Demonstrations," showing a moving picture of the pharmacology of digitals in connection with his discussion

Biological Assays for Undergraduate Students" was discussed by Dean D B R Johnson

Correlation of Courses in Pharmacology and Physiology" was discussed by Dr Dickinson

The following papers were read by title "Pharmacology as Basis for Improving Relations with Physicians," Dr B V Christensen, "Suggestions for a Course in Botany for Pharmacy Students" Dr Bienfang, "A Study of the Records of the Same Class in Botany and Pharmacognosy," Dr Dunn, "The British Pharmacognosy Syllabus" Dr Bienfang, "The Content of a Pharmacognosy Course," Professor Fiero

Officers elected for the ensuing year were *Chairman*, Dean C E Mollett, *Secretary*, Dr Ralph Bienfang

CONFERENCE OF TEACHERS OF PHARMACEUTICAL ECONOMICS

In the absence of Chairman Olsen, Dean McCloskey presided

The following topics were discussed "Trends in Drug Store Profits, 1932, 1933, 1934," "Accounting Records Necessary and Desirable in Drug Stores," "The Operation of State Fair Trade Acts for Re sale Control"

Officers elected for the ensuing year were *Chairman*, Dean J F McCloskey, *Secretary*, Dean W H Rivard

ZADA M COOPER, *Secretary*

Approved Charles B Jordan, *Chairman*, Executive Committee

We are in receipt of a monograph on "The Leech Monopoly in Croatian Slavonica," by Prof Dr A Vrgoc (Zagreb) published in 1935, in *Apothekarskog Vjesnikas*. We thank the author

We are also indebted to Dr Antun Vrgoc for a copy of his *Pharmacognosy and Commentary on the Yugoslavian Pharmacopœia*, published in Croatian. The author has autographed the volume which contains very nearly 400 illustrations, more than 500 pages of text and includes a useful drug map of Jugoslavonica. The citation of literature covers two pages. The volume is a valuable addition to the Library and appreciation is expressed to the author

We are in receipt of a reprint from *Berichte*

of the German Pharmaceutical Society dealing with investigations of the leaves of interesting members of polypodiaceae—from the pharmaceutical Institute of the University of Basel

The Philadelphia College of Pharmacy and Science has donated a copy of "Popular Science Talks" Volume XII. The volume contains the following addresses

"The Herbs and the Stars" by Charles H LaWall, "Conquest of the Planet Earth," by George Rosengarten, "Living Light," by Arno Viehoveer, "Tooth Truths," by Ivor Griffith, "Free Air," by Arthur Osol, "Famous Finds by Pharmacists," by John Kramer. The History and Romance of Microscopy" by Louis Gershenfeld, "Silver, Metal of the World," by Clifton C Pines

UNITED STATES PHARMACOPŒIA

ABSTRACT OF PROPOSED CHANGES WITH NEW STANDARDS AND DESCRIPTIONS
ELEVENTH REVISIONCopyright 1935 by the Board of Trustees of the United States Pharmacopœial Convention *
All Rights Reserved

PART III—VOLATILE OILS

The Pharmacopœial Convention of 1930 recommended that 'abstracts of changes proposed for the U S P XI and new standards and descriptions' be published before final adoption that those who are not members of the Revision Committee may have an opportunity for comment and criticism

In compliance with this recommendation, the following abstracts are submitted The nomenclature and the exact wording does not necessarily represent that to be finally adopted

Comments should be sent to the chairman of the Revision Committee

E FULLERTON COOK
43rd and Woodland Avenue,
Philadelphia Pa

Eucalyptol—The word "cooling" is added to the physical description of taste The statement regarding solubility in water is omitted

A refractive index range of 1.455 to 1.460 has been added

Eugenol—The specific gravity range has been changed to 1.066 to 1.070 at 25° C

A refractive index range of 1.540 to 1.542 has been added

The test for hydrocarbons now reads as follows

'Dissolve 1 cc of Eugenol in 20 cc of half-normal sodium hydroxide and add 18 cc of distilled water an immediate clear solution results (*hydrocarbons*) which may become turbid when exposed to air

Methyl Salicylate—A refractive index range of 1.535 to 1.538 has been added

The test for petroleum products has been omitted as birch oil sometimes gives positive results

The following tests have been revised or added

Five cc of Methyl Salicylate when shaken with 25 cc of freshly boiled and cooled distilled water requires not more than 0.45 cc of tenth normal sodium hydroxide for neutralization phenol red T S being used as the indicator (limit of free acid)'

Tests for purity A solution of one volume of Methyl Salicylate in two volumes of alcohol is neutral or slightly acid to moistened litmus paper

Oleum Amygdalæ Amarae—*Assay of benzaldehyde* Add 0.1 cc of bromphenol blue indicator to 25 cc of half normal hydroxylamine hydrochloride and titrate with half normal alcoholic potassium hydroxide to the production of a greenish blue color Pour this mixture into a flask fitted with a glass stopper containing about 1 Gm of Oil of Bitter Almond, accurately weighed Shake well and then titrate with half normal alcoholic potassium hydroxide until the yellow color changes to a greenish blue Continue shaking and titrating until the greenish blue color is permanent Multiply the number of cc of half normal potassium hydroxide used by 5.3 and divide the product by the weight of oil of bitter almond taken to obtain the per cent

Oleum Anisi—The labeling requirement has been deleted A requirement is added whereby congealed oil should be melted and mixed before using The refractive index range is now 1.5530–1.5600

* Permission to reprint for purposes of comment can be had on application to the Chairman of the Board of Trustees James H. Beal Fort Walton Fla

Oleum Aurantii—Change color description to read "a yellow or intense yellow or orange or deep orange liquid" The amount of oil taken for the residue test has been reduced from 25 Gm to 10 Gm

Oleum Cadinum—"Wood" has been changed to "woody portions" in the definition The solubility test in ether has been changed to read as follows

"Almost completely soluble in Ether with not more than a slight flocculent precipitate"

The specific gravity range has been changed to "0.950 to 1.055 at 25° C"

Oleum Carvi—The only change in this test is that the strength of the sodium bisulfite solution used in adjusting the neutrality has been increased from 5 per cent to 25 per cent

Oleum Caryophylli—The only change in this text is the substitution of normal potassium hydroxide for potassium hydroxide T S

Oleum Chenopodii—The refractive index range is now 1.4723 to 1.4770 at 20° C

Oleum Cinnamomi—The word "steam distillation" is omitted in the definition Changes in the assay method have been made as under *Oleum Carvi* The refractive index range is now 1.6020 to 1.6135

Oleum Coriandri—The optical rotation has been changed to "varies from +8° to +15° in a 100 mm tube at 25° C" The refractive index range is now 1.4620 to 1.4720 at 20° C

Oleum Eucalypti—The solubility ratio in 70 per cent alcohol has been changed to read "The oil is soluble in 5 volumes of 70 per cent alcohol, by volume"

The former test for phellandrene nitrite has been replaced by the following

"Mix 2.5 cc of oil of eucalyptus with 5 cc of petroleum benzine, add 5 cc of a solution of sodium nitrite made by dissolving 5 Gm of sodium nitrite in 8 cc of distilled water, then gradually add 5 cc of glacial acetic acid No crystals of phellandrene nitrite should form within ten minutes"

The refractive index range is now "1.4580 to 1.4700 at 20° C"

Oleum Juniperi—The refractive index range is now "1.4780 to 1.4840 at 20° C"

Oleum Lavandulae—The solubility test in 70 per cent alcohol now reads "The oil is soluble in 4 volumes of 70 per cent alcohol by volume"

The refractive index range is now "1.4590 to 1.4700 at 20° C"

Oleum Limonis—The new text for oil of lemon is as follows

OLEUM LIMONIS

Oil of Lemon

Oil Limon -Lemon Oil

The volatile oil obtained by expression without the aid of heat from the fresh peel of the fruit of *Citrus medica* var *Limonum* (Risso) Hooker filius (Fam *Rutaceae*) with or without previous separation of the pulp and the peel

Description and physical properties—A pale yellow to deep yellow or greenish yellow liquid, having the characteristic odor and taste of the outer part of fresh lemon peel

Tests for identity and purity The Oil is soluble in 3 volumes of alcohol and in all proportions in dehydrated alcohol, carbon disulfide, and in glacial acetic acid

Specific gravity 0.849 to 0.855 at 25° C

Optical rotation Varies from +57° to +65.5° in a 100-mm tube at 25° C

Refractive index 1.4742 to 1.4755 at 20° C

A solution of the recently expressed Oil in alcohol (1 in 3) is neutral or only slightly acid to moistened litmus paper

Oil of Lemon when distilled as described under *Oleum Aurantii*, gives the following results The angle of rotation of the first 5 cc is not more than 5 degrees less than that of the original Oil The refractive index of this same portion is not less than 0.0010 and not more than 0.0027 lower than that of the original Oil

Preserve in completely filled, well-stoppered, amber-colored bottles, in a cool place, protected from light

Oil of Lemon which has a terebinthinate odor must not be used or dispensed

AVERAGE DOSE Metric, 0.1 cc—Apothecaries, 1½ minims

Oleum Menthae Piperitæ—The optical rotation range now reads "varies between 18° and 32° in a 100 mm tube at 25° C"

The following test has been added

'Mix in a dry test-tube 3 drops of Oil of Peppermint with 5 cc of a solution of 1 volume of nitric acid in 300 volumes of glacial acetic acid, and place the tube in a beaker of boiling water. In from one to five minutes a blue color develops which on continued heating, deepens and shows a copper-colored fluorescence, and then fades, leaving a golden yellow solution (distinction from oil of *mentha arvensis*)'

In drying the oily layer during the assay for total menthol anhydrous sodium sulfate has been substituted for fused calcium chloride

Oleum Menthae Viridis—The carvone requirement has been increased from 43 per cent to 50 per cent, with a corresponding change in the assay. The optical activity now reads 'varies from -48° to -59° in a 100-mm tube at 25° C'

The solubility requirement now reads "A solution of the recently distilled oil in an equal volume of 80 per cent alcohol is neutral or only slightly acid to moistened litmus paper" and "The oil is soluble in 1 volume of 80 per cent alcohol, by volume, forming a clear solution"

Oleum Myristicæ—The optical rotation now reads "varies from +10° to +30° in a 100 mm tube at 25° C". The refractive index range has been changed to "1.4740 to 1.4880 at 20° C"

Oleum Pini Pumilionis—The solubility test has been changed to read as follows "The oil is soluble in 4 to 8 volumes of 90 per cent alcohol by volume". The optical rotation requirement now reads "varies from -5° to -12° in a 100-mm tube at 25° C". The acidity test has been eliminated. It is now required that less than 10 per cent of the oil distills below 165° C.

Oleum Rosæ—This is a new text as follows

OLEUM ROSÆ

Oil of Rose

The volatile oil distilled from the fresh flowers of *Rosa gallica* L. and *Rosa damascena* Miller, and varieties of these species (Fam. *Compositæ*)

Description and physical properties A colorless or yellow liquid having the characteristic odor and taste of rose

Tests for identity and purity Oil of Rose at 25° C is a viscous liquid. Upon gradual cooling it changes to a translucent crystalline mass, which may be easily liquefied by warming.

Specific gravity 0.848 to 0.863 at 30° C compared with water at 15° C

Optical rotation varies from -1° to -4° in a 100 mm tube at 25° C

Refractive index 1.457 to 1.463 at 30° C

One cc of Oil of Rose mixes with 1 cc of chloroform without turbidity. Upon adding 20 cc of 90 per cent alcohol by volume to this solution the resulting liquid is neutral or faintly acid to moistened litmus paper and deposits a crystalline residue upon standing.

Storage—Preserve Oil of Rose in well stoppered, completely filled containers in a cool place and protected from light.

Oleum Rosmarini—The optical rotation requirement now reads "varies from -5° to +10° in a 100 mm tube at 25° C". The refractive index range is now "1.4640 to 1.4760 at 20° C".

Oleum Santali—The refractive index range is now "1.5000 to 1.5100 at 20° C, in a 100 mm tube at 25° C".

Oleum Sassafras—The optical rotation requirement now reads "varies from +2° to +4° in a 100 mm tube at 25° C".

Oleum Sinapis Volatile—The following tests have been added

"To 3 Gm of the oil, gradually add 6 Gm of sulphuric acid, meanwhile keeping the liquid cool Upon subsequent agitation the mixture will evolve sulfur dioxide, but will remain of a light yellow color, while the pungent odor of the oil will entirely disappear "

"To 3 Gm of the oil add 3 Gm of alcohol in a small flask, and then add 6 Gm of ammonia water Upon warming to 50° C , the liquid will at first become clear and will then subsequently deposit crystals of thiosinamine "

UNITED STATES PHARMACOPŒIA

ABSTRACT OF PROPOSED CHANGES WITH NEW STANDARDS AND DESCRIPTIONS ELEVENTH REVISION

Copyright 1935 by the Board of Trustees of the United States Pharmacopœial Convention *
All Rights Reserved

PART IV—EXTRACTS, FLUIDEXTRACTS AND TINCTURES—SOLUTIONS, SPIRITS AND SYRUPS— CERATES, OINTMENTS AND MISCELLANEOUS GALENICALS

The Pharmacopœial Convention of 1930 recommended that "abstracts of changes proposed for the U S P XI and new standards and descriptions" be published before final adoption, that those who are not members of the Revision Committee may have an opportunity for comment and criticism

In compliance with this recommendation, the following abstracts are submitted The nomenclature and the exact wording does not necessarily represent that to be finally adopted

Comments should be sent to the chairman of the Revision Committee

E FULLERTON COOK,
43rd and Woodland Avenue
Philadelphia, Pa

Distilled Water—Distilled water is now used in the Pharmacopœia in all formulas where water was formerly directed

EXTRACTS, FLUIDEXTRACTS AND TINCTURES

Only formulas and directions are considered here Assays are reported elsewhere

Extracta—General chapter rewritten—extracts to be evaporated at not over 60° C

Extractum Belladonnæ—Maceration of drug for 16 instead of 48 hours Evaporation under reduced pressure at not over 60° C

Extractum Fells Bovis—Oxgall evaporated to 200 cc, 500 cc alcohol added, stand 24 hours, decant, mix residue with 250 cc alcohol, filter wash filter with 250 cc alcohol Evaporate alcoholic liquids to dryness at 80° C , add starch to make the extract weigh one eighth the weight of the original Oxgall

Extractum Glycyrrhizæ Purum—Percolate is evaporated to one half its volume by boiling under atmospheric pressure and final evaporation conducted on a water-bath

Extractum Hyoscyami—Same as for *Extractum Belladonnæ*

Extractum Nucis Vomice—First menstruum consists of 750 cc alcohol, 10 cc acetic acid 240 cc water Second menstruum consists of alcohol 3 and water 1 Maceration 24 instead of 48 hours Evaporated at not over 100° C

Extractum Stramonii—Same as for *Extractum Belladonnæ*

Fluidextracta—General chapter rewritten—evaporation to be made at not over 60° C Dampened drug allowed to stand for 15 minutes instead of 6 hours

Fluidextractum Belladonnæ Radicis—Menstruum—alcohol 4, water 1

Fluidextractum Cascaræ Sagradæ Aromaticum—Formula changed to the following

Cascara Sagrada	1000	Gm
Magnesium Oxide	120	Gm

* Permission to reprint for purposes of comment can be had on application to the Chairman of the Board of Trustees James H Beal, Fort Walton, Fla

Pure Extract of Glycyrrhiza	40	Gm
Saccharin	2	Gm
Oil of Anise	0 65	cc
Oil of Coriander	0 15	cc
Methyl Salicylate	0	cc
Alcohol	200	cc
Water sufficient to make	1000	cc

Evaporated at not over 100° C

Fluextractum Glycyrrhizæ—Ammonia water is added to the percolate which is evaporated by boiling, to 1500 cc filtered, evaporated to 750 cc and 250 cc of alcohol added

Fluextractum Ipecacuanhæ—Menstruum, alcohol 3, water 1 Maceration 72 hours Percolate reduced, at 60° C to 1000 cc 2000 cc water added stand over night filtered, evaporated to 600 cc and 40 cc of Hydrochloric Acid and 300 cc of alcohol added

Fluextractum Zingiberis—Official Ginger is now to be the Jamaica variety only Menstruum alcohol 9 water 1 Maceration over night

Opium Granulatum—Dried at 98° C Powder to pass through a number 16 sieve with not more than 10 per cent through a number 60 sieve

Opium Pulveratum—Dried at 98° C

Tinctura Aconiti—Menstruum alcohol 3, water 1 p_H adjusted to 3 0

Tinctura Auranti Amari—Menstruum, alcohol 2, water 1 Macerate 12 to 16 hours

Tinctura Belladonnæ—Menstruum, alcohol 3, water 1

Tinctura Cantharidis—Glacial acetic acid increased to 100 cc Macerated 4 days before percolating

Tinctura Capsici—Menstruum alcohol 9, water 1 Macerate 3 hours

Tinctura Cinchonæ Composita—Menstruum—First—Alcohol 130 cc, diluted hydrochloric acid 15 cc, water 50 cc Second—Alcohol 2 water 1 Percolate to 925 cc and add 75 cc of glycerin

Tinctura Colchici—Menstruum, alcohol 2, water 1

Tinctura Digitalis—The fat is not extracted from the drug for the new tincture Formula and directions are otherwise the same

Tinctura Gentianæ Composita—Macerate 12 to 16 hours

Tinctura Hyoscyami—Menstruum alcohol 3 water 1

Tinctura Kino—Strength raised to 20 per cent Menstruum, alcohol 9, glycerin 1

Tinctura Opii—After exhausting the drug the percolate is evaporated to 400 cc, the concentrate boiled for 15 minutes and then allowed to stand over night The next day it is heated to 80° C, the paraffin added and the heat increased until the paraffin melts The mixture is then beaten thoroughly and cooled

The paraffin is then removed the liquid filtered distilled water added to make 750 cc then 188 cc of alcohol The liquid is now assayed and sufficient menstruum added to make each 100 cc contain 1 Gm of anhydrous morphine

Tinctura Opii Camphorata—Tincture of Opium (40 cc) replaces Opium (4 Gm)

Tinctura Stramonii—Menstruum alcohol 3, water 1

Tinctura Veratri Viridis—Menstruum first alcohol 200 cc, hydrochloric acid 2 cc then alcohol, p_H adjusted between 4 and 5

SOLUTIONS SPIRITS SYRUPS

Liquor Calcii Hydroxidi—The solution is to be prepared from calcium hydroxide, 3 Gm per 1000 cc instead of calcium oxide

Liquor Ferri Tersulphatis—The formula and directions are omitted

Liquor Iodii Mitis—This is a new antiseptic for first aid treatment of wounds

LIQUOR IODII MITIS

Mild Solution of Iodine

Mild Solution of Iodine contains in each 100 cc, not less than 1 8 Gm and not more than 2 2 Gm of I and not less than 2 1 Gm and not more than 2 5 Gm of NaI

Iodine	20 Gm
Sodium Iodide	23 Gm
Diluted alcohol, a sufficient quantity, to make	1000 cc

Dissolve the iodine and sodium iodide in a sufficient quantity of diluted alcohol to make the product measure 1000 cc

Description and physical properties A transparent liquid having a reddish brown color and the odor of iodine and of alcohol

Test for identity A drop of the Solution added to 1 cc of starch T S, diluted with 10 cc of distilled water, produces a deep blue color

Assay for sodium iodide Proceed as directed for potassium iodide under *Liquor Iodæ Aquosa*

Assay for iodine Proceed as directed under *Liquor Iodæ Aquosa*

Storage Preserve Mild Solution of Iodine in glass bottles, closed with stoppers resistant to corrosion and in a cool place, protected from light

Liquor Magnesi Citratis—The formula of the U S P IX which contained 33 Gm of Citric Acid instead of the 35 Gm of the U S P X has been accepted and the following test for citric acid added

Transfer exactly 10 cc of Solution of Magnesium Citrate to a 250-cc beaker Gently agitate the contents for two minutes then dilute with 30 cc of distilled water Add 3 drops of phenolphthalein T S and normal sodium hydroxide until a permanent pink color is just produced and then acidify with 4 drops of normal hydrochloric acid Add 20 cc of calcium chloride T S and concentrate, by boiling, to about 30 cc, stirring constantly with a rubber-tipped glass rod during the boiling While hot, transfer the precipitate completely to a filter of from 9 to 11 cm in diameter with the aid of small quantities of boiling distilled water Then wash the precipitate five times with boiling distilled water Collect the filtrate and washings in a 150-cc beaker Concentrate the filtrate and washings, by boiling, to about 20 cc Add ammonia T S, drop by drop, until a distinct red color is produced and then concentrate to about 10 cc While hot transfer the precipitate completely to a filter of from 7 to 9 cm in diameter with the aid of small quantities of boiling distilled water and wash the precipitate six times with about 5 cc of boiling distilled water

Dry the two filters with the precipitates and incinerate them together in a loosely covered platinum crucible, heating at first at a low temperature until the precipitates are well charred and then removing the cover and raising the temperature until the residue is practically white If a gas flame is used it must not come in contact with the mass in the crucible Cool place the crucible with its contents in a suitable beaker, add about 30 cc of distilled water, and then exactly 50 cc of half-normal hydrochloric acid When the residue has dissolved remove the crucible rinsing it well with distilled water into the beaker Add about 100 cc of distilled water, cover the beaker with a watch glass and boil gently for about ten minutes Cool and titrate the excess of acid with half-normal sodium hydroxide, using phenolphthalein T S as the indicator Not less than 26 cc of half-normal hydrochloric acid is consumed

Liquor Potassi Arsenitis—The formula is changed to

Arsenic Trioxide	10 Gm
Potassium Bicarbonate	7.6 Gm
Alcohol	30 cc
Distilled water to make	1000 cc

The preparation is without color and is not excessively alkaline

Liquor Sodii Hypochloritis—This is a new text It is a solution containing 4 per cent of NaOCl There is no formula

Liquor Sodii Hypochloritis Chirurgicæ—The formula is changed to

Solution of Sodium Hypochlorite	1000 cc
Sodium Bicarbonate	
Distilled Water, of each, to make	6000 cc

Spiritus Anisi—The following rubric and assay have been added

Each 100 cc shall contain not less than 9 cc and not more than 11 cc of Oil of Anise

Assay Transfer exactly 5 cc of the Spirit to a Babcock flask. Attach the bottle to a suction pump and while maintaining a relatively high degree of vacuum, evaporate most of the alcohol by repeatedly but carefully immersing the bottle in hot water and immediately withdrawing it. Throughout the operation the flask must be vigorously rotated. Care must be taken that none of the liquid be drawn out of the flask. When the most of the alcohol has been removed, cool the liquid and add exactly 1 cc of kerosene from a pipette calibrated to deliver that amount and mix well. Then add sufficient saturated calcium chloride solution acidified with hydrochloric acid to almost fill the bulb of the flask. Rotate the flask vigorously to insure thorough mixing, then add sufficient of the calcium chloride solution to bring the separated oil into the neck of the flask. Centrifuge for five minutes and then read the volume of oil in the stem. Subtract 5 divisions for the kerosene added and multiply the remaining volume by 4.2 to obtain the percentage of oil, by volume, in the Spirit.

Spiritus Aurantii Compositus—The following rubric and assay have been added.

Each 100 cc shall contain not less than 25 cc and not more than 30 cc of mixed Oils.

Assay Transfer exactly 2 cc of the Spirit to a Babcock flask, add exactly 1 cc of kerosene from a pipette calibrated to deliver that amount and mix well. Then add sufficient saturated calcium chloride solution, acidified with hydrochloric acid, to almost fill the bulb of the flask. Rotate the flask vigorously to insure thorough mixing, then add sufficient of the calcium chloride solution to bring the separated oil into the neck of the flask. Centrifuge for five minutes and then read the volume of oil in the stem. Subtract 5 divisions for the kerosene added and multiply the remaining volume by 10.5 to obtain the percentage of oil, by volume, in the Spirit.

Spiritus Cinnamomi—The following rubric and assay have been added.

Each 100 cc shall contain not less than 9 cc and not more than 11 cc of Oil of Cinnamon. For the assay see *Spiritus Anisi*.

Spiritus Lavandulae—The following rubric and assay have been added.

Each 100 cc shall contain not less than 4 cc and not more than 6 cc of Oil of Lavender.

Assay Transfer exactly 10 cc of the Spirit into a Babcock flask, add exactly 1 cc of kerosene from a pipette calibrated to deliver that amount and mix well. Then add sufficient saturated calcium chloride solution acidified with hydrochloric acid, to almost fill the bulb of the flask. Rotate the flask vigorously to insure thorough mixing, then add sufficient of the calcium chloride solution to bring the separated oil into the neck of the flask. Centrifuge for five minutes and then read the volume of oil in the stem. Subtract 5 divisions for the kerosene added and multiply the remaining volume by 2.2 to obtain the percentage of oil by volume.

Spiritus Menthae Piperitae—

The leaves are macerated with 900 cc of alcohol instead of 800 cc and the oil is added after the mixture is filtered.

The following rubric and assay have been added. Each 100 cc shall contain not less than 9 cc and not more than 11 cc of Oil of Peppermint.

Assay Follow assay methods as given under *Spiritus Aurantii Compositus* except the factor for multiplying the "remaining volume" is 4.2.

Spiritus Menthae Viridis—The following rubric and assay have been added.

The leaves are macerated with 900 cc of alcohol instead of 800 cc and the oil is added after the mixture is filtered.

Each 100 cc shall contain not less than 9 cc and not more than 11 cc of Oil of Spearmint.

Assay Follow assay methods as given under *Spiritus Aurantii Compositus* except the factor for multiplying the "remaining volume" is 4.2.

Syrupus Pruni Virginianae—The drug is macerated for 1 hour, the percolation is allowed to proceed rapidly and 20 cc of alcohol is added to the preparation. An alternative method for dissolving the sugar by percolation is added.

OINTMENTS AND MISCELLANEOUS GALENICALS

Emplastrum Adhaesivum—The tension test is omitted. 100 sq cm of plaster to contain at least 1.5 Gm of plaster mass. Zinc oxide if used reduced from 20 per cent to 15 per cent.

Emplastrum Belladonnae—100 sq cm of plaster to contain at least 2.5 Gm of the belladonna plaster mass consisting of adhesive plaster and an extract of belladonna root.

Emulsum Petrolati Liquidum—This is a new text as follows.

EMULSUM PETROLATI LIQUIDI

Emulsion of Liquid Petrolatum

Emuls Petrolat Liq

Liquid Petrolatum	500	cc
Acacia, in very fine powder	125	Gm
Syrup	100	cc
Vanillin	0.035	Gm.
Alcohol	60	cc
Distilled Water, a sufficient quantity, to make	1000	cc

Mix the liquid petrolatum with the powdered acacia in a dry mortar, add 250 cc of distilled water all at once and emulsify the mixture. Then add, in divided portions and triturating after each addition, a mixture of the syrup, 50 cc of distilled water and the vanillin, dissolved in the alcohol. Finally add sufficient distilled water to make the product measure 1000 cc.

NOTE In preparing Emulsion of Liquid Petrolatum other methods of emulsification may be used and the quantity of acacia may be reduced or it may be replaced by agar, gelatin, tragacanth or mixtures of any of these emulsifying agents, provided the resulting emulsion is similar in viscosity and appearance to the emulsion made by the formula suggested above.

AVERAGE DOSE Metric, 30 cc—Apothecaries, 1 fluidounce

Emulsum Olei Morrhuae—No change except that other emulsifying agents may be employed if the resulting product retains the characteristics of the emulsion prepared by the formula given.

Glycerium Acidi Tannici—Directions changed so that the tannic acid and the sodium citrate are first rubbed up with part of the glycerin, then the balance of the glycerin is added and the mixture is heated on a sand bath until solution results.

Infusa—The 50 Gm portion of drug is moistened with 50 cc of cold distilled water, in a suitable vessel, preferably earthenware, and allowed to stand for 15 minutes. Then 900 cc of boiling distilled water is poured upon it, the vessel covered, and the drug macerated for a half hour. It is then strained and distilled water added to make 1000 cc.

Linimentum Camphoræ—The following assay has been adopted.

Assay Place approximately 5 cc of Camphor Liniment in a dried and weighed 120 cc Erlenmeyer flask and weigh accurately. Connect the flask with a U-shaped drying tube, place the flask and tube in an air oven maintained at 110° C and pass a rapid stream of carbon dioxide through the U-tube into the flask for two hours. The orifice of the gas delivery tube should be about 15 mm above the surface of the Liniment. Remove the flask and Liniment, blow out the remaining carbon dioxide with dry air, cool the flask in a desiccator and weigh. The loss in weight is not less than 19 per cent and not more than 21 per cent of the weight of Camphor Liniment taken for the assay.

Linimentum Chloroformi—An assay has been added.

Assay Place 50 cc of alcohol in a 100-cc volumetric flask, and measure exactly 10 cc of Chloroform Liniment at 25° C into the flask by means of a pipette, placing the tip of the pipette just beneath the surface of the alcohol. Make up a volume of 100 cc at 25° C with alcohol and mix thoroughly. By means of the same pipette transfer 10 cc of the alcoholic solution to a hard glass test-tube of 25 mm by 200 mm internal dimensions and containing a cooled mixture of 20 cc of distilled water and 5 cc of sulfuric acid. Connect the tube by means of a tin foil-covered stopper with a well-cooled condenser, the delivery tube of which dips beneath the surface of 50 cc of an alcoholic solution of potassium hydroxide (3 in 10) contained in a 300-cc flask, and heat gently until about 10 cc of distillate has been received. Then withdraw the delivery tube, rinse it with 5 cc of alcohol, and proceed as directed in the assay under *Spiritus Chloroformi* beginning with the words 'Connect the flask by means of a tin foil-covered stopper.' Each cc of tenth normal silver nitrate is equivalent to 0.00398 Gm of CHCl_3 .

Massa Hydrargyri—Honey replaces Honey of Rose.

Mistura Crete—U S P IX formula again accepted.

Compound Chalk Powder	20	Gm
Cinnamon Water	40	cc
Water to make	100	cc

Mucilago Acaciæ—An alternative formula is added permitting it to be made extemporaneously from powdered acacia, the usual practice in prescription filling

Pilulæ Ferri Carbonatis—The use of water has been eliminated from the original mixture

Suppositoria Glycerini—The formula has been changed as follows

Glycerin	92 Gm
Sodium Stearate	8 Gm
Distilled Water	<u>5 Gm</u>
To make about	30 rectal suppositories

Heat the glycerin in a porcelain dish, on a water-bath to about 95° C, add the sodium stearate and stir the mixture gently with a glass rod, retaining the specified temperature, until the sodium stearate is dissolved. Then add the distilled water, mix thoroughly, and immediately pour the hot liquid into suitable moulds. Remove the suppositories when they are completely cold and preserve them in tightly stoppered glass containers in a cool place.

NOTE If preferred the sodium stearate for Suppositories of Glycerin may be prepared during the making of the Suppositories by the direct reaction between stearic acid and sodium carbonate or sodium hydroxide, these being taken in correct proportion.

Toxibellæ Hydrargyri Chloridi Corrosivi—Two sizes of tablets are recognized

Small, to contain from 0.1125 to 0.1375 Gm of HgCl₂

Large, to contain from 0.45 to 0.55 Gm of HgCl₂

The tablets are to be of a distinctive color, not white, angular or irregular shape, not discolored. If for household use they are to be dispensed in glass containers of a distinctive angular shape having irregular or roughened sides or edges, red poison label on each package and also statement indicating the amount of mercury bichloride in each tablet.

Ointments—The following statement concerning Ointments is proposed for inclusion in the "Introductory Notices" of the new Pharmacopœia

"In the official ointments containing yellow or white wax or paraffin, as stiffening agents, the proportions of these and of the other fatty substances directed in the official formulas may be varied to maintain a suitable consistence under different climatic conditions, provided that the ratio of active ingredients to the total weight of the ointment remains the same and that the essential nature of the fatty vehicle is not materially changed."

Unguentum—Formula changed to

Wool Fat	5 Gm
White Wax	5 Gm
White Petrolatum	<u>90 Gm</u>
To make	100 Gm

Unguentum Acidi Borici—Formula changed and assay added

Boric Acid	10 Gm
White Wax	5 Gm
Wool Fat	5 Gm
White Petrolatum	<u>80 Gm</u>
To make	100 Gm

To contain not less than 9 per cent and not more than 11 per cent of H₂BO₃

Assay Place about 5 Gm of Boric Acid Ointment in a tared Erlenmeyer flask of suitable capacity and weigh accurately. Add about 30 cc of hot distilled water and heat for fifteen minutes on a water bath with frequent agitation. Filter while hot through a wetted filter into a 100-cc volumetric flask. Wash the flask several times with hot distilled water transferring the washings to the filter. When cool dilute the filtrate to exactly 100 cc. To exactly 20 cc of the filtrate, representing one-fifth of the weight of Boric Acid Ointment taken, add 20 cc of glycerin, previously neutralized to phenolphthalein T.S. Titrate with tenth normal sodium hydroxide using phenolphthalein T.S. as the indicator. Discharge the pink color by the addition

of 20 cc of glycerin, neutral to phenolphthalein T S and again titrate until the pink color reappears Each cc of tenth normal sodium hydroxide is equivalent to 0.006192 Gm of H_3BO_3

Unguentum Acidi Tannici —Formula changed to

Tannic Acid	20 Gm
Glycerin	20 Gm
Wool Fat	3 Gm
Yellow Wax	3 Gm
Petrolatum	74 Gm
To make	100 Gm

Unguentum Aquæ Rosæ —The stronger rose water is replaced with 50 cc of rose water, 140 cc of distilled water and 0.2 cc of oil of rose The ointment is to be preserved in pure tin collapsible tubes

Unguentum Belladonnæ —Formula changed to

Pilular Extract of Belladonna	10 Gm
Diluted Alcohol	5 cc
Wool Fat	5 Gm
Yellow Wax	5 Gm
Petrolatum	75 Gm
To make	100 Gm

A new rubric and assay appear elsewhere

Unguentum Chrysarobini —Formula changed to

Chrysarobin	6 Gm
Wool Fat	5 Gm
Yellow Wax	5 Gm
Chloroform	4 Gm
Liquid Petrolatum	6 Gm
Petrolatum	74 Gm
To make	100 Gm

Unguentum Gallæ —Formula changed to

Nutgall	20 Gm
Yellow Wax	5 Gm
Wool Fat	5 Gm
Petrolatum	70 Gm
To make	100 Gm

Unguentum Hydrargyri Ammoniatæ —Formula changed and assay added

Ammoniated Mercury	10 Gm
White Wax	5 Gm
Wool Fat	5 Gm
White Petrolatum	80 Gm
To make	100 Gm

Ammoniated Mercury Ointment contains an amount of ammoniated Mercury corresponding to not less than 7.1 per cent and not more than 8.7 per cent of Hg

Assay Place in a separator about 1.5 Gm of Ammoniated Mercury Ointment accurately weighed Warm it slightly to soften the ointment and while rotating add 50 cc of ether and then shake the mixture until the ointment base is dissolved Add 10 cc of a mixture of equal volumes of hydrochloric acid and distilled water and shake it vigorously until all of the Ammoniated Mercury has dissolved Filter the aqueous layer that separates into a 250-cc beaker and wash the remaining ethereal solution with several portions of 10 cc each of distilled water until the washings produce no turbidity with silver nitrate T S

Dilute the hydrochloric acid solution and the combined washings to about 150 cc and add 5 cc of hydrochloric acid. Saturate the solution with hydrogen sulfide gas and collect the precipitate in a tared Gooch crucible. Wash the precipitate successively with distilled water with two 10-cc portions of alcohol, two 10 cc portions of carbon tetrachloride, using no suction and finally wash with 10 cc of ether. Dry the crucible and contents to constant weight at 100° C. The weight of mercuric sulfide obtained, multiplied by 0.862 indicates the quantity of mercury represented by the ammoniated mercury in the Ointment taken for the assay.

Unguentum Hydrargyri Fortius —Formula changed

Mercury	500 Gm
Oleate of Mercury	20 Gm
Wool Fat	300 Gm
White Wax	50 Gm
Petrolatum	130 Gm
To make	1000 Gm

Unguentum Hydrargyri Mite —Formula changed to

Strong Mercurial Ointment	600 Gm
White Petrolatum	380 Gm
White Wax	20 Gm
To make	1000 Gm

Unguentum Hydrargyri Oxidi Flav —Formula changed and assay added

Yellow Mercuric Oxide	1 Gm
Liquid Petrolatum	1 Gm
Yellow Wax	5 Gm
Wool Fat	5 Gm
Petrolatum	88 Gm
To make	100 Gm

Yellow Mercuric Oxide Ointment contains not less than 0.9 per cent and not more than 1.1 per cent of HgO.

Assay Place in a separator about 10 Gm of Ointment of Yellow Mercuric Oxide accurately weighed. Warm it slightly to soften the ointment and while rotating add 50 cc of ether. Shake the mixture until the soluble portion is dissolved. Add 10 cc of a mixture of equal volumes of hydrochloric acid and distilled water and shake it vigorously until the mercuric oxide has dissolved. Filter the aqueous layer that separates into a 250 cc beaker and wash the remaining ethereal solution with several portions of 10 cc each of distilled water until the washings produce no turbidity with silver nitrate T.S. Dilute the hydrochloric acid solution and the combined washings with distilled water to about 150 cc and add 5 cc of hydrochloric acid. Saturate the solution with hydrogen sulfide gas and collect the precipitate in a tared Gooch crucible. Wash the precipitate successively with distilled water, two 10 cc portions of alcohol, two 10 cc portions of carbon tetrachloride without suction and finally with 10 cc of ether. Dry the crucible and contents to constant weight at 100° C. The weight of mercuric sulfide obtained, multiplied by 0.931 indicates the quantity of mercuric oxide in the Ointment taken for the assay.

Unguentum Iodi —Formula changed and assay added

Wool Fat changed to	5 Gm
Yellow Wax	5 Gm added
Petrolatum	70 Gm added

Iodine Ointment contains not less than 6.5 per cent and not more than 7.5 per cent of total I.

Assay Tare a nickel or silver crucible containing about 2 Gm of anhydrous potassium carbonate, add about 1 Gm of Iodine Ointment and reweigh. Cover the Ointment with an additional 2 Gm of potassium carbonate and heat on a water bath until the Ointment is fluid. Heat the crucible and contents gently over a Bunsen flame, gradually increasing the temperature.

but not exceeding a dull redness, until the Ointment is completely carbonized. Extract the residue with boiling distilled water and wash on a filter until the washings no longer produce a precipitate with silver nitrate T S after acidifying with nitric acid. Heat the combined filtrate and washings, which measure about 75 cc, on a water-bath, and add potassium permanganate T S until the hot liquid remains permanently pink. Add just enough alcohol to remove the pink tint, cool to 25° C, then add sufficient distilled water to make exactly 100 cc. Filter the mixture through a filter which has not been previously moistened, rejecting the first 25 cc of filtrate. To 50 cc of the subsequent clear filtrate add 10 cc sodium potassium iodide T S, acidify with diluted sulfuric acid and titrate with tenth normal sodium thiosulfate. Each cc of tenth-normal sodium thiosulfate is equivalent to 0.002115 Gm of iodine.

Unguentum Phenolis —Assay added

Phenol Ointment contains not less than 1.8 per cent and not more than 2.2 per cent of C_6H_5OH .

Assay Place about 2 Gm of Phenol Ointment in a tared 150 cc Florence flask and weigh accurately. Add 75 cc of distilled water and arrange the flask for steam distillation having connected it with a water chilled condenser. Distil with steam, collecting 150 cc of distillate in a 500-cc glass stoppered flask. 1 cc of the subsequent distillate should show no turbidity with 3 cc of bromine T S. Add exactly 50 cc of tenth-normal bromine and proceed with the assay as directed under *Phenol*, line beginning with the words 'then 5 cc'. Each cc of tenth normal bromine is equivalent to 0.001568 Gm of C_6H_5OH .

Unguentum Sulphuris —Formula changed and assay added

Precipitated Sulfur	15 Gm
Wool Fat	5 Gm
Yellow Wax	5 Gm
White Petrolatum	75 Gm
To make	100 Gm

Sulfur Ointment contains not less than 13.5 and not more than 16.5 per cent of S.

Assay Place about 0.5 Gm of Sulfur Ointment in a tared Erlenmeyer flask of suitable capacity and weigh accurately. Add 5 cc of nitric acid and 3 cc of bromine. Heat the mixture gently until the excess of bromine has been dissipated. Add about 50 cc of distilled water and transfer to a separator. Extract the liquid with three successive portions of ether of 30, 20 and 10 cc respectively, to remove the soluble ingredients. Wash the combined ethereal washings with about 10 cc of distilled water and add this to the aqueous solution. Dilute the solution to about 200 cc with distilled water and acidify with hydrochloric acid. Heat the mixture to boiling and add hot barium chloride T S in small portions, until no further precipitation takes place. Heat the mixture on a water-bath for thirty minutes, collect the precipitate on a filter wash, dry, ignite and weigh it as barium sulfate. The weight of barium sulfate thus obtained multiplied by 0.1373, indicates its equivalent of S.

Unguentum Zinc Oxidi —Formula changed and assay added

Zinc Oxide	20 Gm
Liquid Petrolatum	10 Gm
White Wax	5 Gm
Wool Fat	5 Gm
White Petrolatum	60 Gm
To make	100 Gm

Zinc Oxide Ointment contains not less than 19 per cent and not more than 21 per cent of ZnO.

Assay Weigh accurately in a tared porcelain dish about 2 Gm of Zinc Oxide Ointment, heat it slowly until melted and continue the heating, gradually raising the temperature until the mass is thoroughly charred. Cool break up the charred mass with a stout glass rod add 10 cc of distilled water and 5 cc hydrochloric acid and heat on the water-bath for one-half hour. Filter and wash the filter thoroughly with distilled water. Dilute the filtrate to 150 cc add ammonia T S until the precipitate first formed is redissolved and then pass hydrogen sulfide through the

mixture until the zinc is completely precipitated. After allowing it to stand for about one hour filter the precipitated zinc sulfide and wash it a few times with water containing a little ammonium sulfide. Dissolve the precipitate of zinc sulfide from the filter by pouring over the edges of the filter hot diluted hydrochloric acid in small portions at a time. Wash the filter thoroughly with small quantities of hot distilled water, receiving the filtrate and washings in a tared porcelain dish. Evaporate the filtrate on the water-bath to about 2 cc then add to it 3 Gm of yellow mercuric oxide, previously mixed with about 15 cc of distilled water. Evaporate the mixture to dryness and carefully ignite the residue under a hood to constant weight. The weight of the zinc oxide thus obtained, corrected for any non-volatile matter contained in 3 Gm of the mercuric oxide corresponds to not less than 19 per cent and to not more than 21 per cent of the weight of the Ointment taken for the assay.

REPORT ON THE UNITED STATES PHARMACOPŒIA ELEVENTH REVISION *

BY E. FULLERTON COOK, CHAIRMAN OF THE U. S. PHARMACOPŒIA COMMITTEE, ELEVENTH REVISION

The work of revision upon the U. S. P. XI of necessity must soon come to a conclusion if the new Pharmacopœia is to appear within a reasonable time. The galley proofs, after an exacting review by the members of the Revision Committee, and the insertion of many alterations, have been sent back to the printer for issuance as page proof. While it will be necessary to make a few additional changes, these cannot be of a drastic character, since page proof, when once made up does not permit of extensive revision.

This means that admissions and deletions are settled for this printing, although the Convention has authorized the admission of new titles, should this prove desirable, through the issuance of "Supplements."

The question of "Scope" always will be one of the major problems of the Revision. Members of the Sub-Committee responsible for these decisions have most earnestly and conscientiously studied this problem. Their deliberations cover about 500 pages of Bulletins, and, in a number of instances, they have called for information and advice from the Sub-Committee on Therapeutics, in which Committee's Bulletins will be found many more pages of discussion.

The Sub-Committee on Scope has proceeded on well-defined principles. Its objective has been, to include as official in the Pharmacopœia, a comprehensive and dependable list of therapeutic agents meeting most of the needs of the medical profession. Insulin will be a striking example of omission, for, though approved, it could not be admitted due to its control by patent. As soon as this expires it will promptly be admitted by the Supplement route.

The newly admitted substances are as follows:

ARTICLES ADDED TO THE U. S. P. XI

Acriflavina	Ephedrina
Acriflavinae Hydrochloridum	Ephedrinae Hydrochloridum
Æthylenum	Ephedrinae Sulfas
Æthylhydrocuprinae Hydrochloridum	Erythrol Tetranitrat
Æthylis Oxidum	Extractum Hepatis
Antitoxinum Scarlatinae Streptococcicum	Ferri et Ammonii Citrates Virides
Bismuthi et Potassii Tartras	Fluoresceinum Solubile
Calci Creosotas	Histaminæ Phosphas
Calci Gluconas	Hydrargyri Succinidum
Calci Hydroxidum	Iodophthaleinum Solubile
Carbo Activatus	Liquor Ergosterolis Irradiati
Carboni Dioxidum	Liquor Hepatis
Chlorobutanol	Liquor Hepatis Purificatus
Digitalis Pulverata	Liquor Histaminæ Phosphatis
Emulsum Petrolati Liquidum	Liquor Parathyroides

* Read at the 1935 A. P. H. A. meeting, Portland, Oregon.

Liquor Sodii Hypochloritis
 Merbaphenum
 Neocinchophenum
 Oleum Iodatum
 Oleum Maydis
 Oleum Morrhuæ Non Destearinatum
 Oleum Rosæ
 Phenacinae Hydrochloridum
 Phenobarbitalum Solubile
 Pulvis Chimofoni
 Serum Antimeningococcicum
 Serum Antipneumococcicum
 Sodii Perboras
 Sodii Stearas

Stomachus
 Tabellæ Glycerylis Trinitratis
 Theophyllina cum Æthylenediamina
 Theophyllina et Sodii Acetas
 Tinctura Iodi Mitis
 Toxicum Diphthericum Detoxicatum
 Toxicum Diphthericum Diagnosticum
 Toxicum Scarlatinae Streptococcicum
 Toxicitabellæ Hydrargyri Bichloridi Parvæ
 Tryparsamidum
 Tuberculinum Pristinum
 Vaccinum Rabies
 Vaccinum Typhosum
 Vaccinum Typhosum Paratyphosum

Interim Revisions—There has been an increasing recognition within the past few years that decennial revisions were not adequate for official standards, that the U S P policy of a ten-year change in the official requirements and scope greatly lessened the usefulness of the Pharmacopœia, and, in fact, established some standards which soon became inaccurate or incapable of enforcement due to advances in scientific knowledge

This was strikingly true of products standardized by biological methods in which field tremendous strides were being made, but other influences such as new legislation, increased Governmental enforcement, and the introduction of new therapeutic agents all combined to force the issuance of supplements which became known as "Interim Revision Announcements"

There can be little doubt that if the Pharmacopœia of the future is adequately to serve the medical and pharmaceutical professions and to provide correct standards for governmental enforcement, that this policy will have to be continued and perhaps extended. One suggestion has been the issuance of an "annual supplement" but only time can determine the form which added titles and revised standards shall take to most effectively meet the changing and developing need for standards in medicinal products

Fortunately the authority has been provided and the Revision Committee was prepared to meet the unusual situations of the past two years and thus prove that the revision machinery was sufficiently flexible and fully qualified to meet these new problems as they have arisen

Vitamin and Anti anemia Advisory Boards—Among recent problems has been the necessity for the Pharmacopœia to assist in establishing standards for important new medicinal products. Here again the unique position of the Pharmacopœia has been demonstrated

In the field of vitamins, the Committee by investigation has been able to bring into conference outstanding specialists in this field. The group includes those dealing with the subject as a pure science, mostly in University or Scientific Research, then the experts in Government laboratories, and, in addition, the technical experts associated with commercial organizations

This group, coming together under Pharmacopœial auspices, sitting about one table with their discussions reported in full and published, made it possible to establish a balanced judgment, eliminate special interests and reach wise decisions which ultimately were reflected in new U S P standards for Cod Liver Oil

To direct this program, the U S P Vitamin Advisory Board has been established, having as members Doctors Mendel Sherman and Nelson and a representative of the U S P Board of Trustees and of the Committee of Revision. This Board is now directing an extensive study, with 26 laboratories participating, into methods of assaying vitamin B₁. A recent necessity for pharmacopœial standardization has been the newly admitted preparations for the treatment of pernicious anemia. To meet this need a new Board of experts in this field is being established. This Board will announce methods of assay and will evaluate clinical reports upon products which have been given official recognition

Reference Standards—It has become necessary for pharmacopœial authorities to establish and distribute certain reference standards for use as a basis of comparison in assays. This becomes a new function for the Pharmacopœia, although a similar service was rendered by the Food and Drug Administration during the past decade

mixture until the zinc is completely precipitated After allowing it to stand for about one hour, filter the precipitated zinc sulfide and wash it a few times with water containing a little ammonium sulfide Dissolve the precipitate of zinc sulfide from the filter by pouring over the edges of the filter hot diluted hydrochloric acid in small portions at a time Wash the filter thoroughly with small quantities of hot distilled water, receiving the filtrate and washings in a tared porcelain dish Evaporate the filtrate on the water-bath to about 2 cc then add to it 3 Gm of yellow mercuric oxide, previously mixed with about 15 cc of distilled water Evaporate the mixture to dryness and carefully ignite the residue under a hood to constant weight The weight of the zinc oxide thus obtained, corrected for any non-volatile matter contained in 3 Gm of the mercuric oxide corresponds to not less than 19 per cent and to not more than 21 per cent of the weight of the Ointment taken for the assay

REPORT ON THE UNITED STATES PHARMACOPŒIA ELEVENTH REVISION *

BY E FULLERTON COOK CHAIRMAN OF THE U S PHARMACOPŒIA COMMITTEE, ELEVENTH REVISION

The work of revision upon the U S P XI of necessity must soon come to a conclusion if the new Pharmacopœia is to appear within a reasonable time The galley proofs, after an exacting review by the members of the Revision Committee, and the insertion of many alterations, have been sent back to the printer for issuance as page proof While it will be necessary to make a few additional changes, these cannot be of a drastic character, since page proof, when once made up does not permit of extensive revision

This means that admissions and deletions are settled for this printing, although the Convention has authorized the admission of new titles, should this prove desirable, through the issuance of 'Supplements'

The question of "Scope" always will be one of the major problems of the Revision Members of the Sub Committee responsible for these decisions have most earnestly and conscientiously studied this problem Their deliberations cover about 500 pages of Bulletins and, in a number of instances, they have called for information and advice from the Sub-Committee on Therapeutics in which Committee's Bulletins will be found many more pages of discussion

The Sub Committee on Scope has proceeded on well defined principles Its objective has been, to include as official in the Pharmacopœia, a comprehensive and dependable list of therapeutic agents meeting most of the needs of the medical profession Insulin will be a striking example of omission, for, though approved it could not be admitted due to its control by patent As soon as this expires, it will promptly be admitted by the Supplement route

The newly admitted substances are as follows

ARTICLES ADDED TO THE U S P XI

Acriflavina	Ephedrina
Acriflavinæ Hydrochloridum	Ephedrinæ Hydrochloridum
Æthylenum	Ephedrinæ Sulfas
Æthylhydrocuprinæ Hydrochloridum	Erythrol Tetranitrat
Æthylis Oxidum	Extractum Hepatis
Antitoxinum Scarlatinæ Streptococcicum	Ferri et Ammonii Citrates Virides
Bismuthi et Potassii Tartras	Fluoresceinum Solubile
Calci Creosotas	Histaminæ Phosphas
Calci Gluconas	Hydrargyri Succinimidum
Calci Hydroxidum	Iodophthaleinum Solubile
Carbo Activatus	Liquor Ergosterolis Irradiati
Carboni Dioxidum	Liquor Hepatis
Chlorobutanol	Liquor Hepatis Purificatus
Digitalis Pulverata	Liquor Histaminæ Phosphatis
Emulsum Petrolati Liquidum	Liquor Parathyroides

* Read at the 1935 A Ph A meeting Portland Oregon

Liquor Sodii Hypochloritis
 Merbaphenum
 Neocinchophenum
 Oleum Iodatum
 Oleum Maydis
 Oleum Morrhuæ Non-Destearinatum
 Oleum Rosæ
 Phenacainæ Hydrochloridum
 Phenobarbitalum Solubile
 Pulvis Chinioformi
 Serum Antimentingococcicum
 Serum Antipneumococcicum
 Sodii Perboras
 Sodii Stearas

Stomachus
 Tabellæ Glycerylis Trinitratis
 Theophyllina cum Æthylenediamina
 Theophyllina et Sodii Acetas
 Tinctura Iodii Mitis
 Toxinum Diphthericum Detoxicatum
 Toxinum Diphthericum Diagnosticum
 Toxinum Scarlatinae Streptococcicum
 Toxatellæ Hydrargyri Bichloridi Parvæ
 Tryparsamidum
 Tuberculinum Pristinum
 Vaccinum Rabies
 Vaccinum Typhosum
 Vaccinum Typhosum Paratyphosum

Interim Revisions—There has been an increasing recognition within the past few years that decennial revisions were not adequate for official standards, that the U S P policy of a ten-year change in the official requirements and scope greatly lessened the usefulness of the Pharmacopœia, and in fact, established some standards which soon became inaccurate or incapable of enforcement due to advances in scientific knowledge

This was strikingly true of products standardized by biological methods in which field tremendous strides were being made, but other influences such as new legislation, increased Governmental enforcement, and the introduction of new therapeutic agents all combined to force the issuance of supplements which became known as "Interim Revision Announcements"

There can be little doubt that if the Pharmacopœia of the future is adequately to serve the medical and pharmaceutical professions and to provide correct standards for governmental enforcement, that this policy will have to be continued and perhaps extended. One suggestion has been the issuance of an "annual supplement" but only time can determine the form which added titles and revised standards shall take to most effectively meet the changing and developing need for standards in medicinal products

Fortunately the authority has been provided and the Revision Committee was prepared to meet the unusual situations of the past two years and thus prove that the revision machinery was sufficiently flexible and fully qualified to meet these new problems as they have arisen

Vitamin and Anti-anemia Advisory Boards—Among recent problems has been the necessity for the Pharmacopœia to assist in establishing standards for important new medicinal products. Here again the unique position of the Pharmacopœia has been demonstrated

In the field of vitamins, the Committee by investigation has been able to bring into conference outstanding specialists in this field. The group includes those dealing with the subject as a pure science, mostly in University or Scientific Research, then the experts in Government laboratories and, in addition, the technical experts associated with commercial organizations

This group, coming together under Pharmacopœial auspices, sitting about one table with their discussions reported in full and published, made it possible to establish a balanced judgment eliminate special interests and reach wise decisions which ultimately were reflected in new U S P standards for Cod Liver Oil

To direct this program, the U S P Vitamin Advisory Board has been established having as members Doctors Mendel, Sherman and Nelson and a representative of the U S P Board of Trustees and of the Committee of Revision. This Board is now directing an extensive study with 26 laboratories participating, into methods of assaying vitamin B₁. A recent necessity for pharmacopœial standardization has been the newly admitted preparations for the treatment of pernicious anemia. To meet this need a new Board of experts in this field is being established. This Board will announce methods of assay and will evaluate clinical reports upon products which have been given official recognition

Reference Standards—It has become necessary for pharmacopœial authorities to establish and distribute certain reference standards for use as a basis of comparison in assays. This becomes a new function for the Pharmacopœia, although a similar service was rendered by the Food and Drug Administration during the past decade

Among the reference standards will be the "Reference Cod Liver Oil" of known vitamin A and vitamin D potency, expressed in U S P vitamin units, a "Reference Digitalis Powder" of known activity, expressed in terms of U S P digitalis units, a "Reference Pepsin," having a proteolytic activity equivalent to 3000 times its weight of egg albumen, also the standard for Ergot, Ergotamine Ethanesulfonate and perhaps several others

Digitalis—As already indicated, the potency of this drug and the two official preparations, the "Standardized Powder" and the "Tincture," will be expressed in terms of U S P digitalis units. This U S P unit is identical in potency with the International Digitalis Unit which is the activity of 0.1 Gm. of the International Standard Digitalis Powder. The potency of the official digitalis leaf shall be such that 0.1 Gm. shall possess an activity equivalent to not less than 1 U S P digitalis unit.

Under the title for this drug will be found the statement "When digitalis is prescribed, 'Digitalis Pulverata' is to be dispensed." Under the title "Digitalis Pulverata" or "Powdered Digitalis" it is required that 0.1 Gm. shall possess an activity equivalent to not less than 1 and not more than 1.1 U S P digitalis units when assayed as directed under the Tincture.

In the Tincture of Digitalis the potency of 1 cc. is to be the equivalent of not less than 1 and not more than 1.1 U S P digitalis units, in other words one-tenth of the strength of the powdered drug. And here will be found the details of the assay which retains the one hour frog method. While a 10 per cent range of potency is indicated in the statement of standards, in both the powder and the tincture, at the end of the assay a tolerance is provided which states that owing to many variable factors in the assay which makes it difficult for different operators to obtain identical results evidences of potency within 20 per cent above or 20 per cent below the standard are accepted.

The frog method of assay has been retained, since the Sub Committee was not convinced of the superiority of any other method. An extensive investigation has been started, however with clinical cooperation and to be participated in by the British Pharmacopœial Commission in which a number of methods of assay will be compared on preparations distributed by the pharmacopœial committee and the investigation will include a comparison of the various assay methods and clinical results from the use of digitalis preparations which have been aged. When this study is completed it is expected that we shall have reliable evidence on many of the controversial points in digitalis assay.

Ergot—Here again uncertainty prevails, notwithstanding the recent extensive studies concerning ergot constituents. Apparently no better assay than the cockscorn method for determining the fact that the Fluidextract is potent has been presented at least the present state of knowledge is such that the question is still in flux. The Fluidextract, however, is to be prepared from drug of prime quality by the Type C Method, without heat, and 1000 cc. is to be made from 1000 Gm. of drug. There is to be no subsequent adjustment of volume but the product must have a known minimum potency, per cubic centimeter, equivalent to that of not less than 0.5 mg. of ergotamine ethanesulfonate—but no upper limit.

Should a Fluidextract fail to meet this standard it would indicate a product which was not official even though it could be shown to possess some potency by another type of assay but which probably evaluated a different constituent.

Sulfur vs. Sulphur—Sulfur' or words derived from sulfur, such as sulfite, sulfate, thio sulfate, etc. all will be spelled with an 'f' in place of the 'ph' in the new Pharmacopœia.

Tincture of Ginger—Only recently it has been found practically necessary to omit Tincture of Ginger from the Pharmacopœia. This is due to the action by the Internal Revenue Bureau which places it in the same status as alcoholic liquors. As now regulated, this tincture can be prepared only by one holding a permit to make it and having a rectifier's license. It could then be sold and kept only in the original container which had the license number of the rectifier blown in the glass of the bottle.

Inasmuch as no rectifier has taken out a license to manufacture it, there is no legal Tincture of Ginger available to-day in the United States. Anyone having it in stock or making it by the official method is subject to severe penalties.

The Fluidextract will be retained and is directed in the formula for Aromatic Sulfuric Acid and will be available for therapeutic use when needed.

Distilled Water—Distilled Water' has replaced Water" in the formulas of the Pharma

copœia This is in conformity with the practice of practically all pharmacopœias of the world and was adopted only after a wide survey of the water supplies in many parts of the country indicated that the available water in many communities was unfit for use in medicinal products. This fact, of course, had been generally recognized and careful pharmacists and manufacturing pharmacists have long been using nothing but distilled water in medicinal solutions and preparations.

Activated Charcoal—U S P X Wood Charcoal is being replaced by an "Activated Charcoal" which is required by test to have adsorbent qualities of a high order to insure superior therapeutic efficiency. By one test a methylene blue solution must be decolorized by another test strychnine sulfate is adsorbed from solution while by a third test hydrogen sulfide gas is adsorbed. The U S P will state that when Carbo Ligni is prescribed Carbo Activatus may be dispensed.

Solution of Potassium Arsenite—Fowler's Solution has been modified so as to have only a slight alkalinity and the Compound Tincture of Lavender has been replaced by alcohol, thus making a colorless solution. This simplification of the formula is in harmony with scientific improvement. The old solution was simply an imitation of one of the oldest known proprietary medicines. The pharmacist and the doctor must, however, know of changes of this type as soon as possible.

Solution of Sodium Hypochlorite (4 Per Cent)—This solution has replaced Chlorinated Lime in the preparation of Dakin's Solution and also can be used advantageously as a disinfectant and deodorant in those cases where chlorinated lime was formerly employed.

A solution of this type is now widely used in the home and is readily available at small cost but usually under a trade marked name. It should now be made available under the official title.

Solution of Magnesium Citrate—The U S P IX formula has been adopted with 33 Gm of citric acid instead of 35 Gm. This reduction in acid is satisfactory when the Magnesium Carbonate used does not contain the equivalent of Magnesium Oxide in the maximum amount permitted. In fact, precipitation on long standing will occur unless the oxide equivalent is controlled at the lower limit. A note is introduced suggesting that for greater stability the amount of Magnesium Carbonate taken shall be the equivalent of 15 Gm of 39.2 per cent oxide. If the oxide equivalent of the carbonate is stated on the package, this adjustment is readily possible. Sterilization is also suggested as a means of improving the stability of the solution.

Variations Permitted—The new Pharmacopœia will specifically authorize variations in a few products. A blanket clause provides for the increase or decrease in the degree of consistency in ointments, but without altering the character or percentage of medication or the nature of the fatty vehicle. This is to meet varying climatic conditions.

In the Emulsions of Cod Liver Oil and of Liquid Petrolatum, other emulsifying agents are permitted provided the general character of the finished product is not changed.

In some cases as under Syrup of Ferrous Iodide, where there are standards, tests and assay, a formula is given but this is preceded by a statement, such as, "Syrup of Ferrous Iodide may be prepared by the following formula." This is in harmony with the principle that when adequate tests are provided for chemical substances, the chemical process may be varied if the resulting products are identical.

Color Standards—The permissible intensity of color in Cod Liver Oil and the degree of color permitted under many chemicals when subjected to the action of sulfuric acid, are now controlled by comparison with color standards. These color standards are those proposed by Professor Army and his associates many years ago and the various "matching fluids," as they are officially termed, are prepared by mixing specific proportions of standard colorimetric solutions of cobaltous chloride, ferric chloride and cupric sulfate. This is an important advance and removes the uncertainty of meaning always introduced by descriptive color terms for which there is no color standard.

Reagents—It will be of interest to chemists to know that the Pharmacopœia has elaborated many of the texts for reagents bringing them in most instances into harmony with standards established by the American Chemical Society.

Coöperation—The spirit of cooperation and the enormous amount of time consuming labor from members of the Revision Committee and also from volunteers is perhaps unparalleled in work of a similar character elsewhere.

It is this interest from members of the pharmaceutical and medical professions which makes possible so unique a program as that which established our Pharmacopœia and which now main-

tains its prestige among similar publications. The unselfish and scientific character of pharmacopœial work must be maintained if Pharmacy is to merit this rich heritage, and our generation must look well to the spirit with which we approach the forthcoming Pharmacopœial Convention. The eyes of the coöperating scientific world are upon us and we who love our profession must zealously guard the essential standards.

With the limited time allotted for this presentation it is possible to touch only a few outstanding features of the revision. Detailed changes, in abstract, in many departments are being published in the A. P. H. A. JOURNAL during the next two months and will provide an opportunity for many to obtain information concerning the changes.

THE TESTS FOR REDISTILLED WATER IN THE NATIONAL FORMULARY VI MONOGRAPH *

BY R. S. ADAMSON, R. K. SNYDER, E. N. GATHERCOAL

The tests in the N. F. VI monograph for redistilled water are as follows:

Tests for Purity—Evaporate 100 cc. of Redistilled Water to dryness on a water bath, and subsequently dry the residue in an oven to constant weight at 100° C. not more than 0.0005 Gm. of residue remains.

Separate portions of 10 cc. each of Redistilled Water are not affected by the addition of barium chloride T. S. (*sulfate*), silver nitrate T. S. (*chloride*), ammonium oxalate T. S. (*calcium*), hydrogen sulfide T. S. (*metals*).

Redistilled Water shows not more than a faint yellow color when 0.1 cc. of alkaline mercuric potassium iodide T. S. is added to a 100-cc. portion (*ammonia*).

Add 10 cc. of calcium hydroxide T. S. to 5 cc. of Redistilled Water. The mixture remains clear and transparent (*carbon dioxide*).

Heat 100 cc. of Redistilled Water to boiling, acidulate with 10 cc. of diluted sulfuric acid, and subsequently add 0.1 cc. of twentieth normal potassium permanganate. The color of the liquid is not completely destroyed by boiling for 10 minutes (*oxidizable substances*).

Test for Sterility—Follow the general methods given on pages 24 to 26 for the Testing of Ampul Solutions for Sterility. If the sample to be examined is in a bulk package, follow Section D: plant 10 fermentation tubes with 1 cc. of the sample in each. If growth appears in any of the fermentation tubes, the test may be repeated. If growth appears in any of the second lot of fermentation tubes, the water in the bulk package shall not be used in any product intended for parenteral use. If the sample to be examined is taken from ampuls, follow Section E; if growth appears in any of the fermentation tubes planted, the test may be repeated. If growth appears in any of the second lot of fermentation tubes planted, the whole lot of ampuls shall be discarded.

QUANTITY OF WATER REQUIRED FOR THE TESTS

Considerable objection has been raised to the use of a large quantity of Redistilled Water (when in ampuls) for making the tests for purity. In U. S. P. X, about 725 cc. of distilled water is required to make the purity tests. Therefore, in the redistilled water monograph, the 100 cc. quantities have been reduced to 10 cc. for the tests for *sulfate*, *chloride*, *calcium* and *metals*, and a 5-cc. quantity for *carbon dioxide*. The 100-cc. quantities are retained for determining the *residue*, *oxidizable impurities* and *ammonia*. This requires a total of 345 cc. of redistilled water.

THE TESTS FOR SALTS

A solution was prepared as follows:

Sodium Chloride	10 Gm
Sodium Sulfate anhydrous	10 Gm
Calcium Oxide	50 Gm

* Scientific Section A. P. H. A. Portland meeting, 1935.

Iron Nitrate	2 0 Gm
Copper Acetate	1 0 Gm
Stronger Ammonia Water	3 5 cc
Acetic Acid,	
Doubled Distilled water, each a sufficient quantity	
To make	1000 0 cc

Dissolve the salts and the oxide in 750 cc of the doubled distilled water with the aid of a little acetic acid, add the stronger ammonia water and then sufficient acetic acid to make slightly acid. Filter, and add enough of the double distilled water through the filter to make 1000 cc

Dilute 100 cc of the solution with double-distilled water to make 1000 cc and mix well

Dilute 50 cc of the dilution with double distilled water to make 500 cc and mix well

The final dilution contains 10 parts per million of non-volatile solids

Two 100-cc samples of the final dilution were evaporated to dryness. The residues weighed 0.0010 Gm and 0.0011 Gm

The qualitative tests were made by adding 1 cc of the test solution to 10 cc of the double-distilled water containing the 10 parts per million of added salts and to a "blank" of 10 cc of the double distilled water. Also, a few drops of nitric acid were added in the chloride test, and a few drops of hydrochloric acid in the sulfate test. Comparison was made between the "blank" and the "test" after the two mixtures had stood for five minutes or longer in cylindrical graduated tubes. The results were as follows

Test for	Redistilled Water	Redistilled Water with 10 Parts per Million of Added Salt
Chloride	Unaffected	Very slight cloudiness
Sulfate	Unaffected	Unaffected
Calcium	Unaffected	Cloudiness
Iron	Unaffected	Slight darkening
Copper	Unaffected	
Ammonia	Very light yellow	Light yellowish orange

These results were due to

Test for	Parts per Million							
	Present before T S Was Added		Present after T S Was Added		Solubility in Water *		Insoluble Residue	
Chloride	NaCl	1 00	AgCl	2 45	AgCl	1 52	AgCl	0 93
Sulfate	Na ₂ SO ₄	1 00	BaSO ₄	1 64	BaSO ₄	1 74	BaSO ₄	0 00
Calcium	CaO	5 00	CaC ₂ O ₄	11 55	CaC ₂ O ₄	5 54	CaC ₂ O ₄	6 01
Iron	Fe(NO ₃) ₃	2 00	FeS	0 64	FeS	8 9	FeS	0 00
Copper	Cu(C ₂ H ₃ O ₂) ₂ · H ₂ O	1 00	CuS	0 48	CuS	0 33	CuS	0 15
Ammonium Acetate	NH ₄ C ₂ H ₃ O ₂	4 50						

* 'Handbook of Chemistry and Physics,' 18th Edition, Charles D. Hodgman, Editor

These results indicate that if but 5 parts per million of chemical salts be present in the water, no one of them will appear in the qualitative tests unless it be predominant in the mixture of salts.

A similar set of tests made on 100-cc quantities of the same dilution of the solution of salts in water indicated almost the same results. In 50-cc Nessler tubes the cloudiness might be slightly more evident and in 100-cc Nessler tubes perhaps slightly more evident than in the 50-cc tubes.

THE TEST FOR OXIDIZABLE MATTER

The U. S. P. X uses 0.1 cc of tenth normal potassium permanganate to 100 cc of distilled water, and requires that the pink color shall not be entirely discharged.

tains its prestige among similar publications. The unselfish and scientific character of pharmacopœial work must be maintained if Pharmacy is to merit this rich heritage, and our generation must look well to the spirit with which we approach the forthcoming Pharmacopœial Convention. The eyes of the coöperating scientific world are upon us and we who love our profession must zealously guard the essential standards.

With the limited time allotted for this presentation it is possible to touch only a few outstanding features of the revision. Detailed changes in abstract, in many departments are being published in the A. P. H. A. JOURNAL during the next two months and will provide an opportunity for many to obtain information concerning the changes.

THE TESTS FOR REDISTILLED WATER IN THE NATIONAL FORMULARY VI MONOGRAPH *

BY R. S. ADAMSON, R. K. SNYDER, E. N. GATHERCOAL

The tests in the N. F. VI monograph for redistilled water are as follows:

Tests for Purity—Evaporate 100 cc. of Redistilled Water to dryness on a water bath and subsequently dry the residue in an oven to constant weight at 100° C. not more than 0.0005 Gm. of residue remains.

Separate portions of 10 cc. each of Redistilled Water are not affected by the addition of barium chloride T. S. (*sulfate*), silver nitrate T. S. (*chloride*), ammonium oxalate T. S. (*calcium*), hydrogen sulfide T. S. (*metals*).

Redistilled Water shows not more than a faint yellow color when 0.1 cc. of alkaline mercuric potassium iodide T. S. is added to a 100-cc. portion (*ammonia*).

Add 10 cc. of calcium hydroxide T. S. to 5 cc. of Redistilled Water; the mixture remains clear and transparent (*carbon dioxide*).

Heat 100 cc. of Redistilled Water to boiling, acidulate with 10 cc. of diluted sulfuric acid and subsequently add 0.1 cc. of twentieth normal potassium permanganate; the color of the liquid is not completely destroyed by boiling for 10 minutes (*oxidizable substances*).

Test for Sterility—Follow the general methods given on pages 24 to 26 for the Testing of Ampul Solutions for Sterility. If the sample to be examined is in a bulk package, follow Section D; plant 10 fermentation tubes with 1 cc. of the sample in each; if growth appears in any of the fermentation tubes, the test may be repeated. If growth appears in any of the second lot of fermentation tubes, the water in the bulk package shall not be used in any product intended for parenteral use. If the sample to be examined is taken from ampuls, follow Section E; if growth appears in any of the fermentation tubes planted, the test may be repeated. If growth appears in any of the second lot of fermentation tubes planted, the whole lot of ampuls shall be discarded.

QUANTITY OF WATER REQUIRED FOR THE TESTS

Considerable objection has been raised to the use of a large quantity of Redistilled Water (when in ampuls) for making the tests for purity. In U. S. P. X. about 725 cc. of distilled water is required to make the purity tests. Therefore in the redistilled water monograph the 100-cc. quantities have been reduced to 10 cc. for the tests for *sulfate*, *chloride*, *calcium* and *metals*, and a 5-cc. quantity for *carbon dioxide*. The 100-cc. quantities are retained for determining the *residue oxidizable impurities* and *ammonia*. This requires a total of 345 cc. of redistilled water.

THE TESTS FOR SALTS

A solution was prepared as follows:

Sodium Chloride	1.0 Gm
Sodium Sulfate anhydrous	1.0 Gm
Calcium Oxide	5.0 Gm

* Scientific Section A. P. H. A. Portland meeting 1935

Iron Nitrate	2 0 Gm
Copper Acetate	1 0 Gm
Stronger Ammonia Water	3 5 cc
Acetic Acid,	
Doubled Distilled water, each a sufficient quantity	
To make	1000 0 cc

Dissolve the salts and the oxide in 750 cc of the doubled distilled water with the aid of a little acetic acid, add the stronger ammonia water and then sufficient acetic acid to make slightly acid. Filter, and add enough of the double distilled water through the filter to make 1000 cc

Dilute 100 cc of the solution with double distilled water to make 1000 cc and mix well

Dilute 50 cc of the dilution with double distilled water to make 500 cc and mix well

The final dilution contains 10 parts per million of non-volatile solids

Two 100-cc samples of the final dilution were evaporated to dryness. The residues weighed 0.0010 Gm and 0.0011 Gm

The qualitative tests were made by adding 1 cc of the test solution to 10 cc of the double-distilled water containing the 10 parts per million of added salts and to a "blank" of 10 cc of the double distilled water. Also, a few drops of nitric acid were added in the chloride test, and a few drops of hydrochloric acid in the sulfate test. Comparison was made between the "blank" and the "test" after the two mixtures had stood for five minutes or longer in cylindrical graduated tubes. The results were as follows

Test for	Redistilled Water	Redistilled Water with 10 Parts per Million of Added Salt
Chloride	Unaffected	Very slight cloudiness
Sulfate	Unaffected	Unaffected
Calcium	Unaffected	Cloudiness
Iron	Unaffected	Slight darkening
Copper	Unaffected	
Ammonia	Very light yellow	Light yellowish orange

These results were due to

Parts per Million

Test for	Present before T S Was Added		Present after T S Was Added		Solubility in Water *		Insoluble Residue	
Chloride	NaCl	1 00	AgCl	2 45	AgCl	1 52	AgCl	0 93
Sulfate	Na ₂ SO ₄	1 00	BaSO ₄	1 64	BaSO ₄	1 74	BaSO ₄	0 00
Calcium	CaO	5 00	CaC O ₄	11 55	CaC O ₄	5 54	CaC O ₄	6 01
Iron	Fe(NO ₃) ₃	2 00	FeS	0 64	FeS	8 9	FeS	0 00
Copper	Cu(C ₂ H ₃ O ₂) ₂ H ₂ O	1 00	CuS	0 48	CuS	0 33	CuS	0 15
Ammonium	NH ₄ C-H ₃ O ₄	4 50						
Acetate								

* Handbook of Chemistry and Physics, 18th Edition, Charles D. Hodgman, Editor

These results indicate that if but 5 parts per million of chemical salts be present in the water, none of them will appear in the qualitative tests unless it be predominant in the mixture of salts.

A similar set of tests made on 100-cc quantities of the same dilution of the solution of salts in water indicated almost the same results. In 50-cc Nessler tubes the cloudiness might be slightly more evident and in 100-cc Nessler tubes perhaps slightly more evident than in the 50-cc tubes.

THE TEST FOR OXIDIZABLE MATTER

The U S P X uses 0.1 cc of tenth-normal potassium permanganate to 100 cc of distilled water and requires that the pink color shall not be entirely discharged.

Early in the work on ampuls, Dr E B Carter published an extensive investigation on pyrogens and claimed that one-tenth cc of *twentieth*-normal potassium permanganate was ample for this test (see last paragraph of the monograph on redistilled water)

The Joint Contact Committee of the Manufacturers' Associations recommended a modification of this test as follows

"To 100 cc of distilled water, add 10 cc of diluted sulfuric acid, and bring to a boil Add twentieth normal potassium permanganate until a faint pink color is obtained then add an additional 0.2 cc of twentieth-normal potassium permanganate Add a measured amount of the redistilled water being tested until the pink color is discharged, maintaining the solution at the boiling point throughout the test The quantity of this water required to completely discharge the pink color shall not be less than 100 cc (*oxidizable impurities*)"

After a rather extensive investigation by Raymond S Adamson, as reported below, it would seem as though there were several objections to the test for *oxidizable impurities* as presented by the Joint Contact Committee

1 The addition of $N/20$ $KMnO_4$ in appreciable quantity to the preliminary 100 cc of distilled water, introduces an excess of the reagent unless the distilled water be highly contaminated with oxidizable matter

2 The use of 0.2 cc of $N/20$ $KMnO_4$ introduces so much of the reagent that the test becomes very coarse A much decreased amount should be used to insure a reasonable sensitiveness

3 The quantity of redistilled water, added to the original 100 cc of distilled water and the reagents is so great that the color of the permanganate is lost by dilution rather than by a chemical reduction

4 It is a question whether a chemical test can be devised that is sufficiently delicate to detect dangerous quantities of bacteria and of their decomposition or metabolic products Mr Adamson's report indicates a possibility of distinguishing between the presence of 3 bacteria per cc as compared with 5 bacteria per cc To do this, he uses 0.5 cc of $N/1000$ $KMnO_4$ in 100 cc of redistilled water and determines the excess $KMnO_4$ by the use of KI T S and starch T S However, the reading of the test is such a delicate matter that it probably will not be acceptable to some workers It is estimated that one trillion small bacteria yield about 13 mg of protein, and that possibly 500 mg of $KMnO_4$ will be chemically reduced by 1 mg of bacterial protein Therefore, the infinitesimal amount of $KMnO_4$ (about 0.1 cc of $N/1,000,000$) reduced by 500 bacteria is almost too small to measure (0.1 cc of $N/10$ $KMnO_4$ requires about 50,000,000 small bacteria to reduce it)

The report by Mr Adamson is as follows

In the descriptions of these experiments, certain abbreviated forms are used as follows

H_2O = recently prepared double distilled water or such water sterilized within 2 hours after being prepared

H_2SO_4 = Diluted sulfuric acid, U S P

$KMnO_4$ = Potassium permanganate in the designated volumetric solution

Boil = Heated over a flame in a flask to boiling and kept gently boiling for 10 minutes

Experiment 1 —To 100 cc of ordinary distilled water, add 10 cc of H_2SO_4 and bring to a boil, then add 0.05 cc of $N/20$ $KMnO_4$ and boil A pink color remains It is evident, therefore that 0.05 cc of $N/20$ $KMnO_4$ added to a preliminary 100 cc of distilled water is an excess of the reagent unless the distilled water be badly contaminated with oxidizable matter

Experiment 2 —To 100 cc of boiling H_2O add 10 cc of H_2SO_4 and 0.2 cc of $N/20$ $KMnO_4$ and boil Maintain the solution at the boiling point, add a measured amount of tap water until the pink color is completely discharged Twenty cc of Chicago chlorinated tap water completely discharges the color after boiling for 2 minutes

Experiment 3 —To 100 cc of boiling H_2O add 10 cc of H_2SO_4 and 0.2 cc of $N/20$ $KMnO_4$ and boil a pronounced pink color remains

Experiment 4 —To 100 cc of boiling H_2O add 10 cc of H_2SO_4 and 0.1 cc of $N/20$ $KMnO_4$ and boil a distinct pink color remains

Experiment 5 —To 100 cc of boiling H_2O add 10 cc of H_2SO_4 and 0.1 cc of $N/20$ $KMnO_4$ and boil Add to the boiling solution a measured quantity of H_2O maintaining the solution at the boiling point At least 350 cc of the water is added before the pink color is no longer visible

Experiment 6 —To 100 cc of boiling H_2O add 10 cc of H_2SO_4 and 0.1 cc of $N/20$ $KMnO_4$

and boil Add to the boiling solution a measured quantity of H_2O containing 25,000 bacteria per cc Seventy cc of this bacterial suspension, or 1,750,000 bacteria are required to destroy the pink color

Experiment 7 —To 100 cc of boiling H_2O add 10 cc of H_2SO_4 and 0.1 cc of $N/100$ $KMnO_4$, and boil no pink color is visible Cool the solution, add 1 cc of potassium iodide T S and 2 cc of starch T S, and mix a distinct blue color is produced

Experiment 8 —To 300 cc of boiling H_2O add 10 cc of H_2SO_4 and 0.2 cc of $N/100$ $KMnO_4$, and boil no color is visible Cool the solution, add 1 cc of potassium iodide T S and 2 cc of starch T S, and mix a light pink color is produced which gradually darkens to a light purple

Experiment 9 —To 300 cc of boiling H_2O add 10 cc of H_2SO_4 but no $KMnO_4$, and boil the solution is colorless Cool the solution, add 1 cc of potassium iodide T S and 2 cc of starch T S, and mix no color is produced After standing one hour, some darkening occurs

Experiment 10 —To 300 cc of boiling H_2O containing 750,000 bacteria (2500 per cc), add 10 cc of H_2SO_4 and 0.2 cc of $N/100$ $KMnO_4$, and boil no color is visible Cool the solution, add 1 cc of potassium iodide T S and 2 cc of starch T S, and mix no color is produced immediately After standing one hour, the solution becomes darker

Experiment 11 —To 100 cc of boiling H_2O add 10 cc of H_2SO_4 and 0.5 cc of $N/1000$ $KMnO_4$, and boil Cool the solution, add 1 cc of potassium iodide T S and 2 cc of starch T S, and mix a slight purple pink color is produced

Experiment 12 —To 100 cc of boiling H_2O containing 250 bacteria (2.5 per cc) add 10 cc of H_2SO_4 and 0.5 cc of $N/1000$ $KMnO_4$, and boil Cool the solution, add 1 cc of potassium iodide T S and 2 cc of starch T S, and mix a faint pink color is produced immediately

Experiment 13 —To 100 cc of boiling H_2O containing 500 bacteria (5 per cc) add 10 cc of H_2SO_4 and 0.5 cc of $N/1000$ $KMnO_4$, and boil Cool the solution, add 1 cc of potassium iodide T S and 2 cc of starch T S and mix no color is produced immediately

The colors in these experiments are seen to best advantage by using Nessler tubes on a white background and looking down through the depth of the solution in the tube The bacteria used were *Bacillus Coli*

Instead of using starch T S to detect the presence of the iodine liberated by the excess of $KMnO_4$, chloroform may be used To the cool solution add 1 cc of potassium iodide T S and 5 cc of chloroform and mix The chloroform layer receives the iodine color varying from the faintest trace of pink to quite a pronounced iodine color

The presence of the excess $KMnO_4$ may also be detected by adding a few drops of diphenylamine T S to the solution after cooling The solution acquires a blue color, varying in depth according to the amount of $KMnO_4$ present

THE TESTS FOR BACTERIA PRESENT IN REDISTILLED WATER

A test for the sterility of the Water should be included among the tests for purity, and also a test for dead bacteria

As Redistilled Water is practically always intended for parenteral use, the presence of any bacteria either dead or alive, is objectionable, for their protein or their metabolic products may be toxic or anaphylactic when the Water is so used When it is considered that there are many natural spring waters that will show no living bacteria in at least 8 tests out of 10, we certainly should require Redistilled Water, prepared especially to show complete purity to be free from microbic contamination The test for sterility indicated at the beginning of this paper is satisfactory

A test for dead bacterial bodies can quite easily be carried out as follows

Centrifuge a measured quantity of the water, but not less than 10 cc in a suitable centrifuge tube at not less than 2500 revolutions per minute for 30 minutes Pour off the supernatant water and remove the last 0.1 to 0.2 cc from the tip of the tube with a capillary pipette, and place it as a drop upon a glass microscopic slide Rinse the tip of the tube and the pipette with a drop of Redistilled Water and add to the drop on the slide Evaporate the water from the drop on the slide fix the residue to the slide by heat, and stain it with a suitable bacterial stain Not more than five bacterial bodies per cc of water are present in the mount

ASSOCIATION BUSINESS

AD INTERIM BUSINESS OF THE COUNCIL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, 1935-1936

Office of the Secretary, 2215 Constitution Ave., Washington, D C

LETTER NO 2

September 5, 1935

To the Members of the Council

For the information of the new members of the Council it is stated that motions made by mail in the interim between meetings of the Council require no second See By-Laws of the ASSOCIATION, page \\\ and By Laws of the Council page \\\, YEAR BOOK Volume 22 Council Letters for the preceding years will be found in the JOURNAL The minutes of the First Meeting of the Council for 1935-1936 are being printed and will be mailed to members of the Council as soon as completed

17 *Committee on Library and Committee on Museum* The secretary reported at the fourth and final meeting of the Council for 1934-1935 that nominations had been received from only two members of the Council (see Council Letter No 13, page 331, No 16, page 512 item 88) and it was decided that these nominations be made a matter of business in the first Council Letter of 1935-1936 The members of the Council are, therefore, invited to submit nominations for these two Committees, under the following motion which was adopted by the Executive Committee and approved by the Council That a special Committee on Library and a special Committee on Museum be created by the Council, membership not to be limited to the Council and to be selected with special reference to their knowledge and experience, to study the development of the Library and Museum respectively and to submit plans with respect to each'

18 *Resignation of E Fullerton Cook as a Candidate for the Presidency* The following letter has been received from Professor Cook

"It was quite a surprise to me to read in the newspaper at Portland that I had been nominated as a candidate for Presidency of the A P H A I had not been consulted concerning this nomination

"While I am deeply appreciative of the honor and confidence which my colleagues have shown in offering this nomination, I find it necessary to request the withdrawal of my name as a candidate Other responsibilities which I have assumed and which must be carried through the next two or three years, would make it impossible—or at least very unwise—for me to even consider additional duties

'I would ask you therefore to place this request before the Council and have the necessary action taken to remove my name from the ballot "

(*Motion No 1*) *It is moved by Kelly that E Fullerton Cook's resignation be accepted and that his name be omitted from the official ballot as a candidate for the Presidency* A vote on this motion will be called for in about one week

19 *Sale and Exchange of Liberty Bonds* Under the Fourth and Final Call the following Fourth Liberty Loan 4 1/4% Bonds 1933-1938 in the funds named have been called for payment on October 15 1935, after which date interest ceases

ENDOWMENT FUND

Reg 364524	\$ 1000 00
Cou D00769334	1000 00

CENTENNIAL FUND

Reg 1588S3 1588S4	2000 00
-------------------	---------

LIFE MEMBERSHIP FUND

Cou C00681373 C00207763 C01626073	6100 00
-----------------------------------	---------

RESEARCH FUND

Reg 174603, 174604	2000 00
Cou C02916173, C00574423, C02916193, C02067903, D00332224	5000 00

PROCTER MONUMENT FUND

Cou C04140753, D04140754	200 00
--------------------------	--------

REMINGTON HONOR MEDAL FUND

Cou D04147934	100 00
---------------	--------

Fourth Call	\$17,400 00
-------------	-------------

The holders are offered the options of payment in cash or of exchange at par for 10-12-year 2 $\frac{3}{4}$ % Treasury Bonds of 1945-1947. These bonds are not callable before maturity and will be dated September 16, 1935, interest payable on March 15th and September 15th. The right is reserved to increase the price above par by notice after September 10, 1935. The bonds called on March 15, 1935, were exchanged for U S Treasury Bonds 2 $\frac{7}{8}$ %, 1955-1960, at par (see Council Letters No 14, pages 426 and 427, and No 16, page 511).

Chairman Philip of the Committee on Finance writes

"With reference to the Fourth Call for Liberty Bonds and the options offered to holders of these bonds, I recommend with the concurrence of Treasurer Holton that those called be exchanged at par for the 10-12-year 2 $\frac{3}{4}$ % Treasury Bonds 1945-1947, and so move. It is unfortunate that the third member of the Committee on Finance, Dr LaWall, is ill. However it will be recalled that he favored the exchange of the bonds called on March 15, 1935, for U S Treasury Bonds 2 $\frac{7}{8}$ %, 1955-1960. I wish to repeat the opinion expressed at that time, that a higher rate of interest, while desirable, should not deter us from considering the greater safety of the Treasury Bonds, and that security of principal during these trying times for money entrusted to our care, is the first and most important consideration."

(Motion No 2) It is moved by Philip, as Chairman of the Committee on Finance, that the Fourth Liberty Loan Bonds listed above be sold and the proceeds be invested in 10-12-year 2 $\frac{3}{4}$ % Treasury Bonds, 1945-1947, or that the bonds be exchanged on an even basis, and that since some of the called bonds are registered, and at this time is required, the following be re adopted (see Council Letter No 14 page 427)

Resolved, that C W Holton, treasurer and E F Kelly secretary, are hereby authorized to buy, sell deal in, assign or negotiate the called Fourth Liberty Loan Bonds which are owned by, or registered in the name of the American Pharmaceutical Association and to that end, to endorse transfer and deliver the same

By direction of the chairman of the Council, a vote on the motion is called for at this time as the exchange should be made by September 10th

E F KELLY, Secretary

 RED CROSS ROLL CALL—NOVEMBER 11, 1928

Red Cross service is as wide as humanity's ills meeting all manner of distress on the basis of individual and community need. Its twofold programs of cure and prevention range in scope from ministering to victims of disasters to teaching how to bandage a cut finger. There is scarcely a situation of human suffering which the Red Cross is not called upon to meet. *The Red Cross extends the annual invitation to make its service possible*

THE EIGHTY-THIRD ANNUAL MEETING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, PORTLAND, OREGON, AUGUST 5-10, 1935

ABSTRACTS OF THE MINUTES OF THE GENERAL SESSIONS

Sessions of the Eighty-Third Annual Meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION were held in Multnomah Hotel, Portland, Ore. A list of members in attendance may be found on pages 679 and 680 of the August JOURNAL.

Some of the Committee Reports referred to in the proceedings have been printed in the Council Minutes, pages 681, *et seq* or elsewhere in the August issue, some are included in this number or will be printed in later issues of the JOURNAL under "Committee Reports" or under 'Addresses'.

FIRST GENERAL SESSION

The First General Session of the Eighty-Third Annual Meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION was called to order by President Robert P. Fischelis in the Main Ball Room of Multnomah Hotel August 7th, at 9:00 A.M. The following former presidents of the AMERICAN PHARMACEUTICAL ASSOCIATION were in attendance (In order of seniority) James H. Beal, E. G. Eberle, W. B. Day, F. J. Wulling, S. L. Hilton, H. V. Arny, L. L. Walton, T. J. Bradley, C. W. Johnson, H. C. Christensen, W. D. Adams, R. L. Swain.

President Fischelis said that it was hoped to have Bishop William Procter Remington, son of one of the distinguished former presidents in attendance. He stated that the former is Episcopal Bishop of Eastern Oregon and read a letter he received from him.

I deeply regret my inability to accept the very kind invitation of the AMERICAN PHARMACEUTICAL ASSOCIATION to attend the Convention to be held in Portland, August 5th-10th. Only my need of a real holiday this summer prevents my taking part in your proceedings. May I take this opportunity of extending greetings to an ASSOCIATION which engaged so much of my father's interest? His life work was Pharmacy and to it he gave the best years of his life in teaching and in writing the text-books which bore his name. I always felt that my father's devotion to his work had more in it than a mere interest in the cure of bodily ills through the scientific administration of drugs. It was the human element, the personal relationship with his many students, their ethical standards and their professional attitudes which engaged his best gifts.

He died ten days before I was consecrated a Bishop in the Episcopal church. It was a disappointment I know to him that none of his three sons followed in his footsteps. However, his work and mine are essentially the same. There is no separation between the ministering of healing to the sick bodies of people and the direct cure of those ills which lie embedded in their maladjustments to life. If I could bring you a message from him at this time I think it would be this: When you dispense drugs, send out with them a new stream of life, courage to the disheartened, new hope to the sick and a charity which may not bring you greater riches but will make a better world.

Wm. P. Remington,
Bishop of Eastern Oregon."

On request of President Fischelis, Secretary Kelly read the following:

From Dr. George Urdang, honorary member of the AMERICAN PHARMACEUTICAL ASSOCIATION, Berlin—

For the Eighty-Third Annual Meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION, I send my best wishes and my regards to all participants.

I regret it very much that I cannot take part in it. But I hope I shall

be possible for me, in one of the next years, to visit the states and then, naturally, I shall try to come to your meeting

"May all your work promote the progress of American Pharmacy and the welfare of their members "

From Secretary W Gnerich Retail Druggists Association, San Francisco—

"Greetings and best wishes from the Northern California Retail Druggists Association for a successful convention All druggists returning via San Francisco are invited to attend verteran druggists' luncheon on Monday, August 12th, at Stewart Hotel, San Francisco "

Secretary Kelly advised that greetings had also been received from the following Minnie and David C Whitney Kansas City, Mo , K B Bowerman, San Francisco, Cal , Robert W Bohmansson, Eureka, Cal , Mr and Mrs J C Peacock, Philadelphia, Pa , Edward W Runyon, San Francisco Cal , Frank L Grennie New York, N Y

A communication from the Ladies Auxiliary of the North Dakota Pharmaceutical Association, Fargo, North Dakota, follows

"Please convey to incoming President Pat Costello congratulations and best wishes for a most successful year "

President Fischelis remarked that these communications are much appreciated and that due acknowledgment will be made He said that in opening the convention he had used a gavel presented to the ASSOCIATION by Mr Jacobs some years ago The gavel was made of wood taken from the home of Dr Crawford Long who first used ether for anaesthesia

Another gavel was presented to him personally made from wood of a tree planted by Richard Stockton He was one of the signers of the Declaration of Independence from New Jersey "These gavels," he said, 'supply a sound historical background "

President Fischelis then introduced the former presidents of the ASSOCIATION (listed in opening paragraphs) He also introduced President Harvey Henry, of the N A R D , and invited him to a seat on the platform

E G Eberle thought it would be opportune to send a telegram of good wishes to the senior former president John Uri Lloyd President Fischelis said 'Without putting it to a vote I will ask the secretary to convey our respects and greetings to him "

President Fischelis asked for a motion, instructing the secretary to send a telegram of greeting to the Canadian Pharmaceutical Association Convention now in session in Vancouver, B C

A motion was accordingly made and carried

On request of President Fischelis the annual report of the House of Delegates was read by Chairman Rowland Jones On motion duly made and voted the report was accepted

President Fischelis requested Secretary Kelly to present an item of unfinished business The secretary stated 'It will be recalled that President Swain last year in his annual address recommended that the By Laws of the ASSOCIATION be amended to provide that the immediate past president should serve as a member of the Council for the year succeeding Also that at the last annual meeting a motion to so amend the By-Laws as to make this recommendation effective was presented I will so move " It was seconded from the floor

President Fischelis explained "It is moved by E F Kelly that Article I of Chapter III of the By-Laws be amended by the insertion of the words 'the immediate Past-President' following the words The President' in line three (3) with the object that the retiring president shall be an ex-officio member of the Council for the year following his term as president " He presented the motion to adopt and it was carried by vote

President Fischelis then turned the meeting over to First Vice-President George D Beal, who said "We will now listen to the reading of the President's address by R P Fischelis, President of the AMERICAN PHARMACEUTICAL ASSOCIATION "

President Fischelis in his introductory remarks stated "We have had a busy year Secretary Kelly and I were busy in Washu gton with a number of things that came up in connection with legislative and other contacts with the Government, so that much of what I have to say to

you this morning covers some of these last-minute activities and some of it had to be prepared at the last minute. Naturally in reporting the activities of a year we are inclined to report them rather fully and I shall take the liberty this morning of paraphrasing some parts of what will appear later in print, to save your time and not try your patience too greatly."

President Fischelis thereupon read the annual address, including seventeen (17) recommendations which he submitted as a part of the address on which action could be taken in detail, later in the meetings.

Chairman Beal said that President Fischelis' interesting and constructive address is by rule referred to the Committee on Resolutions of the House of Delegates (see pages 635-655 August JOURNAL).

President Fischelis resumed the Chair and thanked Vice-President Beal.

There being no New Business President Fischelis, owing to the absence of Chairman H A B Dunning, requested Secretary Kelly to present the Report of the Committee on Maintenance. Secretary Kelly, before reading the report, stated:

"I was requested by Dr. Dunning to express his regret at his inability to attend in person and give you a somewhat more definite report of the work of the Committee. You realize, of course, that if we attempt to deal with the work of the Committee it would take up a great deal of time. It is the hope of Dr. Dunning that the report will indicate to you the sincere effort being made by the Committee to cooperate."

Secretary Kelly thereupon read the report as follows:

REPORT OF THE COMMITTEE ON MAINTENANCE AMERICAN PHARMACEUTICAL ASSOCIATION

It will be recalled that at the last annual meeting, President Swain recommended that the Committees on Headquarters Building, on Site and on Plans be discontinued since the work of these committees was practically completed with the dedication of the American Institute of Pharmacy and that a Committee on Maintenance be provided to accumulate a maintenance fund both of which recommendations were approved.

Later, President Fischelis appointed H A B Dunning, Baltimore, Md, E F Kelly, Washington D C, R L Swain, Baltimore Md, S L Hilton, Washington D C, and R P Fischelis, Trenton N J, as members of this Committee with the writer as its *Chairman*. In the meantime, however, invitations to subscribe to the fund had been issued in letters and in an open letter addressed to the pharmacists of the country. Although the response has not been as satisfactory as we had hoped for, we are pleased to report the following, and it should be explained that the accounts of the Headquarters Building Fund and the Maintenance Fund are being kept separately.

Three new subscriptions amounting to \$135.00 and several payments amounting to \$160.00 have been received for the Headquarters Building Fund.

The subscriptions to the Maintenance Fund total \$132,036.00 of which \$50,000.00 represents a bequest to be paid later, leaving a difference of \$82,036.00. Of this latter amount \$64,436.00 has been paid.

At the time it was dedicated, there was approximately \$40,000.00 due on the building, the grounds, the furniture and the fixtures. All of this has been paid, with the exception of approximately \$1000.00 due on planting and the balance on hand in the Maryland Trust Company amounts to \$14,844.56.

The only other obligation against the project is the mortgage of \$36,400.00 held by the George Washington University on account of the lot in the rear, which we were obliged to purchase in order to obtain the necessary frontage for the building. This obligation can be reduced from time to time and is amply protected by the bequest of \$50,000.00 above mentioned.

The operating expenses of the building are very moderate and, with the exemption from taxes recently granted, there appears to be no reason why the expenses should be materially increased even when the Building is fully occupied.

It is important to bear in mind that the exemption from taxes shall continue so long as the property is used for its present purposes and that occupancy of the Building is limited by the act of Congress to those organizations and institutions serving American pharmacy on a non-profit basis. It seems quite correct to say that, with the exemption from taxes, the plans we originally

had in mind have been carried out and that the American Institute of Pharmacy is on a sound financial basis and does not represent, in any sense, a threat to the security and safety of our ASSOCIATION

Substantial progress has been made in developing the Library and Museum and it must be evident that the basic work required to collect and place the material at hand has taken much time and effort. Additional funds must be secured to develop these important features of the Institute and it is the purpose of the Committee to continue its efforts in this direction. Contributions of materials are solicited as well as money.

Nothing can be announced about the Research Laboratory at present. When the revisions of our books of standards are completed in the near future, the plans for a laboratory will be taken up with the expectation that it can be developed in keeping with our requirements.

In addition to the subscriptions above referred to, a number of gifts have been made, of which the following are the more important.

The School of Pharmacy, University of Minnesota, presented a valuable exhibit consisting of photographs of the plant gardens and milling equipment of the School and of the medicinal plants grown and prepared therein. The photographs are handsomely mounted in a display stand and have interested many visitors as illustrating an important pharmaceutical activity not generally known to the public. This type of educational exhibit is very helpful—and it is hoped that each school and college will present an exhibit illustrating some outstanding activity of the institution.

Mr and Mrs J C Peacock, both of whom are life members of the ASSOCIATION, have presented through President Fischelis—a complete projection apparatus for the meeting room which is a valuable addition to our equipment. Several medical and scientific organizations have met in the building and the contacts thus established will be beneficial.

The District of Columbia Pharmaceutical Association recently presented a fund of \$250.00 for a special purpose which has not yet been worked out.

The National Association of Boards of Pharmacy contributed a set of its proceedings. Mr O U Sisson, an enlarged photograph of 'The Laboratory.'

Miss Esther Barney, a framed and colored picture of the Pharmacy Exhibit at the Century of Progress, Mrs True and Mrs Holton, a counter scale and other equipment from the original Sharp and Dohme retail pharmacy as well as a number of photographs, Mrs Harvey A Wiley, a number of books and pamphlets from the library of her late husband.

A number of other interesting and valuable gifts might be mentioned but those referred to will illustrate that interest is being taken and no doubt the number and the scope of contributions will increase as the Institute and its purpose becomes better understood.

Reference should be made to the many visitors to the building—no particular effort has been made to invite visitors because the library and museum were being organized. However, the number of visitors, pharmacists and those connected with the drug industry as well as members of the other public health professions, government officials and layman, is steadily increasing. They come from every section of the country and from many foreign countries. Their comments indicate that the impression created by the building, the location, and the purposes for which the Institute is intended is favorable for pharmacy.

It is difficult to estimate the practical value of the Institute when it is developed and occupied as planned and when it can be thrown open to visitors for certain hours each day. The bureau which conducts the thousands of high school students who annually visit Washington has requested to be advised when our building may be added to the list of institutions to be inspected.

The Committee wishes to record its appreciation of the support given the project during the year and to again invite continued cooperation.

Respectfully submitted,

H A B DUNNING, *Chairman*

Secretary Kelly concluded: "President Fischelis, Dr Dunning has also asked me to briefly refer to two developments in our immediate neighborhood which it is felt will interest members here, and will indicate our favorable position in the city of Washington, and that we were fortunate in securing our location in the Capitol City at the time we did."

Secretary Kelly thereupon gave a brief report of the two developments in question, and at

the conclusion of his remarks informed President Fischelis that "Dr Dunning asked me to express his greetings to all in attendance "

The references were (1) That the site between Twentieth and Twenty First Streets has been allocated to the Federal Reserve Bank which will erect thereon, beginning this fall a building for its headquarters This site is the only one facing on Constitution Avenue which had not been allocated, (2) most tentative plans for the development of the area to the rear of our site have been published and indicate that this area will be developed in keeping with this important section of the Capitol City

President Fischelis referred to the fine report on the headquarters building

A motion was made by H W Youngken seconded by Mr Frank Mortensen, that the report be received for publication —Carried by vote

The secretary also referred to the plans of the Landmarks Society of Alexandria Va, for the restoration of the building occupied by the Stabler Leadbeater Apothecary Shop since its founding in 1792 The equipment stock, records etc of this pharmacy are owned by the AMERICAN PHARMACEUTICAL ASSOCIATION and will be housed in the restored building as a museum Reference was also made to the exhibition of materials from this pharmacy in the lobby of the hotel

President Fischelis introduced Dr Joseph A Pettit, who delivered an address on "The Practical Value to the Pharmacists of the Activities of the Council on Pharmacy and Chemistry of the American Medical Association " (Copy of the address is to be supplied by Dr Pettit for publication in a later issue of the JOURNAL)

President Fischelis thanked Dr Pettit for his very interesting discussion of the work of the Council

President Fischelis introduced Dr P T Meany of the North Pacific College, Portland who delivered an address on Dentistry and Pharmacy "

Dr Meany prefaced his address by saying that he was interested in pharmacy In 1900 he contributed to the collection of cascara bark (The address is to be published in a later issue of the JOURNAL)

President Fischelis thanked Dr Meany and expressed appreciation of the coöperation existing between dentistry and pharmacy

On motion, duly seconded, the first General Session was then adjourned

SECOND GENERAL SESSION

The Second General Session of the AMERICAN PHARMACEUTICAL ASSOCIATION was convened in Multnomah Hotel Thursday August 8th at 2 00 P M by President Robert P Fischelis He called for the reading of the minutes of the First General Session these were read by Secretary Kelly and by motion duly seconded and a vote they were approved (These minutes are printed in this issue of the JOURNAL) Secretary Kelly read a communication from Secretary John W Dargavel of the National Association of Retail Druggists it follows

Regret that circumstances beyond my control prevent my attendance at meeting of AMERICAN PHARMACEUTICAL ASSOCIATION Please convey my best wishes for a most successful and constructive meeting and also the appreciation of National Association of Retail Druggists for splendid cooperation and help you have given during past year for benefit of commercial pharmacy It has been a pleasure to work with you and I am sure there is a much better understanding between the two associations than there has been in past years Please be assured that we will do everything possible to see that this feeling is strengthened We are cognizant of the fact that by working together the two associations can be of mutual benefit "

President Fischelis expressed the pleasure of the ASSOCIATION and stated it would take the usual course

The report of the House of Delegates was read by Chairman Rowland Jones and it was approved on motion duly seconded and a vote

An address ' The Pharmacopœia of the United States and the Federal Food and Drugs Act ' as presented by James H Beal

President Fischelis referred to the fine presentation and asked for discussion of the address, if desired

There was no discussion and on motion of F H Freericks and seconded by Henry F Hein, the address was accepted for publication (It appears in this issue of the JOURNAL)

Local Secretary A O Mickelsen made announcements relative to the entertainment programs

The report of the Special Committee on The Council on "Pharmaceutical Practice," was presented by Chairman E Fullerton Cook, it follows

REPORT ON THE PROPOSED COUNCIL ON PHARMACEUTICAL PRACTICE ¹

At the last meeting of this ASSOCIATION, in the General Session, an opportunity was given for the discussion of a suggestion that the AMERICAN PHARMACEUTICAL ASSOCIATION establish a unit to actively operate in the national field of professional pharmacy both as an inspirational and an evaluating body

After the discussion a Committee of the ASSOCIATION was appointed to give the proposal further study and to report directly to the AMERICAN PHARMACEUTICAL ASSOCIATION Council After considerable correspondence the members of this Committee met at the headquarters building in Washington, reviewed the plans outlined a tentative program and submitted their suggestions to the A PH A Council

The Council subsequently passed the following resolution

"The A PH A Council approves the establishment of a Council on Pharmaceutical Practice to be conducted under the auspices of the AMERICAN PHARMACEUTICAL ASSOCIATION with personnel as recommended by the Special Committee, and the Special Committee is continued for the purpose of developing the plan in conjunction with the Council on Pharmaceutical Practice to report at the Portland Meeting "

The first step has therefore been taken toward the development of a plan of far-reaching significance to American pharmacy, and the Council of this ASSOCIATION is on record as approving the establishment of this new Council

Various members of the Special Committee were assigned specific phases of the question for further study and their reports have been reviewed and the whole question further discussed since reaching Portland this week

The Committee has decided at this time to submit only a tentative report, outlining the general proposal and invite further discussion and suggestions from the pharmacists and physicians of the Country

If the suggestions are approved and a practical plan for its operation can be developed, the "Council on Pharmaceutical Practice" can be organized and its program started It is recognized that to effectively operate the machinery of this organization many difficulties will have to be overcome and an effective executive force established The questions now to decide are whether such a body is needed, whether the AMERICAN PHARMACEUTICAL ASSOCIATION is in a position to effectively handle it and whether the pharmacists of America will support it

But the tentative plan must be given before these questions can even be discussed It will be understood, of course, that whatever cannot be outlined is subject to modification and that it is offered as a basis of discussion, but that it does carry the basic principles of such an organization

The Tentative Plan—Objectives—To develop and improve the practice of professional pharmacy in the United States in at least three divisions, *z e* (1) among retail pharmacists in community practice, (2) in hospital pharmacy, and (3) in pharmacy in Government services

Title of the Directing Body—"The Council on Pharmaceutical Practice "

Representatives on This Council—The Executive Body

A Pharmacist in retail service

A Hospital pharmacist

A pharmacist in Government service

¹ Presented at Portland, A PH A meeting, August 1935

The Chairman of the U S P Revision Committee
 The Chairman of the N F Revision Committee
 A representative of the American Association of Colleges of Pharmacy
 A representative of the National Association of Boards of Pharmacy
 The A P H A President *ex-officio*
 The A P H A Secretary *ex-officio*
 A full time director

In addition to the executive body it is also recommended that one representative from each of the following organizations be invited to participate solely in an advisory capacity, in some of the conferences of the Council

The American Medical Association
 The American College of Surgeons
 The American College of Physicians
 The American Dental Association
 The American Nurses Association
 The American Hospital Association
 The National Association of Retail Druggists
 The American Drug Manufacturers Association
 The Food and Drug Administration
 The Surgeon General of the Public Health Service
 The Surgeon General of the Army
 The Surgeon General of the Navy

The significance of conferences with representatives of these groups is evident. The pharmacist in the hospital must become a part of the medical service and cooperate effectively with the other professional divisions of the hospital. The same is true of the medical departments of the Army, the Navy, the Veteran's Bureau and the Public Health Service.

The standards and duties of the pharmacist in government departments must be developed in consultation with the medical groups if the pharmacist is to render efficient and effective service.

The pharmacist in community life has duties in a wider latitude of operations but the specific phase of his pharmaceutical service, with which this Council is concerned, is that which brings him into close affiliation with the medical and dental professions and provides in this field the opportunity to supply an important and necessary link in the maintenance of health.

There have been repeated evidences that the public is interested in this problem. Individual members of the medical profession and organized medical groups are asking that there may be some indication whereby they can be guided in the selection of pharmaceutical service. Naturally they turn to the AMERICAN PHARMACEUTICAL ASSOCIATION as a material organization established for the purpose of promoting professional pharmacy.

The Functioning of the Council—It is likely that there would first be a thorough study of the present needs in each of these fields of activity followed by an intensive educational program. While basically the same knowledge is needed in all three divisions the detailed plans and their application will have to be different in each group.

These preliminary studies leading to the development of an approved program and the winning of the enthusiastic support of the associated professions must precede what it is believed will ultimately be its most significant feature, namely, the offering of an opportunity to pharmacies and pharmacists in community service to register with this National Council, thus establishing their status as professional pharmacists before the community and medical profession.

The basic principle will have to be voluntary registration. Pharmacists who have demonstrated their interest in professional pharmacy by establishing pharmacies well equipped to perform the many duties presenting themselves in this field who are maintaining the professional standards as evidenced by their own practices and consequently have the confidence of members of the medical and dental professions and of the public should have no difficulty in demonstrating these facts and of receiving recognition.

Naturally those who take this step will benefit in many ways and the AMERICAN PHARMA

CEUTICAL ASSOCIATION will be performing a service to pharmacy, to medicine and especially to the public through improved medical service

If this plan is approved the details will have to be developed and a full time director of the program, with suitable secretarial help, will be a necessary feature. The issuance of the many professional helps to those registered with the Council and especially the conduct of the organization needed to check for approval those pharmacies and pharmacists applying for registration, make this a necessity

Discussion of the proposal is invited and it is recommended that the A P H A Council approve the continuance of this committee to further study the plan before any effort is made to start any of its functions

The Committee,

H V Army	E N Gathercoal	R P Fischelis	Edward Spease
C B Jordan	E F Kelly	Robert L Swain	Robert R Gaw
E Fullerton Cook, <i>Chairman</i>			

President Fischelis said "This report is now before you. The Council on Pharmaceutical Practice has been studying this subject for the past year. I know that many of you must be interested in what they are trying to do. This is the time to voice your views on the subject."

DISCUSSION

H V Army: 'I would like to discuss the subject solely from the standpoint of the registration of prescription pharmacists. This has been dear to my heart for more than twenty-three years. Back in 1912, I read a paper at the Denver meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION on what I called the American Institute of Prescriptionists. This was the first definite proposition made concerning this matter. I read some years ago a statement made in a scientific journal to the effect that any man who makes an outstanding discovery has to wait twenty years before it is realized. It is now twenty-three years since this proposition was brought out. I want to disclaim any precocity for my idea.

'In 1910 my good friend Dr. Walter Bastedo read a paper before the Academy of Medicine, New York, referring to the horrible degree of commercialism among the pharmacists in New York. He knew what he was talking about. He was not only an eminent physician but a pharmacist before he became a physician.

"In that paper of 1910, Dr. Bastedo suggested to the Academy of Medicine that the time would come when it would be necessary for doctors to have a list of certified pharmacists.

"It was just at that time we first heard of certified milk. Milk of all kinds was being sold regardless of standards. As you know, this certified milk authority investigated dairies to find which were safe and that was called certified milk. I see the danger of the certification of pharmacists by the medical group. For that reason I brought the paper to the Denver meeting. I requested that a committee be appointed to study the question, suggesting the matter to a group of outstanding men in our ASSOCIATION at that time. I also suggested that it was too important a matter to handle in that meeting, and asked that the committee report the following year.

'When the report was submitted in 1913 it came from one of the most eminent practitioners of that time. He has now gone to his reward. The report consisted in the decision that it was best to defer action.

'I have since addressed pharmaceutical groups in various cities. We stand now exactly where we stood in Denver in 1912—nothing done. The reason is the apathy of prescription pharmacists. They did not care to have it. I might make two notable exceptions—Dr. Hilton and Dr. Lascoff were willing. Other pharmacists were not willing. Those men who enjoyed high reputations as prescription pharmacists were enjoying a fine business and did not care to share it with others. I state this plainly because it is so. I made my swan song plea before the Academy of Medicine in New York and stated it was the last time I would bring the matter up.

I want to point out that as time has gone on, things have gotten worse and worse so far as commercialism of stores is concerned. I hope that my friends who are commercial pharmacists will not be offended. I even dare to say that only one out of one hundred stores is of the sort where I would want one of my own prescriptions filled. We have statistics which show that there

are 50,000 to 60,000 drug stores in this country, and there is not enough prescription business to support more than 5000 prescription drug stores. The problem is to segregate.

I think Chairman Cook's report is a model of skilful pleading. He has emphasized as much as he could that it has got to be, first of all, a voluntary action on the part of the prescription pharmacists.

If this proposal goes through it will act as a buffer between the prescription pharmacist and the prescribing physician. It will be a voluntary undertaking open to all prescription pharmacists, offering their names and submitting themselves and their pharmacies to an examination and permitting themselves to be enrolled upon the selected list of certified pharmacists. It is up to the prescription pharmacists to accept the invitation and receive the benefits.

"If you do not permit the AMERICAN PHARMACEUTICAL ASSOCIATION to do this service for you, the American Medical Association or some similar medical body will do it for you, with the result you will be under medical domination."

R V Robertson. My father and I are in the prescription business in Spokane. To me this is an outstanding move. We haven't a large business. We live and are happy. I do think we have here the start of something that can grow more than we realize. The American Medical Association's success, I believe, has been based largely upon its integrity within itself and its ability to control its own members. I agree with Dr. Arny that if we do not do it ourselves it will be done for us. I trust that wheels will be moved in this meeting that will further this.

S L Hilton. I have had the experience of more than twenty years of conducting a professional pharmacy. I cater almost exclusively to the physician and to the physician's patients. I think it fortunate that at the outset I was invited to become a member of the Medical Association of the District of Columbia. That entitled me to a fellowship in the American Medical Association. I receive every Saturday morning a copy of the *Journal of the American Medical Association*. The first thing I do is go over the copy as I know that before the day passes I will receive one to ten requests from physicians concerning it. I compel my clerks to do the same thing so that in my absence if a request comes from a physician they can comply. I have it on file in a regular filing cabinet where we can turn to it quickly. The result is, physicians at Washington are constantly in consultation with me and my clerks. It has been an advertisement that has been most profitable. I can say that 65-75 per cent of my business comes over the telephone and comes from the best people in Washington. I have felt that it has been one of the best assets I have had, to have cultivated the good-will of the physician and get the business. I have a complete line of bacterial strains, reagents that will keep so we are able to supply the demand promptly. Those that do not keep we make to order. We have one good size closet full of these products. We are constantly making them. We carry quite a stock of chemical glassware, and that is a profitable line. The physician appreciates it. I feel that the more we can do to assist in this movement in our own ranks the better it is for us, because if we do not do it someone else will do it for us and we will have to comply. Thank you.

President Fischel's requested expressions from retail pharmacists on the proposal if deemed not feasible.

Chairman E Fullerton Cook explained that the major objective is to give an opportunity to the professional pharmacists to register with the National Council and, in that way, acquire a distinctive place in the community by informing the public they are qualified to render professional service.

Frank Mortenson inquired whether the National Council will pass on pharmacists who are qualified. Chairman Cook replied in the affirmative and Mr. Mortenson stated that one pharmacist might be approved, another not.

Chairman Cook replied that this is the crux of any proposal of this kind and that it would not be possible for anyone to say at this time how the selection would be made. The pharmacist would apply for the opportunity, he would be requested to fill out a blank with facts concerning his pharmacy. If these are not acceptable the deficiency will be pointed out and an opportunity given him to conform. If the report is in conformity with the questionnaire then some plan of inspection would be followed. The American College of Surgeons has a plan of this kind in operation. They very carefully secure data concerning the surgeons and when accepted by the

Council they are registered. It is a very important factor in the success and standing of the surgeons of the United States. This plan would be operated in a similar manner.

Henry Hein remarked that this is a complicated subject and he was not surprised to learn of the time it has taken to arrive at this point. The cooperation of physicians is essential for effective operation.

President Fischelis asked for the views of a hospital pharmacist on the subject.

William Gray said that a hospital pharmacist has the viewpoint of the physician rather than the pharmacist, his duty is to serve the physician and answer all questions regarding pharmaceutical preparations. He is called upon for information regarding products. Therefore, in that respect a hospital pharmacist is listed in the effort.

H. A. K. Whitney stated he had all the bias of an individual who prides himself on the general practice of pharmacy, and pharmacy, only. Last year he was so attracted by this proposal that he took it upon himself to inquire in his home town, a city of 27,000 people, where there are two pharmacists, at least, who might qualify. Accordingly, he interviewed two of the proprietors and explained the proposition. In each instance the proprietor of the store intimated he would welcome an opportunity to ask for registration and would be pleased to display the emblem.

He approached another pharmacist, in a city of 11,000 people, who has been making an effort to contact the physicians. The results were favorable. Since then he has interviewed others with encouraging results. He believed that this proposal, if accepted, will be happily received by the pharmacists of the United States who are professionally minded.

President Fischelis pointed out that this is not an attempt on the part of the AMERICAN PHARMACEUTICAL ASSOCIATION to divide drug stores arbitrarily into two classes. The opportunity for certification is not limited to exclusive prescription pharmacists. Any store, properly equipped that can render the type of service required by the medical profession to day will be eligible to certification. He desired all to carry away a correct impression, those who have contributed to the deliberations have made it possible for the committee to intelligently study the proposal.

John Culley asked whether a provision for the emblem would show the public and the physician that the pharmacist is registered with the Council.

Chairman Cook felt assured that an emblem would be provided which would indicate its purpose.

C. E. Mollett said he was greatly interested in the proposal, it was one step in advance of that taken by Texas and California. They have tried to develop this idea. He hoped for the success of the movement, for it will be a wonderful thing for the professions. If a pharmacist is capable, if his equipment is proper, and he makes his displays so it is apparent that he practices pharmacy rather than merchandising, then the physician becomes a walking advertisement for him.

Edward Spease "The American College of Physicians and the American College of Surgeons have been mentioned here. They have undertaken certain functions. One is the selection of members. There are only a few members of the American College of Surgeons in each locality.

'One of the additional functions is known as approval of hospitals,' it means a study of each and every department in a hospital and certain regulations. Regulations have never been laid down for pharmacists in hospitals. We have been asked to outline recommendations and to appear before the American College of Surgeons in San Francisco this fall to present the matter and discuss the regulations which they hope ultimately to adopt. One of the first principles will be that every hospital must have pharmacy service, *first*, a resident pharmacist, or, *second*, pharmaceutical service from a proper pharmacy on the outside. That leads to the question. What is this approved pharmacy or proper pharmacy on the outside?"

Dean Spease considered this movement very timely and one that should be given consideration.

A motion was made by him, and duly seconded, that the recommendations of the committee be adopted.—Carried.

The next subject of the program was an address illustrated by lantern slides on "Prescription Department Economics—Some High Lights of the Revised Edition of the Professional Pharmacy" by Frank A. Delgado. (The address will be published in a later issue of the JOURNAL.)

President Fischelis commented favorably on the paper and announced as the next feature of the program a "Symposium on Prescription Pricing," presented by F C Felter

Mr Felter stated that he understood there would be two other speakers on the subject—Leonard Seltzer and G L Secord neither of them was here to present the papers Mr Seltzer's paper was read by C Leonard O Connell and will be published later Mr Felter presented his paper which is published in full in the *Pacific Drug Review* for September pages 28-34

There being no further business the meeting was adjourned

THIRD AND FINAL GENERAL SESSION

The Third and Final General Session of the AMERICAN PHARMACEUTICAL ASSOCIATION was convened at 8 00 P M Friday August 9th, by President Robert P Fischelis

The minutes of the Second General Session were read by Secretary E F Kelly, and approved President Fischelis stated that in the First General Session a telegram of greeting was sent to the Canadian Pharmaceutical Association in session in Vancouver B C The following message from this body has been received

Reciprocate good wishes for successful Convention Stop May your deliberations result in elevating the status of pharmacy and improving business and professional conditions hearty greetings to your members from Canadian Pharmaceutical Association

(Signed) R B J STANBURY *Secretary*

President R P Fischelis read a telegram from the Senior Past President John Uri Lloyd

Greatly pleased to be remembered by my friends of the AMERICAN PHARMACEUTICAL ASSOCIATION Much regret I could not be present Accept my thanks for your kind message With my best wishes for all

(Signed) JOHN URI LLOYD

President Fischelis read a communication received from Dr Edward Kremers, a former Honorary President of the ASSOCIATION, as follows

Traveling with the AMERICAN PHARMACEUTICAL ASSOCIATION for a lifetime I have seen many a state of the Union, but it has never been my good fortune to join my fellow members when our organization met in the Rockies or beyond When, therefore the ASSOCIATION decided to meet this year in Portland, I planned to go for I considered it my last opportunity to see the Pacific 'Behuet dich Gott es waer so schoen gewesen,' Behuet dich Gott, es hat nicht sollen sein However unlike the trumpeter of Saeckingen, I do not bemoan my misfortune for I have assurance that I am at the present moment most needed where I am Four candidates for the doctor's degree demand my presence here whereas at Portland there will be many a younger representative of American pharmacy to fill my breach due to my absence

However my thoughts are with the members of the AMERICAN PHARMACEUTICAL ASSOCIATION and more particularly with those members to whom I am attached by personal friendship To one and all I send cordial greetings in the hope that the Portland sessions may prove another step in the advancement of the calling we love and to which we have pledged our best life activities

Sincerely yours,

(Signed) EDWARD KREMERS

President Fischelis said that these communications will take the usual course

The final report of the House of Delegates was read by Chairman Rowland Jones of the House of Delegates

Chairman Jones called upon Mr R L Swain to read the Resolutions approved by the House of Delegates by title After reading them President Fischelis asked for a motion A motion was duly made and seconded that the report of the House of Delegates be adopted—Carried

President Fischelis called attention to the fact that the local press has been unusually

generous with reports of the convention The Local Committee made clippings, which were displayed

There being no unfinished business, President Fischelis requested Secretary Kelly to make a presentation He said in part "Among the efforts to secure popular recognition of pharmacy in the United States we recognize the exhibit at the Century of Progress Exposition in Chicago Many of us had the opportunity to visit the exhibit, and many have read about it in the lay press We realize that it created a profound impresson on the large numbers who were privileged to view the exhibit and recognize the great effort in time and attention to make this exhibit possible and to make it an outstanding success It is well known that the work was in charge of and definitely under the leadership of one of our prominent members

"At the meeting of the ASSOCIATION in Madison, two years ago, the Council authorized the secretary to prepare a tribute in suitable form When the secretary was ready to proceed with this very pleasant duty the chairman of the Committee, with his characteristic modesty, insisted that the tribute be paid to the other members, as well as himself With that understanding, the Council has instructed the secretary to comply with the request Now as most of you do not recognize of whom I am speaking I will ask Dr H C Christensen to please come forward Chairman Christensen is a man of parts, a man of distinction To night he stands here to represent not only himself but also the other members of the committee, Mr Julius Riemenschneider and Dr Frank A Kirby Those who visited the exhibit will recall that it was supervised by a very dynamic person, Miss Esther Barney In addition a student from the School of Pharmacy, University of Illinois Mr Niemic, contributed his services to demonstrate pharmaceutical dispensing Chairman Christensen has kindly consented to accept these memorials for himself and for the others in his organization for a most outstanding contribution to pharmacy

"Mr Christensen, I recognize that you have many things to frame in your house and feel sure Mrs Christensen will make room for this additional memorial I take pleasure in presenting to you these very simple but no less sincere tokens of our appreciation of the services of yourself and your associates, with the hope that they will be constant reminders of our appreciation and of the favorable impressions made on the many thousands who saw the exhibit "

H C Christensen spoke in part as follows

"Members of the ASSOCIATION, *Guests and Ladies* I hardly know what to say This was a complete surprise to me I am, however, happy to know that the effort we made to bring to the attention of the public the service which pharmacy renders to that public has been appreciated to such an extent by this wonderful ASSOCIATION, so that they recognize by this memento to me as *chairman*, and to my assistants on the committee for the exhibit, the efforts we made The time is too short to go into any details of the exhibit Those of you who visited it know what it consisted of, and the methods which we used in reaching the public

"This morning I presented what I titled as Part I of a history of the exhibit The first part mentions items regarding the inception, how it was suggested, and how it was finally taken over by the AMERICAN PHARMACEUTICAL ASSOCIATION and delegated to the Committee to carry out It would have been impossible for your Committee to carry out this problem without the assistance which it received so loyally not only from those in the profession but from many associated with the profession in the drug industry generally

"We collected something over \$14 000 00 We still have a little balance on hand which I might say will be used to install a reproduction of the exhibit in the Museum of Science and Industry in Jackson Park, Illinois on the site of the old Fair Grounds of 1893 This building, as some of you know, has floor space of between ten and twelve acres and a proper amount of space has been allotted to pharmacy for this exhibit Pharmacy will be one of sixteen exhibits mostly medical in a department to be known as the Department of Medical Science The pharmaceutical exhibit will be permanent We hope to reproduce the exhibit as it was at the Exposition in Chicago but we have in the contract the privilege to enlarge on the Exposition exhibit and make it permanent I believe you will agree that it is a great thing for pharmacy to be recognized on a basis with other medical science I believe this is the first time in the history of pharmacy that anything of that extent has been known "

Chairman Christensen thanked the ASSOCIATION and said he would convey these mementos to his colleagues in Chicago

There being no new business President Fischelis announced the presentation of the Ebert

Prize by Dr E V Lynn Chairman of the Scientific Section He said "It is my pleasure to formally announce that the Ebert Prize for 1935 has been awarded by the Committee on Ebert Prize to Professor Marvin J Andrews of the School of Pharmacy of the University of Maryland Baltimore, Md, for his papers on 'The Determination of the Reasonable or Permissible Margin of Error in Dispensing' presented to the Section on Practical Pharmacy and Dispensing To our regret, Professor Andrews was prevented from attending and receiving the award in person"

President Fischelis stated that as Professor Andrews is not here he would ask Secretary Kelly a very close friend to the Professor and who will no doubt have an opportunity to present the prize in person, that he do so when opportunity affords We are, of course, very sorry that Professor Andrews is not here to receive it in person

The next order of business was the installation of officers and President Fischelis requested L L Walton, who has in recent years served as installing officer, to come to the speakers' table He also called on William B Day to assume the active duties of Installation of Officers

President Fischelis said that only three new Council members are elected each year, and asked James H Beal, C H LaWall and R L Swain, to come forward Due to serious illness Dr LaWall was not present, the other members were duly installed

The Second Vice-President J Lester Hayman, and First Vice President, Frank A Delgado, were duly presented and installed

Editor E G Eberle and Secretary E F Kelly were presented

Owing to the absence of Treasurer Charles W Holton he was represented by Hugo H Schaefer in the installation

The officers of the House of Delegates, who had been installed were presented Roy B Cook *Chairman*, and C Thurston Gilbert, *Vice Chairman*

The installing officer said it was now in order to mention the most important member of this group, the man to whom the membership of the ASSOCIATION gives the greatest honor within its power and accompanies therewith the greatest responsibility, a man who has served the ASSOCIATION faithfully and well, who has presided over our House of Delegates very patiently and efficiently and to the satisfaction of the members, and who will make a worthy successor to our president—I refer to Patrick H Costello, of North Dakota and ask his presence up here before the assembly

President Fischelis said *President Costello*, you come to this office with a background of considerable experience not only as a pharmacist but as an Executive Officer of the Board of Pharmacy Shortly after I became president of this ASSOCIATION I was talking with a distinguished dean outside the field of pharmacy He was discussing what I might do in this office He said 'I have one piece of advice to give you—be yourself' I am sure if the president elect will 'be himself' we will be furnished with a very fine and efficient administration President Costello, I turn over to you the badge of office I know you will reflect honor on the AMERICAN PHARMACEUTICAL ASSOCIATION I turn over to you the gavel knowing, as do our members that you will use it wisely and well in presiding over the General Sessions "

Mr Costello Thank you Dr Fischelis for the praise you have given me I trust I will carry on in a manner you will approve of I am sure that as you relinquish the duties of president you will continue to give the type of service to the ASSOCIATION that you have in the past with distinction to yourself as a pharmacist "

President Fischelis called upon Mr Patrick H Costello for his address He spoke in part as follows

INSTALLATION ADDRESS OF P H COSTELLO

It is with a deep sense of gratitude and appreciation that I assume the duties and obligate myself to the responsibilities of the office of the President of the AMERICAN PHARMACEUTICAL ASSOCIATION The privilege of serving in the capacity is a distinction which I did not aspire to nor did I expect to be thus honored Only a comparatively few members have received this distinction and in my opinion the selection of my predecessor evidenced the good judgment of the membership

My desire is to serve acceptably and merit your approval—to do so will necessitate calling upon those who have guided and administered the ASSOCIATION wisely thus far for their counsel and advice in directing the affairs of this organization

In assuming any position without taking certain preparatory steps, it is apparent that the lack of information concerning details connected therewith serves as a temporary handicap. Unfortunately, or not, that is the situation, in the light of which it is not for me to make specific recommendations or criticism immediately after my induction into office.

"None are better able or more qualified to make timely recommendations or give direction than our officers, particularly the outgoing president, secretary and the members of the Council, who are continued in office and are thoroughly conversant with all phases of pharmacy and of the Association. Their recommendations, based upon experience and knowledge, serve a useful purpose.

It is for the House of Delegates, representing pharmacy as a delegate body, to consider carefully the recommendations and proposals placed before the members, before they are passed upon, especially those having to do with policy and organization. The House of Delegates is and should be to Pharmacy what Congress is to the Nation. Our profession has many members and individually, we may have many ideas and opinions, and many proposals and theories may be advanced.

"It is necessary that we have a delegate body, representative of pharmacy, to act as a clearing house for the plans and program to be carried out. That is the right way to do things, it is the American way. Between meetings, with your approval, the officers carry on in an understanding way. There is only one more democratic way, that is, to have contact with every one of the men and women who are engaged in Pharmacy. It would be impossible to have all represented at one meeting, and if it were, each could not be given an opportunity to express himself. A near approach to this would be to have the president and secretary of each State Pharmaceutical Association present at the meetings as delegates. They know the thought and the need in their respective states. Such close personal contact and the counsel of these divisional leaders would be valuable.

"During the past year the lack of a definite policy, definite objective and effective form of organization has been voiced frequently as a glaring fault of Pharmacy. This is a challenge to our thinking and our doing. That this organization could have increased the scope of its activities in the past cannot be denied, that it did not, is not to be criticised. Having for its aim and purpose the professional advancement of pharmacy, it is not strange that other organizations were brought into being to deal with the purely commercial side which was becoming an important factor. That situation made it logical for each organization to restrict its scope and function in its own field.

About twenty years ago it was recognized that pharmacy needed a more adequate representative machinery for doing the things, all too long neglected, and a federation of all pharmaceutical organizations was proposed—an affiliation of all State, National, County and Local associations.

"That same need is before us to day, and because we lack a unified force we still remain on the defensive. A fact, which has been repeatedly pointed out—is—that the total number of pharmacists holding a membership in any national organization does not represent a majority of the profession—should cause us to turn our attention seriously to ways and means of correcting that condition.

"I am not certain such a federation or affiliation is feasible, or the best form of organization but, since some State associations look with favor upon it, due consideration must be given it after all the factors pertaining thereto have been analyzed.

'An ideal situation would be one resulting from an awakening of the entire body of pharmacists whereby a majority would become organization-minded and active dues-paying members in our Association and others which serve their interests. To secure the greatest coöperation from pharmacists, we cannot at this time entertain proposals to limit our membership or make it too restrictive. I consider it unwise and impracticable and the means of rendering ourselves less effective as a group, if we avoid our responsibility to all pharmacists or close our doors to their membership. We cannot afford to limit ourselves either in members or influence.

'Fortunately we have recognized our own faults. We have served notice, so to speak, that the AMERICAN PHARMACEUTICAL ASSOCIATION does not approve practices that degrade the standing of pharmacy and will use our influence to keep them out. To do so is our job. We must secure and retain the confidence of the public, the coöperation and aid of those interested in public health and the assistance by legislation. We cannot ignore the conditions which prevail in pharmacy or

disregard our responsibility for some of them. The AMERICAN PHARMACEUTICAL ASSOCIATION should have close contact with all who profess to be pharmacists and represent them. If it is possible to encourage professional practice and ethics among the pharmacists of this country reaching out to them with educational material through a new publication or otherwise it must be done, and it is the duty of this organization to move in that direction.

"No matter what the causes or the compelling forces may be, commercialism is foreign to pharmacy and dangerous to its essential public health purpose. It is altogether possible for the AMERICAN PHARMACEUTICAL ASSOCIATION, with its prestige, its influence and its facilities, to combat it successfully and give direction in the future, if it can have the professional ear and the membership of a majority of those engaged in pharmacy, so it could speak for and through them.

'May we attempt to arouse and awaken sufficient professional interest to accomplish that much?' At no time has there been a greater need for numerical strength to support a worthy cause and at no time have conditions been more unfavorable for securing new members, yet I hold this to be necessary at this time and we should so plan, organize and execute our efforts so that the best results will obtain.

Beyond this, I suggest that no better manual for our guidance can be found than the recommendations which have been presented to the ASSOCIATION by the former presidents in their annual addresses and by the standing committees in reports. For to attempt to do so would be to repeat what has been ably presented. We have only to make a thorough study of this constructive material, coördinate the thoughts and recommendations into a definite program, with a definite policy to meet the demands of to day if it is diligently carried out.

"I have every confidence in the sincerity and the ability of the officers and members of the Council to act wisely and unselfishly. They have served long and well. I am delighted to have the opportunity to coöperate with them and serve you to the best of my ability in the interests of all of Pharmacy.

'In conclusion, may I express to you the hope that a material showing of progressive thought, action and coöperation in all fields of pharmacy may be recorded during the coming year.'

President Costello advised Chairman Day that he had no precedent to go by but would at this time ask Dr. Day to install another member of the Council. Dr. Fischelis automatically became a member of the Council upon his retirement from the presidency. He was duly installed as a member of the Council.

Dr. Rufus A. Lyman addressed the meeting as follows:

I have a token of esteem for presentation to a member from those who know him best. The problem these men had was to find the most proper man to make the presentation. It was desired that the presentation be made by a man who was independent. That was one reason why I was selected because in the seven and twenty years that I have belonged to the AMERICAN PHARMACEUTICAL ASSOCIATION I have never held an office of any kind, not even a chairmanship of a committee.

Continuing Dr. Lyman explained that he is regarded as the Will Rogers of the pharmacy group and he then went on in his traditionally humorous manner to entertain the members by relating additional reasons why he was chosen to make the presentation.

Dr. Lyman at the conclusion of his highly entertaining remarks called upon Dr. Robert P. Fischelis to accept the token which the speaker further explained was presented to Dr. Fischelis by the members of the Mercer County (New Jersey) Pharmaceutical Association. In making the presentation of the beautiful gold watch Dr. Lyman said: Dr. Fischelis when you look into the face of this watch I hope that you will see beyond its hands and the glittering letters the affection of your friends and the admiration of every one who has a connection with pharmacy.

Dr. Fischelis in accepting the gift stated that he was deeply touched by the kindness of the Mercer County pharmacists who had chosen to honor him in this way. He also expressed his thanks to the pharmacists of Oregon and especially the Portland group for many courtesies extended to him and to Mrs. Fischelis during the convention week. The fact that Mrs. Fischelis' grandfather had fought in the Indian Wars in Oregon while he was in the Pacific North West with the forty-niners created a bond of friendship with Oregonians which had been cemented by this meeting.

Dr. Fischelis referred feelingly to the support of many friends in the activities of the past

year and indicated that expressions in correspondence with outstanding pharmacists in all parts of the nation had given him encouragement in undertaking the things he had tried to accomplish. Referring to the necessity for spending much of his leisure time in promoting the affairs of the ASSOCIATION he also paid tribute to the patience and forbearance of Mrs. Fischelis who had been willing to make necessary sacrifices to permit him to serve the ASSOCIATION. Finally he thanked the members and guests in attendance for their part in making the Portland Convention so successful.

Dr. Day remarked that at the time the officers were presented Dr. A. G. DuMez, the editor of the YEAR BOOK, was not present, he invited him to step forward and be presented.

Chairman of the Council, S. L. Hilton, was presented.

Dr. Day believed the cabinet was now complete.

Chairman Fischelis resumed the Chair and called on Secretary Kelly who said: "I wish to express our regret for an unintended, an embarrassing omission, in that the name of a man to whom appreciation is due was not mentioned in the Resolution of appreciation to our hosts and I ask Frank Nau (Portland, Oregon) to rise and let us in theatrical terms, 'give him a hand.' I am sure the president will insist as will all present, that we correct the omission at once by including his name in the published Resolution of appreciation."

Chairman Fischelis, in concluding the session thanked the local pharmacists, particularly Dean A. O. Mickelsen, for the splendid way in which they had handled the details of the convention.

The 83rd Annual Meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION was then adjourned.

It may be necessary to defer the report of the House of Delegates to the next issue of the JOURNAL.

INTERNATIONAL PHARMACEUTICAL CONGRESS, 1885

'A large section of our space is occupied this month with the history of the proceedings of the sixth International Pharmaceutical Congress which held its sessions at Brussels from August 31st to September 5th (1885), inclusive. The event was one of singular interest. *Royalty patronized it*, a chief Minister of State presided over it, *a great City Council feled it*, *foreign governments appointed special delegates to its sessions*, and its proceedings were reported all over Europe. To an English observer all this was, as we have said, interesting and curious, perhaps more interesting and curious to us than to Continental pharmacists who regard their profession from a different standpoint to that which we occupy. The pleasure and advantage of social intercourse, the new ideas suggested and imbibed, and the incidental benefits generally picked up on such an occasion are of the highest value. It is a point for consideration whether the Continental or the English view of pharmacy is the true one — Retrospect of Fifty Years Ago' in *Chemist and Druggist*, September 7th. The report differs from that of this year's Congress but it is interesting to note that in some particulars there is similarity. (Italics ours.)

DISPENSING IN HOSPITALS

According to *The Australasian Journal of Pharmacy*, the Council of the Pharmaceutical Society of New South Wales has been instrumental in obtaining the cooperation of the New South Wales Branch of the British Medical Association on the question of doctors undertaking dispensing or the supervision of dispensing in public hospitals. The Branch has now intimated its willingness to advise its members that they should not undertake dispensing or the supervision of it in public hospitals where there is a chemist within a radius of two miles from the hospital. This cooperation is particularly gratifying, and may be regarded as the first step in the direction of obtaining dispensing in hospitals for qualified chemists. The position is one which has been causing organized pharmacy a considerable amount of concern for some years. The attitude of the New South Wales Branch is therefore very much appreciated in pharmaceutical circles.

The Australian Trained Nurses' Association has also signified its disapproval of nurses being called upon to undertake the responsibility of dispensing so that, with the active disapproval of both the medical and nursing professions, pharmacists have strong claims for the recognition of their professional qualifications.

EDITORIAL NOTES

LOCAL BRANCHES A PH A

It is hoped to include a revised roster of the A PH A Branches in the succeeding issue of the JOURNAL and the officers are requested to refer to pages XVIII and XIX of the July JOURNAL and mail revisions if necessary to the JOURNAL 2215 Constitution Ave Washington D C—Thank you

REMINGTON MEDAL AWARD AND DINNER

The Remington Medal will be formally awarded to Samuel L Hilton at a dinner which will take place at the Mayflower Hotel Washington D C on the evening of October 19th, at 7 00 P M The function is under the auspices of the District of Columbia Pharmaceutical Association of the District Veteran Druggists Association the District Board of Pharmacy, the members of the faculty of the School of Pharmacy George Washington University, and the New York Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION

Dr A C Taylor 1733 Upshur St N W Washington D C is directing the arrangements and tickets can be reserved for the occasion (The price is \$3 00 per person) A large attendance is expected

TRI-STATE MEETING

The states of Idaho Oregon and Washington held a most successful Tri-State pharmaceutical convention and added immensely to the success of the meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION The duties of the officers did not prevent them from taking part in the meetings but a number failed to register hence it is greatly regretted that their names are not recorded The list of registrants is printed in the August JOURNAL pages 679 and 680 It will please the ASSOCIATION to have their names for record and thanks are extended for the consideration

The name of F C Felter *Pacific Drug Review* was not in the list of record, he was among those in attendance and active in the work of the convention

THE EBERT PRIZE AWARDS

At the Portland meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION Marvin J Andrews was awarded the Ebert Prize

for his work on 'Determination of the Reasonable Permissible Margin of Error in Dispensing' The first Ebert award was made in 1874 to Charles L Mitchell, the Index of the 1874 volume of the PROCEEDINGS does not refer to the Ebert Prize for 1874 nor does the Collective Index 1851-1902 Under "Funds of the ASSOCIATION," YEAR BOOK volume for 1933, it is stated 'The Ebert Prize was awarded for the Year 1874 to Charles L Mitchell' As there was difficulty in finding the report on this, the first award search was made with the result that on page 782, of the 1875 volume of the PROCEEDINGS is a comprehensive report and the words of the award are

After full deliberation upon all the above points and considering the labor involved in the experiments of the subject matters of the three papers, the committee awards the Ebert Prize of the AMERICAN PHARMACEUTICAL ASSOCIATION, for the year 1874 to Mr Charles L Mitchell for his essay On the Active Principles of the Official Veratrum

The paper is published in the volume of the PROCEEDINGS for 1874 pages 397-426 Mr Mitchell graduated from the Philadelphia College of Pharmacy in 1872 and in medicine from the Jefferson Medical College, in 1880 He retired from the retail drug business in 1882 and engaged in the manufacture of pharmaceuticals He was one of the founders of Medico Chirurgical College and professor of Chemistry for two years He died in 1910, but his name does not appear under "Obituary" in the Index, these notes therefore may have reference value

The Collective Index for 1851 to 1902 does not list the 'Ebert Prize' under that head and search must be made for the awards under other headings F B Power, PROCEEDINGS for 1878 page 875, J U Lloyd, Volume 31 page 439 The first listing under 'Ebert Prize' is in Volume 55 reference to page 313 Other references may usually be found under—

'Committee' Report,' or the name of the recipient in connection with the paper presented

USE OF LACTIC ACID FOR NON ALCOHOLIC BEVERAGES

The manufacturers of non alcoholic beverages in Japan will use lactic acid in place of citric acid and tartaric acid both of which

Japan has imported for many years and the demand has been on a steady increase in recent years. This decision has resulted from the recent experiments carried on by Dr Yasuzo Hattori of the Imperial Hygienic Laboratory at Tokyo at the request of the Japan Non alcoholic Beverages Association. His conclusion is that lactic acid has a greater power of sterilization and its taste is milder than that of the other two acids.

HUNGARIAN DRUGS

Because of his country's position as the world's largest supplier of botanical drugs, Dr Peter von Betegh, Hungary, pointed out that officials of the Hungarian government after the war laid down a policy calculated to raise the quality of botanical products. It established agricultural stations under the direction of scientists of high rank, the Hungarian Board of Agriculture maintains a department which is authorized to control the condition and quality of the goods which are in the hands of the collectors as well as those held by the traders. Proper cultivation, collection and preparation of botanical drugs so that they will meet with U S P requirements rests in the hands of a staff of chemists whose services are at the disposal of all branches of the trade. Exports of botanical drugs from Hungary last year totaled 2,300,000 kilos, comprising more than 100 different items—Abstracted from *Oil, Paint and Drug Reporter*, September 9th.

COTTON STRIPPER TESTED IN HARVESTING PYRETHRUM

A cotton stripper altered to harvest pyrethrum will do the work successfully if the flower stalks are reasonably upright, the U S Department of Agriculture announced. The Bureau of Agricultural Engineering and Plant Industry have just finished making tests with such a machine and with a grain binder at points in Maryland and Pennsylvania.

COMMITTEE TO COORDINATE HEALTH ACTIVITIES OF GOVERNMENT

The interdepartmental committee to coordinate health and related welfare activities of the federal government is composed of Josephine Roche, Assistant Secretary of the Treasury, Chairman, Oscar Chapman, Assistant Secretary of the Interior, M L Wilson, Assistant Secretary of Agriculture and A J

Altmeyer, Second Assistant Secretary of Labor. The president has instructed this committee to include within the scope of its work not only health activities, but closely related welfare activities as well. This Committee is to be composed of physicians and other technically trained persons within the government service to study and make recommendations concerning specific aspects of the government health activities. It is hoped to bring about a complete coordination of the government's activities in the health field.

PERSONNEL CHANGES IN SWEDISH PHARMACEUTICAL CIRCLES

It is announced in *Farm Revy* (Aug 24, 1935) that King Gustav V has appointed the former head of the apothecary shop "Garnison" in Stockholm, Apothecary C F G Soderberg, to be chief of the Apothecaries' Bureau of the Royal Medicinalstyrelse (the official Swedish medical control). The former bureau chief, Apothecary Ernst Matern had requested retirement. Mr Söderberg is a former teacher at the Swedish Royal Pharmaceutical Institute and has been long connected with the State Pharmaceutical Laboratory.

The King has also appointed Apothecary Harold Nilsson as head of the State Pharmaceutical Laboratory. Mr Nilsson has been a teacher at the Royal Pharmaceutical Institute. Since 1930 he has been an assistant at the State Pharmaceutical Laboratory.

It may be noted that the Swedish pharmaceutical weekly, *Farmaceutisk Revy*, has changed editors, Apothecary A Welander retiring and Apothecary John Quist taking his place as new editor. Mr Quist's first issue is the number for the 17th of August (Vol 34 No 33).

At a meeting of the Nordiska Specialitetskommission in Stockholm in June it was decided to make up an "extra-pharmacopœia" (in common for the four Scandinavian countries) corresponding to the *Ergänzungsbuch* of the German pharmacopœia and citing test methods for non-official preparations. Among the commissioners are Prof Baggesgaard Ras mussen, E H Madsen and K A Jackerott representing Denmark, Apothecary A Nylander representing Finland, K L Schei and F de Lemos representing Norway and Dr A Rising, S Erikson and H Nilsson representing Sweden—*Courtesy Dr Clifford Leonard and Dr A G DuMez*.

PERSONAL AND NEWS ITEMS

In transcribing from *press copy*, inadvertently an error was permitted to pass through uncorrected in this section of the August JOURNAL page 732 name should be Robert Koch While the error will be recognized as such, the occurrence is regretted

The United States has accepted an invitation to be officially represented at a League of Nations Conference on Biological Standardization to convene at Geneva on October 1st The Department of State has appointed Chairman E Fullerton Cook of the United States Pharmacopoeia Revision Committee and Medical Director G W McCoy Director of National Institute of Health United States Public Health Service to represent it at the conference Chairman Cook advises that responsibilities in connection with pharmacopoeial and other duties prevent his acceptance

The *Industrial and Engineering Chemistry News Edition* of September 10th published a sketch of Dr James H Beal by Julius A Koch The writer refers to his work in various state and national organizations and in the promotion of legislation construction of the measures and his valuable services in pharmacopoeial revision He speaks of his love of nature and close observation which has resulted in a number of interesting collections, his shells comprise specimens that have made the collection outstanding and known to collectors and students throughout the world The article refers to his activities in the AMERICAN PHARMACEUTICAL ASSOCIATION An effort to abstract the sketch would fail in giving due credit hence these brief references are intended only to refer to the published sketch

President Robert R. Pierce, of W Va Pharmaceutical Association sends his first message as president to the members The bulletin as usual has been prepared by Secretary J Lester Hayman

Vice-Chairman C T Gilbert, of the House of Delegates A Ph A visited the American Institute of Pharmacy September 18th he was accompanied by his mother Among other visitors at the Headquarters recently were Herbert R Woods Evansville Ind Mr and Mrs T Zimmerman Terra Haute Ind, Mr and Mrs Roger A McDuffie and son Greensboro N C George F Reddish St Louis Mo Milton Wruble Kalamazoo Mich George H Parsons Library Clerk

N B C New York City, B E Holsendorf U S Quarantine Station Long Island, Pharmaciat, U S Public Health Service, R S Hollingshead, NRA Washington, D C

John S Zinsser, for some time connected with Merck & Co, has been elected president of Sharp & Dohme, succeeding A Homer Smith John S Zinsser is a son of Frederick G Zinsser —*Courtesy of Mr Smith*

OBITUARY

EDWARD V SHEELY

Edward V Sheely, aged 65 years, druggist and former postmaster of Memphis and guiding light in Memphis plans for the Tennessee Pharmaceutical Association's recent Golden Jubilee Convention was killed August 21st when his automobile was struck broadside by a truck at Huntington, W Va Mrs Sheely was critically injured, and Edward V Sheely Jr and his wife were severely cut and bruised in the accident In tribute to the deceased the druggists of Memphis closed their doors for a five minute period during funeral services for Mr Sheely the afternoon of August 24th

Born in New Oxford Pa, February 14, 1870 Mr Sheely spent his early youth in that city and there received his pre college training He graduated from the Philadelphia College of Pharmacy in 1892 two years later he moved to Memphis During his first three years here he worked for James S Robinson late veteran member of the AMERICAN PHARMACEUTICAL ASSOCIATION and then established a pharmacy at Vance and Lauderdale Streets, which to day after thirty five years is a Memphis landmark —Data from *Southeastern Drug Journal*

WILLIAM F MICHEL

William F Michel, 61 years old, of Watertown S Dakota died suddenly from heart attack July 20, 1935 The deceased was a force in South Dakota pharmacy circles for many years a former president of the State Pharmaceutical Association and for a number of years its secretary manager While holding the latter office he established *The Optimist* and continued it until the time of his death He was fearless in his editorials

When the AMERICAN PHARMACEUTICAL ASSOCIATION met in Rapid City, Mr Michel took a deep interest in the convention and during recess he was the center of groups of listeners

SOCIETIES AND COLLEGES.

NATIONAL ASSOCIATION OF RETAIL DRUGGISTS

The National Association of Retail Druggists convenes this week in Cincinnati (week of September 23rd). Among the features are the Drug Show, various conferences, including that on Prescription Economics, U S P and N F Propaganda. U S Senator Millard E Tydings, of Maryland, will be a speaker, others listed are Col Charles H March, of the Federal Trade Commission, R L Swain, E F Kelly, Robert P Fischels. Addresses are scheduled by Dr James M Doran, administrator of Distilled Spirits Institute, and Arthur J Mellott, deputy commissioner of Internal Revenue.

NATIONAL WHOLESALE DRUGGISTS' ASSOCIATION

The prohibition of below cost sales together with other plans for eliminating unfair trade practices, will be among the chief topics of discussion at the convention of the National Wholesale Druggists' Association to be held at the Greenbrier Hotel, White Sulphur Springs, West Va., September 29th to October 3rd. It is understood that Col Charles March of the Federal Trade Commission will attend the convention and may discuss the fair trade practice rules which are being used to govern wholesale druggists.

NEBRASKA

Working in coöperation with the Nebraska Pharmaceutical Association, local druggists, health associations and the local police authorities, state officials are moving to enforce two new drug regulations which went into effect on August 26th. The state department will be able to keep a record of violations under the uniform narcotic law. According to the director, very few druggists have sold narcotics illegally in the state. Another law regulates the sale and dispensation of barbitol, hypnotic or somnifacient drugs, and will be administered under the state department of agriculture and collections. A plan is being worked out for enforcing the law in cooperation with state pharmaceutical and medical associations.

Will Brookley, of the Nebraska Pharmaceutical Association, was a visitor at the AMERICAN INSTITUTE OF PHARMACY on September 20th.

MONTANA

Montana Pharmaceutical Association elected the following officers: *President*, George W Sparrow, Anaconda, *First Vice President*, Charles A McFarland, Helena, *Second Vice President*, Leonard Morrow, Fort Benton, *Third Vice President*, George M Gossman, Dillon, *Treasurer*, Charles Adams, Lodge Grass, *Secretary*, J A Riedel, Boulder.

WISCONSIN DRUG SHOW

Sponsored by the Wisconsin Pharmaceutical Association and the Milwaukee County Association, a state wide drug show will be held October 28th to 30th, at the Schroeder Hotel to mark the 55th anniversary of organized pharmacy in Wisconsin.

ALUMNI LUNCHEON, PHILADELPHIA COLLEGE OF PHARMACY

The Alumni of Philadelphia College of Pharmacy and Science gathered together at a luncheon on August 9th, at Portland, Ore about fifty of their number were present.

ASSOCIATION OF MILITARY SURGEONS OF THE UNITED STATES

The 43rd annual meeting of the Association of Military Surgeons of the U S will be held at the Waldorf Astoria, New York City, October 3rd-6th. Col J W Grissinger is chairman of the Committee on Arrangements.

INTERNATIONAL HOSPITAL ASSOCIATION

Dr Sidney Lamb, of Liverpool, has been elected *secretary general* and *treasurer* of the International Hospital Association.

HOWARD UNIVERSITY

Howard University, Washington's Government subsidized center of Negro learning and culture, has entered on its 68th year. In course of construction now is a new chemistry building which, when completed and equipped will have cost about \$626,000.00.

The nine divisions of the University are the Graduate School, the College of Liberal Arts, the School of Engineering and Architecture, the School of Music, the School of Religion, the Law School, the College of Medicine, the College of Dentistry and the College of Pharmacy.

LEGAL AND LEGISLATIVE

MARYLAND LEGISLATION

The pharmacy organizations of Maryland have mailed out the following information to physicians through its official publication—*The Maryland Pharmacist*

The Maryland Pharmaceutical Association, in cooperation with the Baltimore Retail Druggists' Association, takes real pleasure in the success of the pharmaceutical legislative program. Several bills were introduced in the General Assembly and passed for the purpose of bettering pharmaceutical service and to more adequately control the manufacture and distribution of drugs, medicines and poisons.

Specifically the new laws accomplish the following:

Veronal, Phenobarbital and other salts of barbituric acid may only be obtained on prescription.

Poisons may be sold only by registered pharmacists in strict conformity with the record keeping provisions of the law. The State Board of Health is empowered to restrict the sale of poisons to prescriptions when the public welfare so warrants.

'All manufacturers of drugs, medicines, toilet articles and dentifrices must operate under a permit issued by the Maryland Board of Pharmacy, and the technical qualifications of persons so engaged must be approved by the Board.

'All drug stores must possess at least the minimum of professional and technical equipment which the Board of Pharmacy prescribes.

Medicine Shows' and Patent Medicine Shows' are made unlawful. Unsafe and indiscriminate distribution of drug samples is prohibited.

It is the belief of these associations that these new laws will meet with the approbation of the medical profession and that they will contribute greatly to a higher professional standard in the manufacture and distribution of drug products.

HIGHER RETAIL ETHICS

Consolidated Brooklyn Retail Pharmacists Inc. Brooklyn has been chartered by the Secretary of State at Albany as a membership corporation without capital stock. The particular objects and purposes of the corporation as stated in its certificate are:

To work together for the purpose of raising the standards and ethics of retail pharmacists

and druggists, to improve the working conditions of retail pharmacists and druggists, to endeavor to prevent unfair competition and unfair trade practices by retail pharmacists and druggists or others, to propose beneficial legislation for retail pharmacists and druggists and to cooperate with each other for the improvement of business in retail pharmacies and/or drug stores, and to do such further acts or things as may carry into effect the foregoing purpose. George Gottesman, W. W. Sitterley, Percy Goldman, George L. Chudow, J. M. Sarrett, Boris S. Priol, Brooklyn, are the incorporators. Alfred S. Perlstein, 66 Court St., Brooklyn, is attorney for the association.

MONTHLY REPORTS ON RETAIL DRUG STORE SALES

The Department of Commerce expects to publish a series of monthly reports on sales in retail drug and grocery stores. The initial reports in the series will be confined to the states of Illinois, Indiana and Wisconsin, but the department hopes to extend them later to cover every state in the Union. The figures published are expected to reveal general trends, inasmuch as the stores which have agreed to cooperate cover both rural and urban areas.

Director Claudius T. Murchison, of the Bureau of Foreign and Domestic Commerce, delivered an address at the Boston Conference on Distribution, September 24th, on 'Research Needs and Activities in Field by Distribution.' The remarks of Director Murchison were timely. A few lines from the conclusion of the address are quoted:

Whatever be the immediate aim of given research activities in the field of distribution there should be in all of them implicit recognition of the essential unity of purpose which provides all agencies and all functions in the field of distribution. The increased effectiveness of any agency is a contribution to the welfare of all agencies.

CHINESE DEMAND FOR AMERICAN MEDICAL PREPARATIONS

Chief C. C. Concanon, of the Commerce Department's Chemical Division, states that China is becoming increasingly important as a market for American medicinals. In 1924 China stood seventh among foreign countries as a producer.

BOOK NOTICES AND REVIEWS.

The Structure and Composition of Foods By ANDREW L. WINTON, Ph D., and KATE BARBER WINTON, Ph D. This is Volume II of the valuable work—Vegetables, Legumes, Fruits, with more than 300 illustrations. The first volume dealt with Cereals, Starch, Oil Seeds, Nuts and Forage Plants. The publishers are John Wiley & Sons, Inc., the price of Volume II is \$15.00. The following is from the Preface: "The chemical sections of this volume, in addition to conventional analyses, record epoch making discoveries, largely recent, on the occurrence and constitution of lesser known constituents such as organic acids, pectins, natural flavors, colors (notably chlorophyll, carotenoids, lyochromes and anthocyanins), the chemical substances classed as vitamins, and minor mineral constituents. Complete unanimity of conclusions on certain points can hardly be expected, nevertheless, the matter available, on the whole, fills with remarkable completeness the gaps in the literature."

The sections with illustrations on microscopic structure represent the authors' original work in large part here recorded for the first time. The text covers 855 pages, the index 50 pages, careful attention is given to the inclusion of references. This authoritative work will be welcomed by chemists and libraries.

Pharmacists will find *Merck Medical Memoranda*, published monthly of value. It is issued in the form of cards and, no doubt, physicians consider the Memoranda useful references. Twenty five reports are issued monthly. Data from a card will explain, for example, Anemia, Therapy, the treatment is given, the diet and a reference made to articles bearing on the subject. The annual subscription is \$3.00.

Drug Standards Manual. The 1935 revised edition of the Manual, including Tolerances and Methods of Analysis is now ready for distribution.

This compilation, prepared by the combined

pharmaceutical contact committee of the American Drug Manufacturers' Association and the American Pharmaceutical Manufacturers' Association, with the cooperation of the Food and Drug Administration, United States Department of Agriculture, comprises seventeen monographs on "Ampuls," thirty six monographs on "Compressed Tablets," and eighteen monographs on "Hypodermic Tablets." The price of the Manual is \$3.00. It may be obtained from the American Drug Manufacturers' Association and the American Pharmaceutical Manufacturers' Association.

DICTIONARY OF AMERICAN BIOGRAPHY

"The Council of Learned Societies kept in its hope for a quarter of a century the preparation of this work and finally found the way to carry that hope into a fruition that compares favorably with Great Britain's Dictionary of National Biography in the scholarly authority of the articles, in the factual accuracy, in the style of presentation and in the format and letterpress of the volumes. The whole patriotic undertaking is a credit to American learning. The sixteenth volume was published recently and the twenty volumes will be completed next year. The end now in sight prays the beginning of this high venture."

Among many known to pharmacy whose biographies have appeared are Samuel P. Sadtler, Charles Rice.

The AMERICAN PHARMACEUTICAL ASSOCIATION is indebted to Drs. Glenn L. Jenkins and A. G. DuMez for an autographed copy of "Quantitative Pharmaceutical Chemistry."

J. Leon Lascoff has presented the library of the AMERICAN PHARMACEUTICAL ASSOCIATION with a "Physicians' Pocket Manual of Useful Drugs, Chemicals and Preparations," prepared by the U. S. P. and Propaganda Committee of the New York State Pharmaceutical Association.

PHYTO-PHARMACY.

The author, who is Professor at Louvain University, suggests that the pharmacist, by his training in chemistry and botany, is qualified to supply fungicides and insecticides, and give advice on the treatment of plant diseases. He thinks that a study of vegetable pathology, mycology and entomology should enable a pharmacist to replace the seedsman as a more intelligent supplier of certain products for use in horticulture and agriculture.—V. ESTIENNE, *The Pharmaceutical Journal*, August 31, 1935.

NOTICE TO CONTRIBUTORS TO THE JOURNAL AMERICAN PHARMACEUTICAL ASSOCIATION

The following notice has been prepared from comments received from members of the Board of Review of Papers and of the Publication Committee

Manuscripts should be sent to Editor E G Eberle, 2215 Constitution Ave, N W, Washington, D C

All manuscripts should be typewritten in double spacing on one side of paper 8½ x 11 inches, and should be mailed in a flat package—not rolled The original (*not* carbon) copy should be sent The original drawings not photographs of drawings, should accompany the manuscript Authors should indicate on the manuscript the approximate position of text figures All drawings should be marked with the author's name and address

A condensed title running page headline, not to exceed thirty five letters, should be given on a separate sheet and placed at the beginning of each article

The method of stating the laboratory in which the work is done should be uniform and placed as a footnote at end of first page, giving Department, School or College The date when received for publication should be given

Numerals are used for figures for all definite weights, measurements, percentages, and degrees of temperature (for example 2 Kg, 1 inch 20.5 cc, 300° C) Spell out all indefinite and approximate periods of time and other numerals which are used in a general manner (for example one hundred years ago, about two and one half hours seven times)

Standard abbreviations should be used whenever weights and measures are given in the metric system e g, 10 Kg, 22.5 cc, etc The forms to be used are cc, Kg, mg, mm, L and M

Figures should be numbered from 1 up, beginning with the text figures (line engravings are always treated as text-figures and should be designated as such) and continuing through the plates The reduction desired should be clearly indicated on the margin of the drawing All drawings should be made with India ink preferably on white tracing paper or cloth If coordinate paper is used a blue lined paper must be chosen Usually it is desirable to ink in the large squares so that the curves can be more easily read Lettering should be plain and large enough to reproduce well when the drawing is reduced to the width of a printed page (usually about 4 inches) Photographs intended for half tone reproduction should be securely mounted with colorless paste

Figure" should be spelled out at the beginning of a sentence, elsewhere it is abbreviated to Fig, ' per cent—2 words

The expense for a limited number of figures and plates will be borne by the JOURNAL, expense for cuts in excess of this number must be defrayed by the author

References to the literature cited should be grouped at the end of the manuscript under the *References* The citations should be numbered consecutively in the order of their appearance (their location in the text should be indicated by full sized figures included in parentheses) The sequence followed in the citations should be Author's name (with initials), name of publication volume number, page number and the date in parentheses Abbreviations for journals should conform to the style of *Chemical Abstracts* published by the American Chemical Society

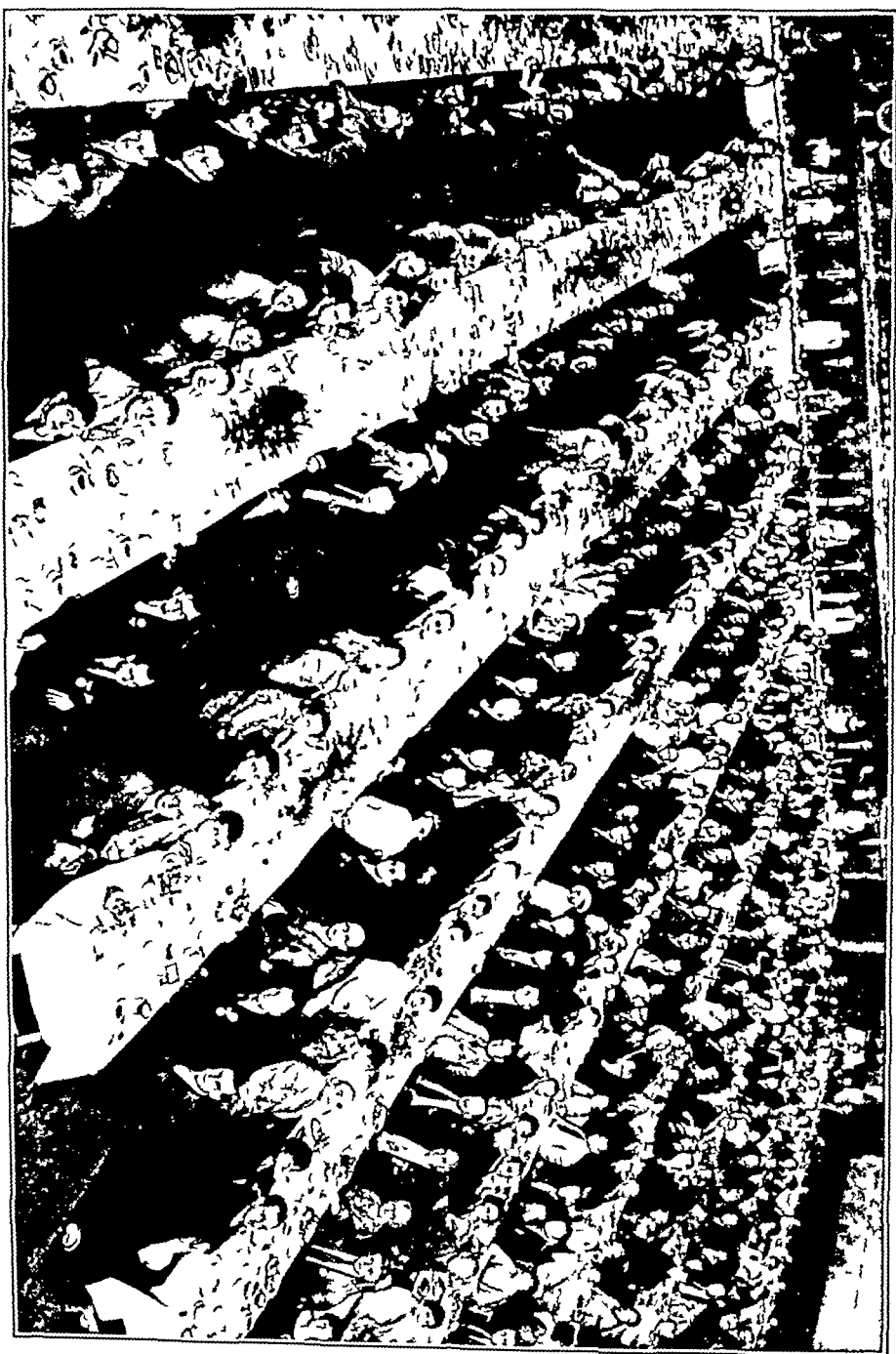
(1) Author A Y *Am J Physiol* 79:289 (1927)

Papers presented at the Sections of the AMERICAN PHARMACEUTICAL ASSOCIATION'S annual meeting become the property of the ASSOCIATION and may at the discretion of the Editor be published in the JOURNAL Papers presented at these Sections may be published in other periodicals only after the release of the papers by the Board of Review of Papers of the JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

The Editor will appreciate comments from Board of Review and Committee on Publication members authors and others interested

On account of Pharmacopoeial National Formulary and ASSOCIATION matter, the number of pages in this section has been limited, in succeeding issues it is hoped to have the usual number of pages, this applies also to the Roster

Tri-State Association Banquet at Portland—Idaho Oregon and Washington groups with members of their families and friends





CARL AUGUST ROJAHN

JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

VOL XXIV

OCTOBER 1935

No 10

CARL AUGUST ROJAHN, HONORARY MEMBER OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

Prof Dr Carl August Rojahn, who was elected honorary member of the AMERICAN PHARMACEUTICAL ASSOCIATION at the Portland meeting, was born September 23, 1889, in Duisburg, Germany. He served a 3-year apprenticeship in the Pellican Apotheke, Dueseldorf, where he passed the examinations. He studied in Marburg and then in Braunschweig, where he passed further examinations and, in Rostock, those for chemist. Engaged in research on Pyrazol-Ketone, he received the degree of Doctor of Philosophy, with honor.

He was military chemist and then assistant at the Chemical Institute of the University of Frankfurt from 1917 to 1919, later, assistant at the Pharmaceutical Institute in Frankfurt. He continued similar work at the Pharmaceutical Institute of Braunschweig and, thereafter, was named professor and head of the Pharmaceutical Division of the Chemical Institute. He was then called to Freiburg and a year later elected professor and divisional director at the Chemical and Pharmaceutical Institute of the University of Halle, in 1929, he was named director of the Institute.

Dr Rojahn has been very active in research, pharmaceutical analyses and investigations of various galenicals, all of his work is done carefully and thoroughly and is marked by his personality. He is author of the revised edition of Autenrieth and of the volume on Pharmaceutical Practice.

H Beckurts, in the foreword of the German YEAR BOOK for 1924, refers to Dr Rojahn as a former assistant, whom he had secured as co-worker for the division of Chemistry of Foods. Since 1928 he has been editor of the YEAR BOOK and the value of this work has been enhanced by the many sources of general information which Dr Rojahn has at his command. He is constantly interested in whatever serves the profession and German pharmacy is marked by his activities.

Dr Rojahn has been honored with the Prussian life-saving medal awarded for the saving of life and risking his own. Opportunity is taken to welcome the Honorary Member.

EDITORIAL

E G EBERLE EDITOR

2215 Constitution Ave WASHINGTON D C

DEDUCTIONS FROM THE PAPERS OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

MANY papers of the Scientific Section of the AMERICAN PHARMACEUTICAL ASSOCIATION related to Pharmacopœial and National Formulary subjects, not only contributing to the standards, but as preparatory work for establishing and improving them, if possible. A number of the papers were prompted by the conference on the study of opium assays by the Committee upon Uniform Method of Opium Assay, which has been working under the auspices of the Health Committee of the League of Nations since 1931. It is hoped to present some of these in an early issue of the JOURNAL. Quite a few dealt with improved assay and standardizing methods, ergot and antiseptics were among the outstanding subjects. The list shows a studiously prepared program and the phases to which the contributors devote careful study and investigation, there is no desire to place the value of the research of one above the other, but to briefly express appreciation for the work reported at these sessions.

The Section on Practical Pharmacy considered papers on improved methods of preparation and dispensing, and quite a number added interest to the sessions by papers dealing with various phases of hospital pharmacy and prescription practice.

The Section on Education and Legislation gave considerable time to the study of fair methods of practice and business conduct. The public attitude to the retailer and the relationship of other professions with that of pharmacy proved of interest.

The Section on Commercial Interests devoted time and attention to uniformity in prescription pricing, the prescription department, publicity, drug store methods, the effect of Fair Trade Acts, the place of the pharmacist in the community and the commercial training in business and educational institutions.

Seldom has a more interesting program been presented by the Section on Historical Pharmacy. A number dealt with early materia medica and pharmacists of earlier periods, several of the papers have been published and it is interesting to note that a pharmacist, David Henshaw, was a Secretary of the Navy, copy has been made of an early engraving which may be found in this issue of the JOURNAL.

As heretofore stated, there is no desire to valueate the papers, the purpose of the comment is to give credit to all who made the interesting sessions possible, other divisions of the meeting will be given consideration in succeeding issues and in the meantime some of the papers will be published.

EDUCATION OF THE PUBLIC IN FAIR TRADE PRACTICES

IT HAS been said in these columns that the underlying motive of National Pharmacy Week is the education of the public relative to the mission and service of pharmacy. This includes also the possibility of the votaries deriving a living income by rendering service and that the pharmacist should not be subjected to the unfair methods which are practiced by certain activities and have become more or less established, for thereby the professional man and the small dealers, as well

as the community, suffers, advancement in education is essential to good public health service and depends on the success of those engaged in its divisions

Senator Millard Tydings, at the meeting of the National Association of Retail Druggists, voiced a vigorous defense of the demand of retailers for stabilization of the activity. It is evident from his remarks that, in his opinion, regulatory legislation should be enacted.

The subject of fair practices has been studied and the viewpoints discussed by various organizations of the drug industries, but the conclusions and methods for making regulations practical and effective present as great difficulties as the study of the conditions which make legislation necessary. The subject is being carefully studied and a general procedure has been formulated, using as a basis, in part, legislation that has been enacted, and the successful results by the committee will contribute an outstanding service to the public.

The coordinated divisions are concerned in the success. President A. Kiefer Mayer, of the National Wholesale Druggists' Association, said, in substance, "the retailers' interests are our interests as an unwritten by-law of the Association," he emphasized the necessity for sound distributive practices which will give the retailers rightful consideration and show the wholesalers a fair margin for their services. He urged support for manufacturers who are following policies of distribution which are legally sound and recognize both the essential service and the economic necessity of the wholesaler. A circumspection shows the concern of all divisions and should result in a working together with thoughtful consideration of those served. The message of the comment is to work coordinately in educating the public relative to their interest in bringing about honesty and fairness in all activities.

THE RELATIVE POSITIONS IN MATERIA MEDICA OF INORGANIC, SYNTHETIC ORGANIC AND NATURAL ORGANIC SUBSTANCES

President Roy Gardner, in an address to Section "O," Australian and New Zealand Association for the Advancement of Science, said he felt "very definitely that this is a time when a general broadening of outlook in connection with scientific matters is urgently required, and it behooves scientific workers of all ranks and in all divisions of science to make an earnest effort to see their own positions in proper perspective."

Quoting other portions of his address—"Science is very young, but we of the present generation, being ourselves just too young to have taken part in the early struggle of science for recognition, can very easily forget the fact and overlook its implications. It is well for us to remind ourselves occasionally that, for instance, less than two ordinary lifetimes have elapsed since the isolation of the first alkaloid."

Concluding his address he reminded his hearers that "it is vitally necessary to consider not only the growth of science, but also the relationship of science to other aspects of human life. There are not lacking those who blame the growth of science for most of the world's present troubles, on the other hand, we are told that the remedy lies in more science. The truth seems to be that, while science should, and must, continue to go ahead, civilization in its other aspects must adjust itself to that progress—must use the fruits of progress properly—or the result will be chaos." In his opinion "it would be conducive to the necessary adjustment for those who

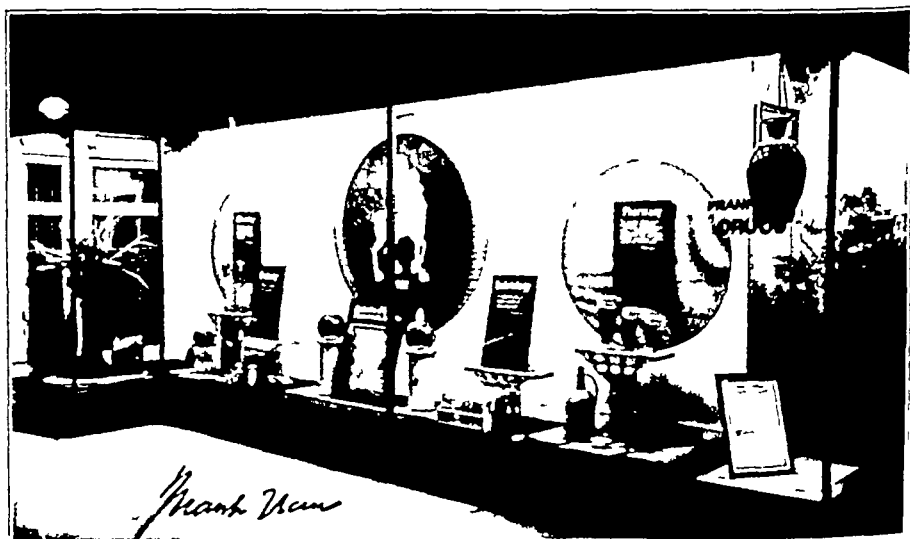
best understand science—the scientific workers themselves—to interest themselves more in fields of work other than the scientific” “Pharmacy,” he said, “is an occupation that lies on the border-line between science and commerce. Those pharmacists who take seriously their duty to the world are well placed for obtaining an enlightened view of science on the one hand and of economic and ethical considerations on the other.” He appealed to them to take such a view and to act accordingly. To some, such a remark may appear out of place here, but he did not take that view. Pharmacy as a field of work dealing with health has its own special responsibility, and, in addition, a share of the general responsibility for watching the growth of Science, and seeing that the world makes a right use of it for the benefit of mankind generally.

THOUGHTS FROM AN ADDRESS BEFORE WISCONSIN STATE PHARMACEUTICAL ASSOCIATION BY RALPH M. CARTER, M.D.*

The pharmacist does not carry his large and heterogeneous stock because he wants to but just because the public demands it and the very physician who criticizes the pharmacist the most would in all probability be one of the last ones who would be willing to do without the many services of the ordinary drug store. However on the other hand if a pharmacist really desires prescription business he should take a professional attitude toward this business, and see that his prescription department is thoroughly equipped and conducted in an ethical manner.

Both professions must try to understand each other's problems and by means of inter professional meetings and relationships gradually work out a solution which is satisfactory to both sides. This cannot be accomplished over night but I feel that with earnest effort on both sides it can eventually be done. To fulfil the task requires patience, understanding, tolerant minds, education and last but not least so far as is possible a return to ancient ideals' —*Wisconsin Druggist* for October

* President elect of Wisconsin State Medical Association



This window was arranged by Frank Nau, Pharmacist of Portland; greetings are extended to the AMERICAN PHARMACEUTICAL ASSOCIATION in lower right hand frame. Chronograph shown in the center.

SCIENTIFIC SECTION

BOARD OF REVIEW OF PAPERS—*Chairman*, F E Bibbins, George D Beal, L W Rising, H M Burlage, L W Rowe, John C Krantz, Jr, Heber W Youngken

(To be revised)

THE QUESTION OF ASSAYING ERGOTOCIN, THE NEW ERGOT PRINCIPLE *¹ 2

BY EDWARD E SWANSON, CHESTER C HARGREAVES AND K K CHEN

Ergotocin is the new ergot principle isolated by Kharasch and Legault (1) in collaboration with Adair and Davis (2). It melts with decomposition at 155° C, has the probable empirical formula of $C_{21}H_{27}O_3N_3$, and forms easily soluble salts such as the maleate. In a pharmacological paper by Davis, Adair, Chen and Swanson (3), evidence has been presented that the action of ergotocin is different from that of ergotamine or ergotoxine, and it should therefore be standardized by newly developed methods. The substance has a specific and prompt oxytocic effect upon the postpartum human uterus, and offers therapeutic possibilities in obstetrical practice. The present paper is concerned with the comparison of six different methods used in our laboratories for the examination of ergotocin—the polarimetric, the colorimetric, the U S P cock's comb, the isolated rabbit's uterus, the postpartum dog's uterus, and the postpartum human uterus. In all instances, ergotocin maleate was employed. As shown in Table I, a total of 35 lots were assayed. Those numbered 1, 2 and 3 were repeatedly purified and set aside as laboratory standards, those numbered 5, 7, 14, 15, 16, 17, 18, 19, 21, 24, 25, 27, 31, 33, 34 and 35 were factory lots for marketing, and the remaining ones were made by modified processes and subjected to similar tests. The majority of the samples were assayed by three or four methods, only four lots being standardized by the six methods. The authors owe their indebtedness to Drs Fred L Adair and M Edward Davis, Department of Obstetrics and Gynecology, University of Chicago, for the clinical assay which was carried out by a method developed in their clinic (4), to Dr E C Kleiderer for the polarimetric examination, and to Mr A N Stevens for the colorimetric determination.

RESULTS

1 Isolated Rabbit's Uterus Method—Unlike ergotamine and ergotoxine, ergotocin stimulates the isolated rabbit's uterus in dilute concentrations. The response of the mature organ appears to be proportional to the dose, which fact may be utilized for the quantitative evaluation of the product, just as the isolated guinea pig's uterus has been used for the assay of posterior pituitary extracts. Figure 1 shows a typical example of the experiments. It may be interesting to mention here that all the lots showing 100 per cent potency by this method proved to be clinically satisfactory.

In a previous communication (3), it has already been emphasized that ergotocin does not antagonize or inhibit the action of epinephrine, so that the well-known

* Scientific Section A. P. H. A. Portland meeting 1935.

¹ From the Lilly Research Laboratories, Indianapolis.

Eli Lilly and Company introduced this new ergot principle under the name of *Ergotrate*.

Broom-Clark method (5) is useless in determining its potency. On the contrary, the effect of ergotocin is diminished after the previous application of ergotamine, such as on the isolated rabbit's intestines. The same can be demonstrated on the

isolated rabbit's uterus after ergotocine, as shown in Fig 2. In fact, ergotocin can almost take the place of epinephrine in the performance of the Broom-Clark test.

2 U S P Cock's Comb Method—Using ergotocine ethane sulphonate as the standard, the first three lots of ergotocin proved to be 24 to 43 per cent more potent, but subsequent factory lots showed the same activity as the standard, with the exception of one (lot No 34) which was 12 per cent in excess. In no instance was ergotocin maleate found to be weaker than ergotocine ethanesulphonate, gram for gram.

3 Polarimetric Method—In aqueous solution, ergotocin maleate is dextrorotatory and has a specific rotation $[\alpha]_D^{28}$ of about $+52^\circ$. From Table I, it may be noted that lots having a specific rotation $[\alpha]_D^{28}$ less

than $+50^\circ$ were correspondingly low in physiological potency. The highest reading ever recorded was $+55.4^\circ$. Only in one case (lot No 6) did the optical rotation deviate from the biological assay.

4 Colorimetric Method—The Smith colorimetric method (6) with *p* dimethyl amino-benzaldehyde can be similarly applied to ergotocin. The readings by this method, as shown in Table I, check within 10 per cent with the results obtained by

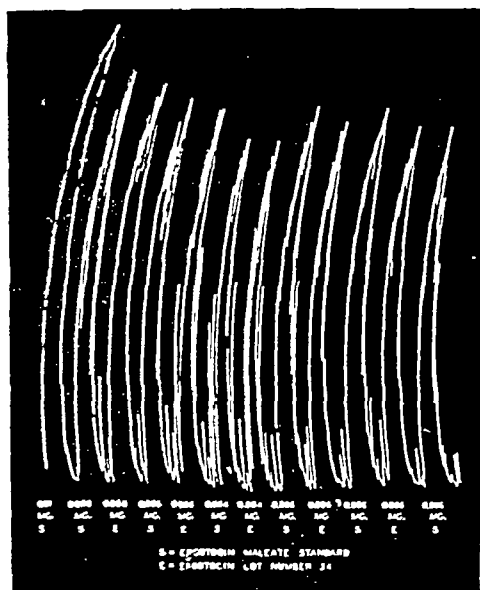


Fig 1—An example of ergotocin assay by the isolated rabbit's uterus method.

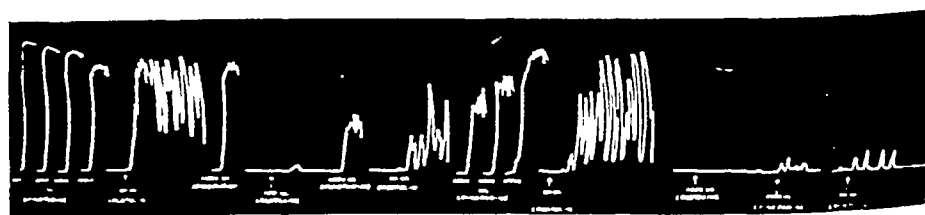


Fig 2—Absence of inhibitory action of ergotocin over epinephrine on isolated rabbit's uterus and diminution of ergotocin action by previous use of ergotocine.

the isolated rabbit's uterus method, only in one case (lot No 14) the difference is greater, that is 17 per cent.

5 Postpartum Dog's Uterus Method—The technique of this method has been described by one of us (E. E. S.) (7). The results obtained designate the minimal

effective dose given either by vein or by a stomach tube In the few tests carried out, the data are on the whole confirmatory of those by other methods (Table I)

TABLE I—ASSAY OF ERGOTOCIN MALEATE BY VARIOUS METHODS

Lot No	Isolated Rabbit s Uterus Lots 1 2 and 3 = 100 Per Cent	U S P Cock s Comb Ergotoxine = 100 Per Cent	Specific Rotation $[\alpha]_D^{25}$	Colorimetric Lots 1 2 and 3 = 100 Per Cent	Postpartum Dog s Uterus		Postpartum Human Uterus 0.4 Mg by Mouth
					By Vein 0.01 Mg per Kg	By Stomach Tube 0.2 Mg per Kg	
1	100	135	+52.0		Active	Active	Typical response
2	100	125	+52.0		Active	Active	Typical response
3	100	143	+52.0				Typical response
4	0		0.0				
5	100		+51.9				
6	80		+54.5	89			
7	100	100	+51.4	90	Active	Active	Typical response
8			0.0	0			
9	5		0.0	0			No response
10			0.0	0			
11	6		0.0	0			No response
12			0.0	0			
13	30		+19.8	34			
14	100	100	+52.3	83	Active	Active	Typical response
15	100	100	+51.8		Active		Typical response
16	100	100	+50.9				Typical response
17	100	100	+51.0				Typical response
18	100	100	+52.8	100			Typical response
19	100	100	+52.8				Typical response
20			+17.9				
21	100		+51.5				Typical response
22	6		+12.9				
23	12		+11.5	10	Inactive		
24	100		+50.3				Typical response
25	100		+55.4	100	Active	Active	Typical response
26	25	20	+19.1	32			
27	100	100	+51.2	100	Active		Typical response
28	40	40	+11.3				
29	53		+30.5	55			
30	80		+43.3	83			
31	100	100	+50.0		Active		Typical response
32	75		+37.1	66	Inactive		
33	100	100	+52.9				Typical response
34	100	112	+52.0	100	Active		Typical response
35	100		+50.0				Typical response

6 *Postpartum Human Uterus Method*—This constituted the ultimate and specific test for each lot of ergotocin. Although an amount of 0.4 mg. by mouth frequently produced more than the minimal response, this arbitrary dose usually gave rise to definite results in those individuals who were less suitable to the drug. A typical response meant a prompt tetanic contraction in 7 to 8 minutes, followed by rhythmic contractions with an increase in tone, lasting for more than 2 to 4 hours. According to Davis, Adair and their associates (2), about one-half of the multiparous patients can serve as testing subjects.

DISCUSSION

In all respects, the isolated rabbit's uterus method yields numerical figures which are most helpful to the chemist. The oxytocic action typifies ergotocin and eliminates ergotamine and ergotoxine, and the prolonged rhythmic contractions distinguish it from histamine and tyramine, both of which cause brief responses. One can, therefore, regard the isolated rabbit's uterus method, the simplest laboratory test, with considerable degree of specificity. To insure fully the therapeutic value of the product, a clinical assay should be carried out. The postpartum dog's uterus method appears to be less sensitive than the clinical method. The remaining three tests are essential for confirmatory purposes, although they are of secondary importance on account of their lack of specificity. From the above data, it may be suggested that every lot of ergotocin should be first examined polarimetrically, assayed colorimetrically and physiologically by the isolated rabbit's uterus method, and finally, tested clinically. This will result in a uniform product for medical use.

The authors believe that the same methods, in addition to the analytical and chemical, will settle the question of identity or difference between ergotocin on the one hand and the other newer substances from ergot on the other, such as sensibamine of Chinoin Gyógyszer és Vegyeszeti Termékek Gyára, R. T. (8), ergoclain of Kussner (9), ergometrine of Dudley and Moir (10), ergostetrine of Thompson (11), and ergobasine of Stoll and Burckhardt (12) and Jacobs and Craig (13). Comparisons should be made, of course, with the same salt and under the same conditions.

SUMMARY

Thirty-five lots of ergotocin were compared by six methods of testing: the isolated rabbit's uterus, the U. S. P. cock's comb, the polarimetric, the colorimetric, the postpartum dog's uterus and the postpartum human uterus methods. With a few exceptions, the results by the different procedures appear to confirm one another.

Ergotocin may be assayed by the isolated rabbit's uterus method, supplemented by the clinical method. Polarimetric and colorimetric tests may furnish preliminary information concerning the purity of the product, but should always be confirmed by physiological and clinical experiments.

In the light of our present knowledge, the U. S. P. cock's comb method is not specific enough for the assay of ergotocin. The Broom-Clark method is entirely useless for the same purpose.

REFERENCES

- (1) Kharasch M. S., and Legault R. R. *Science* 81, 388 (1935). *J. Am. Chem. Soc.* 57, 956 and 1140 (1935).
- (2) Davis M. E., Adair F. L., Rogers G., Kharasch M. S., and Legault, R. R. *Am. J. Obstet. Gynecol.* 29, 155 (1935).
- (3) Davis M. E., Adair F. L., Chen K. K., and Swanson E. E. *J. Pharmacol. and Exper. Therap.* 54, 398 (1935).
- (4) Adair F. L., and Davis M. E. *Am. J. Obstet. Gynecol.* 27, 383 (1934).
- (5) Broom W. A., and Clark A. J. *J. Pharmacol. and Exper. Therap.* 22, 59 (1923).
- (6) Smith M. I. *U. S. Pub. Health Rep.* 45, 1466 (1930).
- (7) Swanson E. E. *Jour. A. Ph. A.* 23, 867 (1931).
- (8) Chinoin Gyógyszer és Vegyeszeti Termékek Gyára R. T. *Brit. Pat.* 355, 539 (Mar. 2, 1933). *Fr. Pat.* 742, 002 (Mar. 20, 1933).

- (9) Kussner, W, *Arch Pharm* 272, 503 (1934)
- (10) Dudley, H W, and Moir, C, *Brit Med J* 1, 520 (1935)
- (11) Thompson, M R, *Science*, 81, 636 (1935)
- (12) Stoll, A, and Burckhardt, E, *Compt rend acad sci*, 200, 1680 (1935), *Bull sci pharmacol*, 42, 257 (1935)
- (13) Jacobs, W A and Craig L C, *Science* 82 16 (1935)

DRUG EXTRACTION V THE EXTRACTION OF BELLADONNA ROOT WITH GLYCERINIC MENSTRUUA *¹

BY WILLIAM J HUSA² AND LOUIS MAGID

Tests were carried out to determine the efficiency of various glycerin-alcohol-water mixtures in the extraction of belladonna root

EXPERIMENTAL PART

100 Gm portions of belladonna root in No 40 powder were percolated by Type Process B with four different menstrua: (A) alcohol 5 vol—water 1 vol, (B) alcohol 425 vol—water 100 vol—glycerin 75 vol, (C) alcohol 325 vol—water 200 vol—glycerin 75 vol, and (D) alcohol 200 vol—water 100 vol—glycerin 100 vol. The preceding menstrua constituted Menstruum I, 100 cc being used, a mixture of alcohol 5 vol—water 1 vol was used as Menstruum II. In each case the drug was moistened with 60 cc of Menstruum I, and allowed to macerate for 6 hours before packing. The drug moistened with Menstruum A occupied 250 cc after packing while with Menstrua B, C and D the volume after packing was 265 cc. After packing, maceration was allowed to proceed for 24 hours. The percolates were then collected in three fractions, 80 cc, 100 cc and 300 cc, respectively. The first 80 cc was collected at the rate of 10 drops per minute and the remainder of the percolate at 20 drops per minute.

TABLE I—EFFECT OF VARIOUS GLYCERINIC MENSTRUUA ON THE EXTRACTION OF POWDERED BELLADONNA ROOT

Percolate	Grams of Alkaloid in Various Fractions of Percolate Menstruum			
	A	B	C	D
80 cc	0.429	0.420	0.372	0.337
100 cc	0.052	0.066	0.088	0.092
300 cc	0.000	0.000	0.018	0.042
Totals	0.481	0.486	0.478	0.471

DISCUSSION OF RESULTS

The results in Table I show that glycerin retards the extraction of the alkaloids of belladonna root. The retardation increases with increasing concentration of glycerin and with decreasing concentration of alcohol. The results of the tests with glycerinic menstrua uphold the general opinion that glycerin does not aid in the extraction of alkaloidal drugs. Firlas (1) has stated that the presence of glycerin in the menstruum does not affect the amount of alkaloids in fluid extracts of cinchona, hydrastis and ergot. Scoville (2) showed that glycerin in the men-

* Scientific Section, A. P. H. A., Portland meeting 1935

¹ This investigation was aided by a grant from the AMERICAN PHARMACEUTICAL ASSOCIATION Research Fund

² Head Professor of Pharmacy, University of Florida

Distillation of the phenol from 2.5-Gm samples and titration of an aliquot of the distillate yielded

5.34 and 5.37 per cent phenol w/w

CAMPHORATED PHENOL

A sample of camphorated phenol (14) was prepared to contain 32.71 per cent phenol by weight. Suitable assay samples when extracted and assayed in the same manner as phenolated oil yielded

32.49, 32.31, 32.46, 32.38 and 32.35 per cent phenol w/w

PHENOL OINTMENT

An ointment of phenol (15) prepared to contain 2.47 per cent phenol by weight yielded results as follows when samples were assayed as described under phenolated oil

2.34, 2.32, 2.35 and 2.38 per cent phenol w/w

Samples assayed by the method proposed for inclusion in the U. S. Pharmacopœia XI (16) which consists of heating weighed samples at 115° C for 1½ hours and calculating the loss in weight as per cent phenol yielded

3.39, 3.16, 2.55 and 4.42 per cent phenol by weight

Two samples heated for an additional hour at 115° C continued to lose weight. Samples of ointment base heated under the same conditions lost weight as follows

0.44, 0.075, 1.04 and 0.35 per cent

It is evident that some of the base volatilized on heating, and that the method proposed for inclusion in the Pharmacopœia is unsatisfactory.

SUMMARY

1. A number of official phenols containing preparations have been assayed by a modified Koppeschaar method.

2. Glycerite of phenol and phenolated solution of iodine can be assayed directly for phenol after dilution without separating the phenol.

3. Camphorated phenol, phenolated oil and ointment of phenol can be assayed satisfactorily after extraction of the phenol with water.

4. The method of assay for ointment of phenol proposed for inclusion in the U. S. Pharmacopœia XI is subject to variations due to the volatility of the constituents of the ointment base.

REFERENCES

- (1) Rae J. *Pharm J* 124, 239 (1930)
- (2) Deninges G. *Bull Soc pharm Bordeaux* 65, 118 (1929)
- (3) Riegler E. *Chemist and Druggist* 56, 442 (1900)
- (4) Mumford, E. M. *Clem News*, 107, 253 (1913)
- (5) U. S. Pharmacopœia X, 238 (1926)
- (6) Redman L. V. and Rhodes E. O. *Ind Eng Chem* 4, 655 (1912)
- (7) Olivier S. C. J., *Rec trav chim* 28, 354 (1909)
- (8) Corfield C. E. and Mundy L. M. *Quart J Pharm Pharmacol* 5, 504 (1932)
- (9) Baur J. C. *Jour A Ph A* 21, 244 (1932)
- (10) Smelt E. M. *Quart J Pharm Pharmacol* 5, 509 (1932)
- (11) National Formulary VI, galley proof 232 (1935)
- (12) *Ibid* 420 (13) *Ibid* 330 (14) *Ibid* 332
- (15) U. S. Pharmacopœia X, 415 (1926)
- (16) U. S. Pharmacopœia XI Bulletin Subcommittee No 7, 327 (1935)

DATURIC ACID^{1 2}BY RALPH W CLARK³

The name daturic acid was first applied by Gérard in 1890 to an acid obtained from the oil of the seeds of *Datura Stramonium* L. to which he assigned the formula $C_{17}H_{34}O_2$ (1) The pronouncement was received with skepticism because the existence of a homologue of acetic acid with seventeen carbon atoms, though previously made, had also been denied

Thus Chevreul as early as 1811 had isolated an acid, m p 50–60°, from lard to which he assigned the name *acide margarique* (2) However, he admitted that the existence of this acid was not as certain as that of either stearic acid or oleic acid (3) Liebig, in 1840, expressed the view that margaric acid is a combination of oleic and stearic acids (4) Varrentrapp (5), in the same year, obtained like analytical results Like Redtenbacher (6), he prepared his margaric acid by distillation of stearic acid

Fremy (7), in 1840, also claimed that the margaric acid obtained by Felouze and Boudet in 1839 from palm oil was identical with a new acid obtained by him from palm oil which he named palmitic acid This viewpoint was supported by Stenhouse (8) Laurent and Gerhardt (9) held stearic and margaric acids to be different physical modifications of the same acid, $C_{17}H_{34}O_2$, comparable to "l'acide tartrique" and "l'acide metatartrique"

New direction was given in 1851 to the investigation of fatty acids by Heintz (10) who effected a separation of the free fatty acids by fractional crystallization He claimed to have isolated margaric acid, m p 60°, from human fat A year later (11) he reported margaric acid, m p 60°, as principal constituent of spermaceti However, in the same year, 1852, he pointed out in connection with his investigation of mutton-tallow (12) that palmitic and stearic acids yield mixtures with the properties of new acids These mixtures, could not be resolved into the individual acids by recrystallization, but only by fractional precipitation by means of magnesium or barium acetate He therefore regarded margaric acid as a mixture of one part stearic acid with nine or ten parts of palmitic acid He even went so far as to express the opinion that fatty acids with an uneven number of carbon atoms did not occur in natural fats All occurrences of margaric acid previously reported he regarded as mixtures of palmitic and stearic acids The so-called margaric acid found by Collet (13) he recognized as palmitic acid (14)

Such was the state of affairs with reference to a fatty acid with seventeen carbon atoms when daturic acid was discovered Hence its existence as a chemical individual was questioned

A new chapter in the history of daturic acid was opened up in 1912 when Meyer and Beer (15) (after Meyer and Eckert (16) had obtained daturic acid from coffee bean oil), pointed out that their daturic acid, obtained upon fractional crystallization of the lithium salts of the fatty acids of datura oil, was identical with Krafft's synthetic margaric acid The melting point of their acid, 59.5°,

¹ Scientific Section, A Ph A, Portland meeting 1935

² Part of a thesis submitted for the degree of Doctor of Philosophy, University of Wisconsin

1933

³ Instructor in Pharmacy, University of Wisconsin Department of Pharmacy

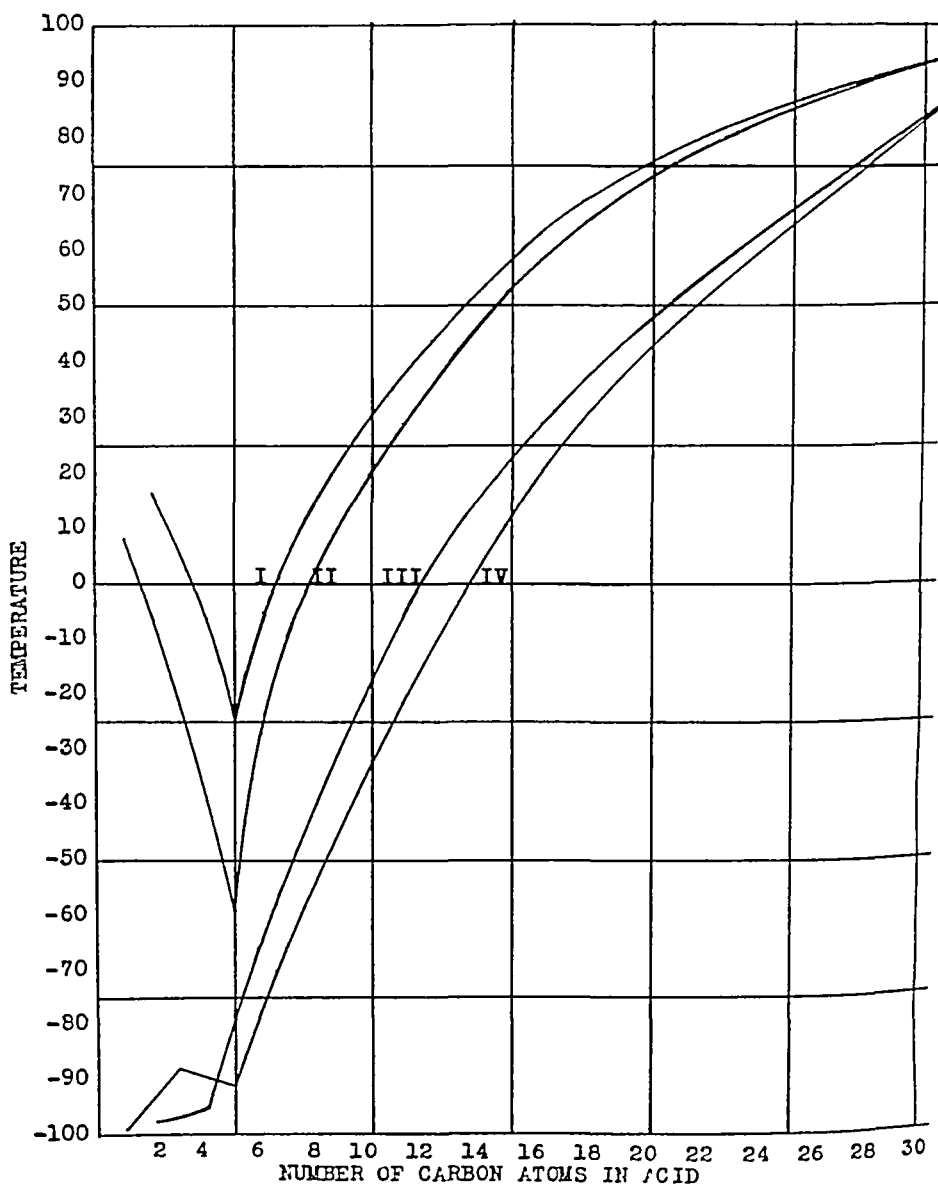


Fig 1—Melting points of fatty acids and their methyl esters. Curve I Fatty Acids Having an Even Number of Carbon Atoms, II Odd Number, III Methyl Esters of Fatty Acids Having an Even Number of Carbon Atoms, IV Odd Number. The Curves were prepared from data obtained from Reid College Organic Chemistry 223 and 200 (1929) Lowkowitz Chem Tech Fats Oils and Waxes 1 117 (1921) Levenne and Taylor *J Bio' Chem* 69 921 (1924) Beilstein Handbuch der Org Chem ' 2 7-186 (1929) and earlier editions International Critical Tables. A great variation in melting points was observed in the literature mentioned above. The curves were prepared from most frequently appearing melting points and averages of melting points from the five sources.

remained unchanged when a mixed melting point was taken. In the introduction to their report, the authors review the literature concerning acids with an odd number of carbon atoms reported since the pronouncement by Heintz. They point out that upon repetition of most of the work, careful fractionation of the reported acids resulted in the separation of acids with higher as well as lower melting points. Hence no confidence can be placed in the occurrence of heptadecylic acid in either animal or vegetable kingdom.

Boemer and Limprich found daturic acid to agree with synthetic heptadecylic acid in all its properties (17). Ruttan (18) also prepared heptadecylic acid artificially. In 1916 Jacobson and Holmes (19) obtained from alfalfa seed oil an acid which melted at 59.6° to 59.8° , and had a neutralization value of 207.5, hence corresponding with daturic acid of Meyer and Beer and the synthetic margaric acid of Krafft.

Lewkowitsch (20), therefore, considers the existence of daturic acid as proven.

Since then Dieterle in 1926 obtained from *Datura alba* an acid which, after fractional crystallization and precipitation, melted at $55-56^{\circ}$ and which, in other respects corresponded with daturic acid (21). However, Heiduschka and Luft (22) claim that the solid acid, from *Oenothera biennis*, which resembled the so-called daturic acid, could be resolved into palmitic acid and an acid with a higher number of carbon atoms. More recently Dieterle and co-workers (23) in an attempt at the better characterization of daturic acid, obtained from ergot, have prepared not only the magnesium salt and the methyl and ethyl esters but also the hydroxamic acid.

Such is the situation with reference to daturic acid. It is the more unsettled since Shriner, Fulton and Burks, Jr. (24) point out that the equimolecular mixture of palmitic and stearic acid may be mistaken for margaric acid and that mixed melting points are not conclusive evidence for identification.

MELTING POINT

The fatty acids are important chemical compounds and have been the subject of an almost endless number of investigations. It has been customary to determine the melting point for their characterization. So many melting points have been reported in the literature in many cases that the value of the property is greatly lessened. Because of the variation in melting points the writer has prepared curves of the melting points of fatty acids and their methyl esters.

The melting points of the fatty acids having an even number of carbon atoms (Curve I) are somewhat higher than those with an odd number (Curve II). The data, in the case of the methyl esters, are not as complete as those of the acids except in the lower esters. The melting points of the esters of acids having an even number of carbon atoms (Curve III) are also higher than those with an odd number (Curve IV). In both cases when the curves are plotted side by side they are nearly parallel, approaching or crossing at about thirty carbon atoms.

The melting point of daturic acid is generally reported as 59.9° , varying, however, from 54° to 60° . This point does not fall on the curve. According to the curve this melting point should be about 61° . The melting points of palmitic and stearic acids reported in the literature vary somewhat and several writers

report a melting point below the curve, but several also report a melting point which falls on the curve, namely, 64° and 71° , respectively

The melting point of the methyl ester of daturic acid is reported as 29° to 30° . This point is slightly above the curve and probably should be nearer 28° unless that portion of the curve is plotted too low, due to lack of sufficient data. The melting point of the methyl ester of palmitic acid is reported as from 27° to 30° by several observers. The curve passes between these two points. The methyl ester of stearic acid is reported as from 38° to 40° . The curve also passes between these two points. Probably these melting points of the esters of palmitic and stearic acid reported are very nearly correct while that of daturic acid methyl ester is somewhat high. Round numbers have been used for the melting points of substances in this discussion for the purpose of illustrating the values of the curves.

EXPERIMENTAL

Ground seeds of *Datura Stramonium* purchased from S. B. Penick and Company were exhausted with 95 per cent alcohol. The alcohol was recovered by distilling under reduced pressure. The extracted material was shaken out with petroleum ether which was recovered leaving the fatty oil.

The oil was then saponified using a 10 per cent excess of KOH in 70 per cent alcohol. The alcohol having been recovered the non saponifiable material was removed by means of ether. The non saponifiable portion was studied by Givold (25) who reported that it contained sitosterol.

The liquid fatty acids were separated from the solid fatty acids by means of the Lead Salt Ether method (26). In this manner 1483 Gm. of solid fatty acids were obtained from 6550 Gm. of oil extracted from 35.4 Kg. of *Stramonium* seeds representing 22.6 per cent of the oil used or 4.2 per cent of the seeds used.

Negative results were obtained in attempts to separate the solid fatty acids by fractional crystallization from alcohol, fractional precipitation of the magnesium salts and vacuum distillation of the methyl esters.

CONCLUSIONS

The methods of separation referred to above are the ones formerly used and the negative results obtained point to the need of application of the studies in the identification of synthetic fatty acids by means of other derivatives such as were used by Reid (27) and his co-workers, Whitby (28) and others. The work of Francis, Piper and Malkin (29) in which they give the results of X-ray examinations of various fatty acids, synthetic and natural, could also be used with interest in the study of daturic acid, the identity of which is not yet firmly established in the minds of all investigators.

The writer wishes to express his appreciation to Professor Edward Kremers for his guidance in this work.

REFERENCES

- (1) Gerard E. C. R. 111 305 (1890) *Ann. Chim. Phys.* 6 27, 549 (1892)
- (2) Chevreul M. 'Recherches Chimiques Sur Les Corps Gras D'Origine Animale' Edition Imprimerie Pour Le Centenaire De 1789 ' 62 (1886)
- (3) *Ibid.* 364
- (4) Liebig J. *Ann. d. Chem.* 33 1 (1840)
- (5) Varrentrapp F. *Ibid.* 35 65 (1840)
- (6) Redtenbacher J. *Ibid.* 35 46 (1840)
- (7) Fremy E. *Ibid.* 36 44 (1840)
- (8) Senhouse J. *Ibid.* 36 50 (1840)

- (9) Laurent, A, and Gerhardt, C, *C R*, 28, 400 (1849)
- (10) Heintz, W, *Pogg Ann*, 84, 238 (1851)
- (11) Heintz, W, *Ibid*, 87, 21 (1852)
- (12) Heintz, W, *Ibid*, 87, 353 (1852)
- (13) Collet J, *J prak Chem*, 64, 108 (1855)
- (14) Heintz W *Ibid* 111
- (15) Meyer, H, and Beer, R, *Monatsh*, 33, 311 (1912)
- (16) Meyer, H, and Eckert, A *Ibid*, 31, 1227 (1910)
- (17) Boemer, A, and Limprich, R, *Zeitsch Untersuch Nahrungs-u Genussmittel*, 23, 641 (1912)
- (18) Ruttan, R, 'Eighth Intern Cong of Appl Chem,' 25, 431 (1919)
- (19) Jacobson, C, and Holmes A *J Am Chem Soc*, 38, 480 (1916)
- (20) Lewkowitsch, J "Chem Techn of Oils Fats and Waxes" 1 115 and 165 (1921)
- (21) Dieterle, H, *Archiv Pharm*, 264, 141 (1926)
- (22) Heiduschka, A and Luft, K, *Ibid*, 257, 33 (1919)
- (23) Dieterle H Diester, H, Thumann T, *Ibid*, 265, 171 (1927)
- (24) Shriner, R Fulton, J, Burks D, Jr, *J Am Chem Soc*, 55 1494 (1933)
- (25) Gisvold O, *Jour A Ph A*, 23, 106 (1934)
- (26) Lewkowitsch, J, *Chem Tech Fats Oils and Waxes*, 1, 556 (1921)
- (27) Reid, E E, and co workers *J Am Chem Soc*, 39, 124 (1917), and subsequent volumes of *J Am Chem Soc*
- (28) Whitby, G S, *J Chem Soc*, 129, 1458 (1926)
- (29) Francis, F, Piper, S, Malkin T *Proc Roy Soc of London, A*, 128, 214 (1930)

STUDIES ON BARBITURATES XI FURTHER CONTRIBUTIONS TO METHODS OF BARBITAL RESEARCH *

BY CHARLES R LINEGAR, JAMES M DILLE AND THEODORE KOPPANYI ¹

In a previous publication (1), we discussed different methods of extraction of barbiturates from urine, blood and tissues and also colorimetric methods for the estimation of barbiturates. From time to time we have received requests from other laboratories relative to certain difficulties encountered during the process of extraction of barbiturates, and although little difficulty is usually encountered in using the methods described in previous publications it was deemed advisable to improve this part of the procedure. This paper embodies the results of investigations devoted to the problem of the extraction of barbiturates.

URINE

Methods of Clarification—Chloroform extracts of pathological and even normal urine specimens are sometimes highly colored with urochrome and other pigments ². These materials may interfere with the colorimetric readings as described in the quantitative procedure of Koppanyi, *et al* (1). Ordinarily, if it is not necessary

* Scientific Section, A Ph A, Portland meeting, 1935

¹ From the Department of Pharmacology and Materia Medica, Georgetown University, School of Medicine, Washington, D C

² The interfering colored residues found in the evaporated chloroform extract need not represent urinary pigment, but may be due to some colored impurities present in the chloroform. In order to prevent this the chloroform used for extraction should be checked for such impurities by evaporating 100 to 200 cc to dryness. If these impurities are present the chloroform can be purified by distillation.

to concentrate the chloroform extract, colorimetric determinations may be carried out without removal of the pigments. However, in certain urines so much pigment is extracted that it is impossible to carry out colorimetric readings either directly or after concentration. Also, when the barbital content of the urine is very low and it is necessary to evaporate the extract to dryness, the amount of pigment which is taken up with the small amount of chloroform to carry out the test may be enough to prevent a satisfactory estimation of barbital and its derivatives.

Various procedures have been tried for clarifying highly colored urines before extraction with chloroform. The first requirement of any one of these methods is that it must not change the actual concentration of barbiturates in the urine, i. e., precipitate, adsorb or destroy these compounds. Secondly, it must remove sufficient pigment so that the final color development is not obscured, and it should not yield end-products, such as acetic acid from lead acetate, which have a deterrent action on the subsequent color development.

Our methods of extraction of barbiturates from the urine described previously (1, 3) fulfil these requirements for ordinary purposes, and only highly concentrated urine samples show pigments with the alkaline copper sulphate precipitation method. We believe that the difficulties with this method arise largely from the fact that copper sulphate and sodium hydroxide are not used in sufficient amounts to produce a heavy precipitation of the mixture. The heavily precipitated urines yield little if any pigments. We have endeavored, however, to improve even upon this alkaline copper sulphate precipitation method and have experimented with a number of other methods in an attempt to more completely remove the pigments from the urine without destroying or removing the barbiturates.

In this investigation, sodium barbital was added to pathological, highly pigmented normal urine specimens, and urines which had been concentrated on a water-bath. These urines were cleared by one of the methods described below and aliquots of the filtrate extracted with ten volumes of chloroform, the chloroform extract filtered and evaporated to dryness. Control urines, i. e., urines not cleared or urines cleared by other methods, were similarly treated in each case and the amount of the urinary pigment remaining in the evaporating dish after the evaporation of chloroform noted and compared. This residue was then dissolved in small volume of chloroform and the amount of barbital extracted was determined by the colorimetric procedure. Thus every method was checked not only as to its ability to remove pigment but also as to its efficiency in preserving the original barbital content of the urine.

The following new methods were used to clear the urine for the determination of barbiturates.

A Sufficient amounts of *bichloride of mercury* are added to urines until heavy white precipitation occurs. The precipitate is filtered off and an aliquot of the filtrate extracted with chloroform. Although considerable pigment was removed by this method, it did not prove to be practical because large amounts of barbital were precipitated and probably destroyed by this method.

B Enough *zinc sulphate* and *sodium hydroxide* is added to urines to produce heavy precipitation of zinc hydroxide. Although this method did not affect the barbital content of the urine, it was found to be rather ineffective in removing pigments.

C Two grams of *sodium molybdate* are added to every 25 cc of urine and sufficient *strong sulphuric acid* (20 to 30 per cent) to produce a heavy green precipitate. The precipitate is filtered off and the filtrate extracted, as usual, with chloroform. This method did not destroy the barbitol added to the urine, and was found to be effective in removing pigments from certain concentrated urine specimens. However, it was inferior to the method finally chosen and described below.

D Five cc of a 10 per cent *copper sulphate* solution are added to 25 cc of urine which is then made alkaline with 10 cc of a 10 per cent *sodium tungstate* solution. After mixing thoroughly, the mixture is filtered and 5 cc of 5 per cent *sulphuric acid* solution is added to 30 cc of the filtrate. This is mixed, allowed to stand for about twenty minutes and again filtered. Twenty-five (25) cc of this filtrate, which is equivalent to 13.39 cc of the original urine, is extracted with chloroform. More pigment will be removed by this method if the amounts of reagents used for the 25 cc of urine are doubled. This latter procedure has the disadvantage, however, of requiring a much longer time for filtration.

This method was compared with the original alkaline copper sulphate precipitation method and was found to be its equal in lightly colored urines. However, in highly colored urine specimens this method removed more pigment than any other method. No barbitol was removed during this procedure.

Extraction of Diethyl Barbituric Acid from Alkaline Urine—In a previous publication, we stressed the fact that urines or the cleared filtrates must be acidulated before extraction. This was a necessary precaution because the alkaline salts of barbituric acids are insoluble in chloroform. However, we observed repeatedly that alkaline urines not acidulated before extraction showed the presence of barbituric acids in the chloroform extracts. This led us to suspect that some of the excreted barbiturates are present as acids even in alkaline urines. A typical experiment demonstrating the above fact is described below.

Dog Female, 11.4 Kg, given by femoral vein, 1650 mg per Kg of sodium barbitol in divided doses with picrotoxin. Died 1 hour and 25 minutes after the last injection.

The urine excreted during this period was secured by catheterization of the bladder and its p_H was found to be 7.5 by indicators.

Ten cc of the urine was extracted directly without acidulation with ten volumes of chloroform. The colorimetric determination showed that the extract contained 0.4 mg of barbitol per cc.

Another 10 cc of the same urine was acidulated with dilute sulphuric acid and extracted with ten volumes of chloroform. The colorimetric test showed in this case the presence of 0.6 mg of barbitol per cc of the extract.

We endeavored to duplicate these results by adding various amounts of sodium barbitol (an alkaline salt) to portions of alkaline rabbit and human urines which had a p_H of 8.0 as determined by the use of indicators. Ten-cc portions of each concentration were extracted directly, without acidulation with 100 cc of chloroform and this chloroform was then tested for barbitol. The results of one of these experiments on rabbit urine are summarized in Table I.

It can be seen that the amount of barbitol recovered is inversely proportional to the amount of sodium barbitol added to the urine. Sodium barbitol added to

distilled water which was adjusted to p_H 8.0 was not changed into barbital and the chloroform used to extract this solution gave negative tests for barbiturates throughout the experiment

TABLE I—THE EXTRACTION OF BARBITAL FROM ALKALINE RABBIT URINE (p_H 8.0) TO WHICH VARYING AMOUNTS OF SODIUM BARBITAL HAVE BEEN ADDED

Amount of Sodium Barbital Added to Urine Mg per Cc	Amount Recovered as Barbital Mg per Cc	Percentage Conversion of Sodium Barbital to Barbital Per Cent
0.5	0.25	50
1.0	0.50	50
2.0	0.80	40
3.0	1.20	40
5.0	1.50	30
10.0	2.50	25
10.0*	Negative	0

* Dissolved in distilled water p_H 8.0

BLOOD

The modified Folin-Wu method for blood precipitation gives such uniform results and clear extracts that no further improvements are deemed necessary. However, we have never extracted volumes of blood larger than 20 to 30 cc and thus have not tested the pigment removing capacity of the Folin-Wu method for large amounts of blood. Two hundred cc of freshly drawn oxalated dog blood were precipitated by adding 200 cc of 10 per cent sodium tungstate and 400 cc of $\frac{2}{3}$ normal sulphuric acid solutions. The filtrate (485 cc) was evaporated on a water-bath until it reached a volume of 75 cc and was then extracted with ten volumes of chloroform. This chloroform extract evaporated to dryness showed no pigments.

Incidentally we endeavored to check the specificity of our barium hydroxide and lithium hydroxide tests on this evaporated extract¹. The evaporated residue of the total blood extract was taken up in 10 cc of chloroform and tested colorimetrically. Negative results in all three ranges of the micro (lithium hydroxide) and in the first range of the macro (barium hydroxide) tests were noted.

TISSUES

The alkaline copper sulphate precipitation method and the liquid air method described previously (1) suffice for the study of the barbital concentration of organs. We want to emphasize again, however, that with the alkaline copper sulphate precipitation method the best results are obtained if the proportions of copper sulphate and sodium hydroxide solutions are such as to change the liquefied tissues to a heavy, massive, semi-solid mixture.

The liquid air method, as emphasized elsewhere (1), gives the best yield of barbiturates. However, this method cannot be applied to the extraction of barbiturates from the central nervous system, because as already observed (2) the

¹ The colorimetric test for barbiturates cannot be carried out in ether. The addition of the reagents to an ether extract produces dirty precipitates of miscellaneous hues but no clear cut blue colors. Therefore if ether is used as the extractive medium, it must be evaporated off and the residue taken up in chloroform for testing.

lecithins and cephalins of the central nervous system are easily soluble in chloroform and interfere with the development of color in the test for barbiturates

Recently, we found a simple method which allowed us to estimate the barbiturate content of the brain by using the liquid air method. Brain tissue is frozen in liquid air and pulverized. This powdered brain tissue is shaken with chloroform, the chloroform extract is filtered and evaporated to dryness on a water-bath, and the residue taken up again in a small volume of chloroform to which acetone is added drop by drop. A heavy precipitation of phospholipids occurs in the solution. The precipitate is filtered off and acetone is added again to the filtrate to ascertain whether the phospholipids have been completely removed. The solution in which no more precipitation occurs with acetone is again evaporated to dryness, and the residue taken up with chloroform and tested. In properly treated extracts, the test can be carried out without interference.

DISCUSSION

The additional methods described for the clarification of urine will probably be useful to those who are working with pathological or highly concentrated urines. It is recommended that before discarding a urine sample as unsuitable for colorimetric estimation of barbiturates all three methods for clarification, namely, the copper sulphate, the sodium molybdate, and the copper sulphate-sodium tungstate methods, should be tried. There will be very few urines, indeed, which when appropriately cleared could not be used for the quantitative estimation of barbiturates.

We have shown that the urine has the capacity even at a relatively high p_H of converting sodium barbital into the acid form. The amount of sodium barbital added to alkaline urines and recovered as diethyl barbituric acid is inversely proportional to the amount originally added. It is evident that there is a buffering action of the urine which changes a portion of sodium barbital to barbital, thus making it available for extraction with chloroform. This buffering power of the urine is almost constant since the percentage of barbital formed from the alkaline salt decreases as the amount of added sodium barbital increases. This characteristic of the urine has not been previously observed as far as barbiturates are concerned, but we have described the same phenomenon concerning the blood (3). We conclude, therefore that both blood and urine have the capacity to convert sodium barbital into barbital.

We have shown that even large amounts of blood can be extracted with chloroform without the slightest trace of pigments in the extract. We have also shown that even such large volumes of blood, if the extract is evaporated to dryness and then taken up in a very small volume of chloroform, contain no substance which reacts in our macro or micro tests to give a blue color. These tests, therefore, can be safely used in the diagnosis of barbiturate poisonings.

The liquid air extraction method for other tissues is now extended to the brain, if the phospholipids are removed with acetone. This not only provides a very convenient and rapid method for the extraction of barbiturates from the central nervous system, but also shows that our assumption expressed in the previous communication (2) that lecithins interfere with the colorimetric estimation of barbital, was correct.

distilled water which was adjusted to p_H 8.0 was not changed into barbital and the chloroform used to extract this solution gave negative tests for barbiturates throughout the experiment

TABLE I—THE EXTRACTION OF BARBITAL FROM ALKALINE RABBIT URINE (p_H 8.0) TO WHICH VARYING AMOUNTS OF SODIUM BARBITAL HAVE BEEN ADDED

Amount of Sodium Barbital Added to Urine Mg per Cc	Amount Recovered as Barbital Mg per Cc	Percentage Conversion of Sodium Barbital to Barbital Per Cent
0.5	0.25	50
1.0	0.50	50
2.0	0.80	40
3.0	1.20	40
5.0	1.50	30
10.0	2.50	25
10.0*	Negative	0

* Dissolved in distilled water, p_H 8.0

BLOOD

The modified Folin-Wu method for blood precipitation gives such uniform results and clear extracts that no further improvements are deemed necessary. However, we have never extracted volumes of blood larger than 20 to 30 cc and thus have not tested the pigment removing capacity of the Folin-Wu method for large amounts of blood. Two hundred cc of freshly drawn oxalated dog blood were precipitated by adding 200 cc of 10 per cent sodium tungstate and 400 cc of $\frac{2}{3}$ normal sulphuric acid solutions. The filtrate (485 cc) was evaporated on a water-bath until it reached a volume of 75 cc and was then extracted with ten volumes of chloroform. This chloroform extract evaporated to dryness showed no pigments.

Incidentally we endeavored to check the specificity of our barium hydroxide and lithium hydroxide tests on this evaporated extract.¹ The evaporated residue of the total blood extract was taken up in 10 cc of chloroform and tested colorimetrically. Negative results in all three ranges of the micro (lithium hydroxide) and in the first range of the macro (barium hydroxide) tests were noted.

TISSUES

The alkaline copper sulphate precipitation method and the liquid air method described previously (1) suffice for the study of the barbital concentration of organs. We want to emphasize again, however, that with the alkaline copper sulphate precipitation method the best results are obtained if the proportions of copper sulphate and sodium hydroxide solutions are such as to change the liquefied tissues to a heavy, massive, semi-solid mixture.

The liquid air method, as emphasized elsewhere (1), gives the best yield of barbiturates. However, this method cannot be applied to the extraction of barbiturates from the central nervous system, because as already observed (2) the

¹ The colorimetric test for barbiturates cannot be carried out in ether. The addition of the reagents to an ether extract produces dirty precipitates of miscellaneous hues but no clear cut blue colors. Therefore, if ether is used as the extractive medium, it must be evaporated off and the residue taken up in chloroform for testing.

lecithins and cephalins of the central nervous system are easily soluble in chloroform and interfere with the development of color in the test for barbiturates

Recently, we found a simple method which allowed us to estimate the barbiturate content of the brain by using the liquid air method. Brain tissue is frozen in liquid air and pulverized. This powdered brain tissue is shaken with chloroform, the chloroform extract is filtered and evaporated to dryness on a water-bath, and the residue taken up again in a small volume of chloroform to which acetone is added drop by drop. A heavy precipitation of phospholipids occurs in the solution. The precipitate is filtered off and acetone is added again to the filtrate to ascertain whether the phospholipids have been completely removed. The solution in which no more precipitation occurs with acetone is again evaporated to dryness, and the residue taken up with chloroform and tested. In properly treated extracts, the test can be carried out without interference.

DISCUSSION

The additional methods described for the clarification of urine will probably be useful to those who are working with pathological or highly concentrated urines. It is recommended that before discarding a urine sample as unsuitable for colorimetric estimation of barbiturates all three methods for clarification, namely, the copper sulphate, the sodium molybdate, and the copper sulphate-sodium tungstate methods, should be tried. There will be very few urines, indeed, which when appropriately cleared could not be used for the quantitative estimation of barbiturates.

We have shown that the urine has the capacity even at a relatively high p_H of converting sodium barbital into the acid form. The amount of sodium barbital added to alkaline urines and recovered as diethyl barbituric acid is inversely proportional to the amount originally added. It is evident that there is a buffering action of the urine which changes a portion of sodium barbital to barbital, thus making it available for extraction with chloroform. This buffering power of the urine is almost constant since the percentage of barbital formed from the alkaline salt decreases as the amount of added sodium barbital increases. This characteristic of the urine has not been previously observed as far as barbiturates are concerned, but we have described the same phenomenon concerning the blood (3). We conclude, therefore that both blood and urine have the capacity to convert sodium barbital into barbital.

We have shown that even large amounts of blood can be extracted with chloroform without the slightest trace of pigments in the extract. We have also shown that even such large volumes of blood, if the extract is evaporated to dryness and then taken up in a very small volume of chloroform, contain no substance which reacts in our macro or micro tests to give a blue color. These tests, therefore, can be safely used in the diagnosis of barbiturate poisonings.

The liquid air extraction method for other tissues is now extended to the brain, if the phospholipids are removed with acetone. This not only provides a very convenient and rapid method for the extraction of barbiturates from the central nervous system, but also shows that our assumption expressed in the previous communication (2) that lecithins interfere with the colorimetric estimation of barbital, was correct.

SUMMARY

1 Two practical methods of clearing highly colored urines for the purpose of quantitative estimations of barbiturates are described

2 The urine has a limited buffering capacity manifested in the conversion of sodium barbital into the acid form even in alkaline urines The amount of barbital so converted is inversely proportional to the amount of sodium barbital originally added to the urine

3 Large volumes of blood (after Folin-Wu precipitation) may be extracted with chloroform without obtaining interfering materials in the chloroform extract even after concentration

4 The liquid air method of direct extraction of barbiturates can now be applied to the central nervous system after removing the phospholipids from the chloroform extract with acetone

REFERENCES

- (1) Koppányi, Dille, Murphy and Krop, *Jour A Ph A*, 23, 1074 (1934)
- (2) Koppányi, Dille and Krop, *J Pharmacol and Exper Therap*, 52, 121 (1934)
- (3) Koppányi, Murphy and Krop, *Arch intern Pharm Therap* 46 76 (1933)

A PLAN FOR PHARMACY INTERNSHIPS AT THE UNIVERSITY OF MICHIGAN HOSPITALS *

BY HARVEY A K WHITNEY¹ AND E C WATTS²

Pharmacy as a profession is unquestionably suffering influences that are tending toward pronounced changes It will not be argued here that pharmacy is or is not wholly conscious of the drift Certain it is, however, that the authors feel their incapability of intelligent argument or prediction

Since words have been spoken and written it has been charged that many things are wrong with pharmacy It has been said that the profession requires fewer and better pharmacists, fewer and better pharmacies and fewer and better schools of instruction Professional mediocrity does exist within the rank and file of pharmacists and likewise professional morals and business standards are frequently unobserved This condition reflects to the disadvantage of the public and the physician Others have claimed that colleges of pharmacy should not and cannot be required to turn out a finished professional and business product This reflects to the disadvantage of the pharmacist For comparison it is argued that medical men do not expect such finished products to be graduated from medical schools However, there are those in the medical profession who recognize this deficiency and consequently make some provision toward a remedy One needs only mention the general requirement of service as intern before the graduate physician is licensed to practice medicine It is because the authors sense the same deficiency in pharmacy that the outline of service that follows is proposed for our hospital group

* Section on Practical Pharmacy and Dispensing A Ph A Portland meeting 1935

¹ Chief Pharmacist

² Assistant Chief Pharmacist

A competent and well-organized pharmacy is an essential part of every large modern hospital. In operation it becomes necessary that the hospital pharmacy properly appreciate its duties and privileges in the matter of pharmaceutical and medical education. Medical education, yes, for pharmacy still remains a branch of the practice of medicine. Moreover, and especially if a unit of an important teaching institution, the rôle of the hospital pharmacy attains a superior position in such endeavors. It is therefore the further purpose of this plan to provide at once for the hospital pharmacy as an efficiently functioning service unit and an educational unit for training such graduates in pharmacy as may be interested in postgraduate practical and professional services. Some experience with this proposed plan has been had in the past through the unannounced policy of engaging for duty only recent graduates of the University College of Pharmacy. These individuals have been appointed after being encouraged to believe it would be possible to gain considerable valuable experience. Generally successful efforts have resulted from the subsequent attempts to find permanent places for such experienced "interns."

It is therefore proposed that the personnel of the Hospital Pharmacy be constituted and appointed in accordance with the following scheme

A Permanent (Staff) Employees			B Temporary (Term) Employees		
	No			No	
1 Chief Pharmacist	1	1 Pharmacist, Master Grade		2	
2 Assistant Chief Pharmacist	1	2 Pharmacist Senior Grade		2	
3 Pharmacist-Secretary	1	3 Pharmacist, Junior Grade		2	
		4 Pharmacy Assistants, nonregistered		0	

It may be taken for granted that the functions and duties of the permanent employees will be well understood. It is anticipated the term employees will be selected from a list of approved applicants. An approved applicant is defined as a recent graduate of one of the member schools of the American Association of Colleges of Pharmacy. It may be further understood that applicants from the University of Michigan will be shown first favor. Such an applicant when accepted will receive an appointment as Junior Grade Pharmacist, enduring for one year. If this probationary period is successfully passed the candidate will be re-appointed for a second year as Senior Grade Pharmacist. At the completion of the internship, he may, if he so desires, apply for the third year of postgraduate instruction leading to the award of Master Hospital Pharmacist. It is anticipated further that candidates receiving the certificate of Master Hospital Pharmacist will merit the respect of the entire staff of the University Hospital and that this institution will offer all possible help, that he may put to practical use the information and experience acquired during his residence.

The experiences and services offered to the pharmacy intern will be of that order peculiar to the hospital pharmacy and representative of the highest order of professional practices. Since the hospital pharmacy in fact and influence reaches into practically every department of the hospital it is a matter of considerable concern that this department's operative skill and "end-products" be flawless and faultless. In many instances the responsibility centered in the chief pharmacist will of necessity be divided to some degree among the junior staff members, generally in extent compatible with their grade. The major departmental work

is divisible by the number of grades in the term group and is separable into particular endeavors for rotating service. Such segregations may include, for example, magistral pharmacy, galenical and official preparations, colloidal, isotonic and parenteral solutions, and analytical and control work. Particular attention is also given to bacteriological procedures, sterilizing processes, hydrogen-ion concentration, laboratory reagents and solutions, surgical dressings and preparations and the modern *materia medica* (including clinical evaluations of experimental material).

Further, since it is the prescription that unites the pharmacist and the physician in the medical arts, particular stress is laid upon the interpretation of such orders. Prescriptions may be properly interpreted upon the basis of intent, bringing into consideration all known facts pertinent or relating to the drug and the patient. It is further contemplated that service will include a directed program of extramural work. Such efforts, essays, reports and reviews will be regularly presented to all members of the staff in regular meetings. Material regarded, by the staff, as of importance to the other departments of the hospital will be submitted thereto for disposition.

It necessarily follows that the adoption of such a plan should also include a definite schedule of remuneration for the individual. It is obvious, despite the attractiveness of the type of work, the graduate student will regard such employment as competitive, and to meet the competitive phase and to maintain the attractiveness of the offer provides no small problem. It is quite generally agreed, to attract graduates of a higher order, that current professional wage scales will have to be paid. In this respect comparisons with medical internships offer a severe change.

A CHEMICAL STUDY OF SULPHUR OINTMENT

BY LEWIS C. BRITT *

The industrial, biological and medicinal importance of sulphur have made its quantitative determination a common laboratory procedure. Sulphur has been used as a remedial agent since antiquity and still enjoys popular recognition. Notwithstanding the medicinal importance, little attention seems to have been given to the quantitative determination of sulphur when combined with a fatty base.

Among samples submitted for analysis at the Oregon Board of Pharmacy Drug Laboratory were several of sulphur ointment. These samples were obtained through counter purchases (not prescriptions) made by inspectors in drug stores, which were variously located in the state. A survey of the literature revealed no satisfactory method for a gravimetric determination of sulphur in this preparation. Elsdon (1) has recommended the oxidation of the sulphur to sulphur trioxide by a mixture of bromine and nitric acid, removal of the fat from the resulting mixture by ether extraction, and a gravimetric determination of the sulphur trioxide in the aqueous solution by barium chloride precipitation. The details for conducting the method and data for known samples were not given. The

* Assistant Professor of Pharmaceutical Analysis, Oregon State Agriculture College, School of Pharmacy, Corvallis, Ore

method was said to give satisfactory results but the reader is not informed as to the significance of this statement. An attempt to determine the accuracy of the method was abandoned due to inability to control the offensive and dangerous bromine vapors.

Volumetric methods for the determination of sulphur in organic combination and mixtures are more numerous. Upton (2), Castiglioni (3) and Allport (4) have suggested volumetric methods and since the completion of this study Fleck and Ward (5) have suggested yet another.

The following method has been found to give dependable results for the determination of sulphur in sulphur ointment.

Treat about one Gm. of the well-mixed and accurately weighed ointment with 50 cc. of 10 per cent potassium hydroxide solution, boil gently until the lard is saponified and the sulphur converted to soluble sulphides (usually about one half hour). Add 50 cc. of solution of hydrogen peroxide and digest slightly below the boiling point for thirty minutes. Make slightly acid with hydrochloric acid free of sulphur trioxide, heat to boiling, cool, filter and wash the vessel used in the saponification and the filter paper with distilled water. Determine the sulphur trioxide in the filtrate by barium chloride precipitation in the usual way. Correct the resulting weight of barium sulphate by a blank run on the solutions of hydrogen peroxide and potassium hydroxide and multiply the final weight of barium sulphate by 0.1373 to obtain the equivalent weight of sulphur.

After the oxidized solution has been made acid it must be heated to boiling to drive the fatty acids to the surface of the liquid and then thoroughly cooled to allow them to solidify, so they may be removed by filtration. If the fatty acids are allowed to enter the filtrate they will form insoluble barium salts which will cause the result of the analysis to run high.

A blank must be conducted to determine the sulphur trioxide in the alkali and peroxide solutions. If the method is run frequently, considerable time may be saved by standardizing the reagents in quantity and omitting the blank with each sample. The possibility that lard should be included in the blank was suggested and tests were run to ascertain the possibility of error from this source. The samples of benzoinated lard (U. S. P.) examined were found to average 0.0002 Gm. of barium sulphate per Gm. of lard, equivalent to 0.0000275 Gm. of sulphur. This amount is considered negligible and it is not thought to be necessary to include lard in the blank.

The accuracy of the method was determined from analyses conducted on sulphur ointments of known strength. The sulphur used in these preparations assayed 99.576 per cent pure by the U. S. P. X method. The efficiency of the method may be judged by the results in Table I.

Satisfactory results were also obtained with the method by students who ran an analysis of sulphur ointment as a laboratory experiment in courses in drug analysis.

EXAMINATION OF COMMERCIAL OINTMENTS

A total of thirteen samples of sulphur ointment, collected by drug inspectors from various stores in Oregon, have been examined. With the exception of two, all samples were prepared extemporaneously in the stores. Only three of the samples were found to contain from 14.5 to 15.5 per cent sulphur by weight in benzoinated lard, which were considered to be U. S. P. requirements. In the remaining samples

the amount of sulphur was found to vary from 13.0 to 22.467 per cent by weight and six of these were made with petrolatum base

TABLE I

Sample No	Wt of Sample	Per Cent Sulphur Added	Per Cent Sulphur Found	Difference
1	1.6076	7.673	7.666	0.007
1	1.8044	7.673	7.763	0.090
2	1.6741	8.916	8.921	0.005
2	1.7561	8.916	9.029	0.113
2	0.8499	8.916	8.918	0.002
3	0.7670	14.489	14.491	0.002
3	1.1902	14.489	15.505	0.016
3	0.7748	14.489	14.628	0.139
4	1.0785	16.348	16.446	0.098
4	1.0511	16.348	16.350	0.002
4	0.9964	16.348	16.366	0.018

CONCLUSIONS

1 A workable method, suitable for the gravimetric determination of sulphur ointment, has been devised

2 The number of samples of sulphur ointment examined indicates a tendency on the part of retail pharmacists to substitute petrolatum for benzoated lard, as 46 per cent of those examined were made with petrolatum base

3 If the ointment requires petrolatum or wax to render it stable, their effect on the therapeutic value of the preparation should be determined, to allow for their addition if possible

4 A study of the stability of the official ointment and ointments prepared with varying amounts of petrolatum and wax would be of interest

REFERENCES

- (1) Elsdon G D *The Analyst*, 47 197-202 (1922)
- (2) Upton *Ind Eng Chem*, 10 518 (1918)
- (3) Z Castiglioni, *Anal Chem*, 91 32 (1932)
- (4) Allport, *Quart J Pharm Pharmacol* 6 431 (1933)
- (5) Fleck and Ward *Ibid* 7, 177 (1934)

MEDICINE DROPPER TO DELIVER ONE MINIM (APOTHECARY'S MEASURE) PER DROP *

BY R A KONNERTH, R E SCHOETZOW AND F W NITARDY ¹

In prescribing potent galenicals such as Tincture of Digitalis, the physician frequently refers to drops when directing dosage. This practice subjects the dose actually administered to wide variations which depend upon the size and shape of countless varieties of droppers on the market

* Section on Practical Pharmacy and Dispensing, A. Ph. A. Portland meeting 1935

¹ Chemical and Pharmaceutical Laboratories E. R. Squibb & Sons Brooklyn New York

In designing a dropper which will deliver one minim per drop as nearly as possible, the factors which govern the formation and size of drops must be considered

The maximum volume of a drop of a given liquid which can form is dependent upon the surface tension of the liquid and its specific gravity. Such a maximum drop can form only when a flat surface of sufficient area is available.

The surface tension of hydro-alcoholic mixtures (as used in the preparation of Tincture of Digitalis) is such that at room temperature (25° C) the maximum drop is just less than one minim. A dropper, which will yield this maximum drop of such a hydro-alcoholic solution, has been designed. It consists of a straight glass tube 8 cm in length and having an internal diameter of 3.8 mm. One end is attached to a rubber bulb, while the other end is formed into a flange as shown in Fig 1.

Slight modification in the dimensions of the dropping flange will furnish a dropper suitable for minim per drop delivery of other liquids.

For Tincture of Digitalis the diameter of the dropping surface is 10.7 mm and the delivery end of the tube is constricted leaving an orifice of 3.8 mm to prevent leakage and increase accuracy. In order to obtain the maximum drop this dropper must be held in a vertical position and the drops expelled slowly from the full tube.

The accuracy of this dropper is shown by the following results obtained using Tincture of Digitalis at 25° C selected at random from stock

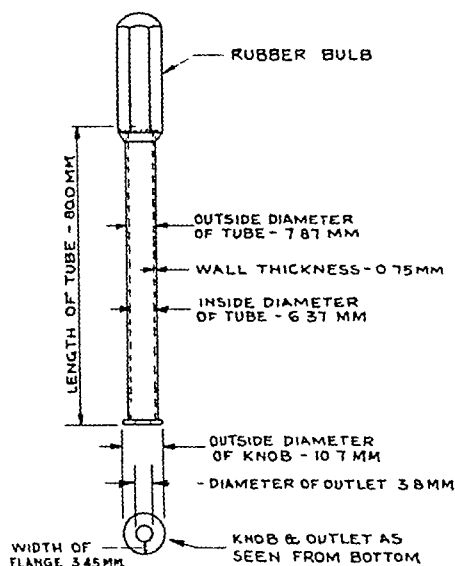


Fig 1

in thirty-five samples of the droppers

Minims per Drop	Number of Droppers Delivering This Amount
0.990-0.995	5
0.970-0.989	3
0.950-0.969	12
0.930-0.949	10
0.910-0.929	3
Less than 0.910	2

The largest volume delivered was 0.995 minims per drop, while the least was 0.901 minims per drop.

Prof. Harold Urey, discoverer of heavy water and Nobel Prize winner, has been awarded the Ernest Kempton Adams Research Fellowship in chemistry for 1935-1936. Columbia University announced October 10th. The announcement said Prof. Urey would be enabled to enter a new field of research.

A portrait of the late Prof. Charles F. Chandler—one of the founders of the American Chemical Society and member of the American Pharmaceutical Association from 1867 until his demise in 1925—was presented to Columbia University.

DAVID HENSHAW—FROM "DRUGGIST" TO SECRETARY OF THE NAVY *¹

BY GEORGE E. ÉWE

A record of the life activities of a man who started out as a "druggist" and later rose to the highest political office ever attained by an erstwhile member of the drug business, as far as known, should prove of interest to pharmacists in general and be worthy of retention in the archives of the profession

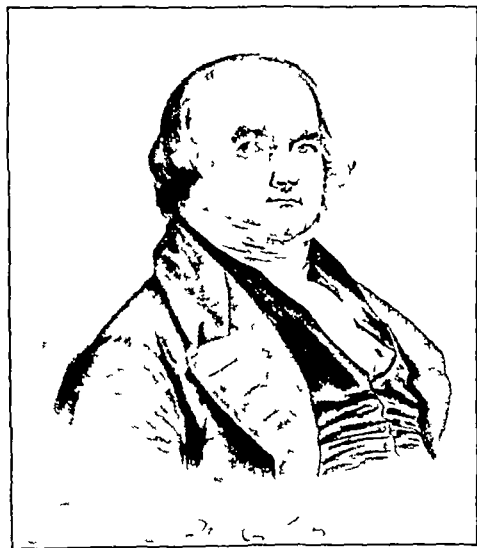
While David Henshaw is most generally put down as politician, promoter and author, his five years of apprenticeship followed by about thirteen years of joint proprietorship in the drug business, with which he started his business life, places him definitely as one of the drug calling

David Henshaw was a descendant of Joshua Henshaw of Lancashire, England, who settled in Dorchester, Mass., in about 1653

Henshaw's ancestors later moved to Leicester, Mass., and were among the original proprietors of the town. His father was a patriot of the Revolution and a highly respected magistrate

David Henshaw was born on April 2, 1795, in Leicester, Mass., the fifth son of David and Mary (Sargent) Henshaw. He was related to Artemus Ward, Commander-in-Chief of the Massachusetts forces during the Revolutionary War, who was in nominal command at the battle of Bunker Hill. Henshaw spent his boyhood days on his father's farm attending, during this time, the free schools and academy of his native town

At sixteen years of age he became druggist's apprentice with the firm of Dix and Brinley who carried on a "drug, paint and dye-stuffs" business



DAVID HENSHAW

located in the old Faneuil Hall Building in Boston, Mass

"On coming of age, although his employers were desirous of still retaining his services, yet they were unwilling to offer him more than $\frac{1}{8}$ of the business profits. They, as many Boston firms both before and since, made a mistake. The smart, enterprising and self-reliant young man thought he could do better, and he did. He determined to be his own master and without a dollar of capital set up for himself. Hiring, at a cheap rent, the store opposite the old State House in State Street (Boston), lately occupied as the office of the 'Boston Daily Advertiser,' he filled it up, but, with the exception of a barrel or two of ochre and possibly a few bottles, etc., he had no stock to put in. His old employer Mr. Brinley, often called as he was passing to his own store under Faneuil Hall, ostensibly to see how 'David' as he always called him, got along. His invariable salutation was 'Well, David, how's business?' David could not, with truth say it

* Section on Historical Pharmacy, Portland meeting, 1935

¹ Research Laboratories, Tailby-Nason Company, Boston, Mass

was good, as he had nothing to do business with, but the young man had not, in the meantime, been idle. He knew that most of their (his old firm's) goods came from the old house of David Taylor and Son, London. He had written them, stating all the circumstances of the case and at the same time enclosing a list of articles that he wanted, and promised, if they were sent to him, to remit the pay within a certain time. As there were no ocean steamers or telegraphic means of communication then, it took a long time for an answer, but it came at last in the shape of an ample stock for the long empty shelves. Old Mr. Brinley, during all this long time, had been constant in his calling on young David, possibly hoping that the valuable apprentice might be glad to go back to his old place again. But young David, though always honest, was sharp and far seeing—he had kept his business with Taylor and Sons to himself. Last of all he would have mentioned the matter to his old employer, who opened his eyes very wide with surprise one fine morning on beholding the almost magical change in David's amount and variety of stock."¹

Henshaw's business prospered mightily under his vigorous policies and seriously cut into the business of his former employers. In 1814, he allied himself with one David Rice, an expert paint man and glazier, as "Rice and Henshaw" and located in new quarters at 33 India Street (Boston). The business proved very successful and was further expanded. John Henshaw, a younger brother of David Henshaw, was admitted and the name of the firm was changed to "Rice, Henshaw and Co." Upon the retirement of Mr. Rice in 1825, Chas. Henshaw, an older brother, was admitted as partner and the firm's name was again changed—this time to "David and John Henshaw and Co."

Henshaw's firm also had a chemical works at South Boston and the following incident in connection with these works, taken from the aforesaid newspaper clipping seems worthy of recounting:

"The Messrs. Perkins receiving a large quantity of crude camphor which came on the deck of one of their ships from the East Indies, wanted Mr. Henshaw to buy it at 37¢ per lb. It came to \$45,000.00 quite a large amount of money for those days of comparatively small transactions. 'Mr. Perkins,' said Mr. Henshaw, 'we will take the camphor, if you can see your way clear to accept the note of our firm—we can give you nothing else.' Perfectly satisfactory," replied Mr. Perkins. This camphor was probably a safe purchase in any event, but it proved to be a very profitable investment. It was taken to their chemical works at South Boston, which, as they were largely engaged in the manufacture of spirits of turpentine, were, a part of them, burnt up on an average once a year and refined. Soon after the cholera first made its appearance in this country and the people having got it in their heads that camphor was a good thing to ward off its attack, their great stock of it was soon all gone at \$2.50 per pound."

But while the drug business was very profitable and successful it did not claim all of Henshaw's time and energies and he was interested in other ventures. He gave up the drug business in 1829 after about thirteen years of operation, presumably because of the pressure of his other activities.

Before he was 23 he had become a banker and had established an insurance company. By 1828 he had actively furthered a project for a railroad through the Berkshires to Albany, New York. Later, he became an incorporator of the "Western Railroad," which, with the "Boston and Worcester" of which he was also a director, completed the interstate line to Albany.

Henshaw possessed a keen knowledge of men and affairs, read much and was a vigorous author. He made frequent contributions to the *Boston Post* and other

¹ From a newspaper clipping of unknown date or origin kindly furnished by Miss Mabel W. Henshaw, Cambridge, Mass. Incidentally, this clipping affords many other anecdotes illustrating the humanness, liberality and sagacity of David Henshaw.

periodicals and wrote the important "Letters on the Internal Improvement and Commerce of the West "

In 1821, he and his associates established the *Boston Statesman* which opposed John Quincy Adams for president, but Henshaw later made terms with President Adams and gained election from Suffolk County to the Massachusetts State Senate in 1826 on President Adams' party ticket. Henshaw waged an active political life covering local, state and national affairs and became in turn Collector of the Port of Boston, Democratic "boss" of Massachusetts, State Legislator and Secretary of the Navy under President Tyler.

He was appointed Collector of the Port of Boston in 1829 by President Jackson and held this office for nine years to the acceptance of all who had occasion to do business with that department. He had great practical experience with high executive ability and brought these successfully to bear upon the orderly and systematic management of the affairs of this office.

His Navy Secretaryship dated from July 23, 1843 to Feb 19, 1844, when the Senate rejected his appointment in deference to Webster and other Whigs. But he had charge of it long enough to evince eminent talents and qualifications for the place. While Secretary he introduced a system of strict accountability for funds and materials of the department far beyond previous custom and also advocated the annexation of Texas as preliminary to the acquisition of California.

Henshaw's democracy was conservative. He was a capitalist, a Mason, an opponent of prohibition, a friend of slaveholders. A political rival characterized him as "a shrewd, selfish, strong-minded (but I believe corrupt-hearted) man" who directed his party "with a rod of iron" and would "see it damned ere others should."

Henshaw's will to rule was unmistakable, but there is little reason for questioning the sincerity of his convictions. "An ardent politician of the Jeffersonian school and true to its principles as the needle to the pole" (from inscription on Henshaw's tombstone). Incidentally, an inspection of this tombstone disclosed that it is inscribed with an extensive account of Henshaw's activities embracing a total of 232 words. He was a self-made man who achieved for himself wealth, political influence and power and an unquestioned reputation for mental vigor and energy of purpose, of no ordinary character. While the innate qualities of David Henshaw presaged success in the enterprises in which he engaged, one is disposed to feel that the studiousness, diplomacy, knowledge of people and organizing ability inculcated by his fairly extensive experience in the "drug" business materially aided in the attainment of this success.

Although he never married he dispensed a generous hospitality at his country home in Leicester, Mass. Henshaw died on Nov 11, 1852. Mr D H McKenna, Town Clerk of Leicester, Mass, states in a personal communication

"I am told his (Henshaw's) body is interred in 'Pine Grove Cemetery,' Pine Street, Leicester, in, presumably, the first cast iron casket in New England. About 1912 the old homestead (Henshaw's) was connected with our public water supply. In course of the work excavating for that purpose, several old cannon balls were unearthed. These relics are now in possession of William Montgomery who occupies the house at the present time."

In explanation of the finding of these cannon balls it may be of interest to note that in Henshaw's childhood a fort was situated directly opposite the Henshaw homestead and Henshaw, as a boy, was often lodged in the fort over night for pro

tection from marauding Indians. However, a pilgrimage to the Henshaw homestead disclosed that no relics of Henshaw are on deposit there, apparently the only relics extant being an oil painting and a tinted tintype of Henshaw in the possession of Miss Mabel W Henshaw, Cambridge, Mass. Incidentally, these are the only likenesses of David Henshaw encountered in this study.

Henshaw's homestead, now much reduced in spaciousness, by demolition of various sections, to suit the needs of the present day, is located in Henshaw Park, Leicester, Mass., and is the oldest house in the town.

Acknowledgment is due Miss Mary D Thurston, of Leicester, Mass., whose line of forebears was the same as that of David Henshaw, for contributions to the data embodied in this account.

The references listed herewith afford voluminous data which will be appreciated by the especially interested. Many anecdotes suitable for pharmaceutical eyes are also to be found among these references. But space-saving dictates the omission of these anecdotes, which are of the type utilized above in this account to illustrate the remarkable abilities and character of David Henshaw who made the "drug" business one of the stepping-stones to the high office of Secretary of the Navy.

REFERENCES.

- "Dictionary of American Biography" (Scribner's, 1932, Vol 8)
- "History of Leicester (Mass.)," Washburn
- "Reminiscences of Leicester," Joseph Addison Denny in *Worcester Daily Spy*, 1873-1875
- "Dictionary of U S History," Jameson
- "Harper's Encyclopedia of U S History," Vol 4, Lossing
- "Dictionary of American Biography," Drake
- "Dictionary of Biographical Reference," Phillips
- Private memo book of Mrs Mary E Thurston, Leicester, Mass
- "The National Cyclopaedia of American Biography," J T White & Co
- "The 20th Century Biographical Dictionary of Notable Americans," Johnson & Brown
- "American Biographical Dictionary," Allen
- Private Henshawiana Collection of Miss Mabel W Henshaw, Cambridge, Mass

HOW TO HELP THE PHARMACIST COMMERCIALY *

BY E C BROKMEYER

It is so self-evident that the pharmacist must be qualified professionally to succeed that further comment as to this is unnecessary.

If the American people appreciated and supported professional pharmacy to the same extent that the English people do, there would be no place on the program of this convention for the presentation of a paper on the subject of "How to Help the Pharmacist Commercially." Whether wisely or not, the American people have seen fit to develop the American drug store along commercial rather than professional lines. It is true that here and there pharmacists have scored distinct successes in the conduct of strictly professional or ethical pharmacies, but unfortunately they are the exceptions rather than the rule.

When the writer of this paper discusses "How to Help the Pharmacist Commercially" it must not be understood that he in the least fails to appraise professional pharmacy at its true and proper value—the highest. The profession of pharmacy

* Section on Education and Legislation, A Ph A, Portland meeting, 1935

is and must continue to be equal in importance with all other professions, including medicine and law. Its relationship and responsibility to the public are equally important and serious. The only justification for a paper on "How to Help the Pharmacist Commercially" is the fact that as conditions confront the American druggist to day his problem is to become solvent in thousands of cases and to remain so. This is no less a serious problem for the American people, but unfortunately they either do not know it or, if they do, they are in the main indifferent.

The pharmacist may be helped commercially in a number of ways. Under the National Industrial Recovery Act, NRA encouraged the adoption of scientific cost accounting methods where not used and where impossible. Unfortunately the average pharmacist does not have the necessary capital to enjoy the benefit of such methods by engaging qualified accountants, but nevertheless he may call in a qualified accountant and have him place his books and accounts and system of conducting his business in proper order and from time to time check up his store. A pharmacist at all times should know accurately his cost of doing business, including every factor that enters into its determination, in order to ascertain the price at which he must sell his merchandise and his service so as to net him a reasonable profit on his investment, including his professional training.

A pharmacist may be helped commercially by emulating as far as possible the example of the modern enterprising and progressive chain and department stores. Although the limited capital of the average pharmacist is a serious handicap, the fact remains that he can improve the appearance of his store and his display windows and make more of an appeal to the public. He will lose nothing by going out of his way to be accommodating and see that his clerks are. He must inspire confidence in his patrons. He must note fast- and slow-moving merchandise and govern himself accordingly in handling it. He should cultivate his patrons as much as possible, both in person and occasionally by mail, if not by local advertising, including the radio. The pharmacist should above all things exercise extraordinary care in compounding physicians' prescriptions and take pains to see that his registered clerk does. There should be no shortage or excess in the quantities of the ingredients prescribed. A preparation compounded upon a physician's prescription should be neither adulterated nor misbranded under the law. The pharmacist will help himself commercially by exercising extraordinary care in compounding prescriptions and getting the benefit of a reputation for doing this.

A pharmacist can help himself commercially and his fellow pharmacists by resorting to fair trade practices at all times and under all conditions, however trying. The National Industrial Recovery Act failed of successful administration because of the lack of full and proper cooperation on the part of many units in the industries and professions in observing the rules adopted by them and approved by NRA.

Finally, the pharmacist may be helped commercially by legislation and honest and efficient administration of the laws needed for his protection against unfair competition. To obtain these needed laws and proper enforcement pharmacists must be organized into forceful and intelligently directed city, state and national associations. This is not enough—pharmacists must sell their profession and their business to the public. Until they do they cannot reasonably expect the laws needed to protect them against unfair competition, which in most cases means destructive competition.

THE PHARMACIST STUDIES LAW *

BY CHARLES G. AJAX

As students, we learned that pharmacy is an ever-unfolding science, that we can conceive of no cessation in the study of the laws of nature. And that necessity captured our imagination. We looked forward to practicing our profession, at the same time, as initiates into the mysteries of nature, we understood that there could be no formula in a compromise with truth.

It soon became evident that in the economy of pharmacy other laws were involved which, in accordance with social phenomena, are likewise in a continuous state of evolution—a biological interpretation of law, as it were. These are trade regulations which, in accord with the common practice of the biological science, reach a balance or equilibrium at times in the whim of the consumer—and man is satisfied—for the time being. It is thus apparent that these laws are in constant flux. While the law of supply and demand remains unalterable, its varying manifestations bring new problems to us daily in the interest of *fair play*.

And now, if we are to keep up with the procession, another type of law must be studied. We must understand so-called Constitutional Law. The American system of law-making is a thing, fearfully and wonderfully built. From the village constable up to the nation's President, from Congress at Washington down to the Council of Podunk, each unit of legislative or judicial authority is hedged with perplexing limitations. Our government has been called a system of checks and balances. Our bewildered brains whisper, "Ah, yes, plenty of checks—a check on every forward-looking effort. But nothing is balanced."

When a mariner is adrift in a stormy night his fears are calmed by study of the charts, which his good judgment planned during fair weather. May I question if, in the darkness and stress of to-day, we have a compass and chart for guidance? Let us look at fundamental law and ascertain.

The most basic factor to comprehend is that the constitutionality of law is not a subject for exact laboratory technique. It has less exactness than our laboratory sciences, for it is purely a human means—so liable to fallibility since social values are personal. Were each of us in this room handed a specimen of an unknown substance to determine whether it was acid, alkali or neutral, an identical laboratory report would be obtained from all. Not so with jurisprudence, whether it be a law of Congress, or of city council. A body of attorneys, handed a new mandate for legal analysis, might submit multitudinous interpretations. But the large majority will respond in a manner well calculated to preserve dignity in the final verdict of the Supreme Court. Regardless of that decision, most of these will have been so ambiguously phrased that each may proudly announce, "I told you so!"

I have no quarrel with juridical science, since our very system of government makes this state of affairs inevitable. Nevertheless, when we pharmacists see lawyers and judges forever in disagreement, when we perceive respected experts on either side of every question, *failing to take cognizance of social justice*, may we not feel justified in analyzing for ourselves in the molding force of legal progress?

The question has more than academic interest. It is not my purpose to amuse you with aimless reflections on our system of law-making. There are certain defi-

* Section on Commercial Interests, A. Ph. A., Portland meeting, 1935

is
me
im
Pl
di
so
th

N
ac
av
me
fic
in
pl
ev
wl
pr

ex
A
fa
de
of
fic
ge
as
in
ca
te
in
sh
he
se

re
Th
th
ar

ar
cc
m
as
bi
no
de

... order to be ... our common ...
... living ...
... opportunity ...
... in the ...
... I have ...
... during ...
... limited ...
... all the ...
... all ...
... other state ...
... of the ...
... been ...
... permitting ...
... over it ...
... By ...
... have ...
... to ...
... all ...
... at ...
... the Police ...
... what right ...
... our ...
... over our ...
... explosives ...
... I ...
... when ...
... right to ...
... adm ...
... and ...
... the ...
... rest upon ...
... regulations, later codified ...
... and the development ...
... and amusement ...
... in the ...
... we wish ...
... law were a joke, twenty years ago no law limited ...
... many trade practices were ...
... of us agree that ...
We smile ...
free ...
could

prevents fire, pestilence, insurrection, the sale of impure foods and obscene literature, is the same power of the people which now undertakes to safeguard *the owner* of a twenty-million dollar trade-mark, as well as the little merchant who sells a tube of toothpaste so costly trade-marked

It cannot be over-emphasized that Fair Trade laws aim to serve the small shopkeeper with his small stock, just as much as they are intended to *protect owners* of million dollar trade-marks. And conversely, Fair Trade laws will protect the consumer, not merely indirectly by enabling the independent merchant to remain solvent and to maintain his position as a sustaining citizen, but by eliminating a multitude of fraudulent practices which follow "loss leader" advertising. These abuses are too well known among ourselves to require discussion, but the public's education on this subject has never received deserved attention.

Do you not get the right prospective?—A nation of almost 130,000,000 people, including a conservative estimate of 120,000,000 fair-minded citizens—Forget for the moment the 10,000,000, and bear in mind that there are 120,000,000 of us, *little folks*. We are The People. Aren't we, The People, entitled to determine under which laws we'll live? Now you and I have *the requisite power*. *Let's use it*. If we do not, I foresee cataclysmic upheavals because of our very stupidity.

When the glib salesman of an unfair manufacturer or a sleek competitor gabs about constitutional law and talks of Fair Trade laws as the bunk, don't discuss the matter. You need not get on the defensive. Simply state "I'm sorry, Mister, but I've studied law myself, and I'm too busy to argue with anyone who hasn't."

The Greeks had a word for it, and let me refresh your memory—no people better understood the value of local rule in relation to law, for which they had profound respect. Government was The People. In fact, Athens was termed a "City State." Can you not hear the echoes of the cheering audience as the Athenian in the play rebukes a stranger with these words:

"It is a city and *free*
The *whole folk* year by year, in parity of service
is *our King*

DEVELOPMENT OF PHARMACY IN WEST CHINA

BY E N MEUSER *

"Four Thousand Years of Pharmacy" gives an exceedingly interesting account of the ancient history of Egyptian and Babylonian pharmacy. Comparatively little mention is made, however, of the pharmacy of ancient China. The author states "We know less about the pharmacy of ancient China than we do of that of either the Egyptians or Babylonians. This is probably because the Chinese have always been uncommunicative and secretive to an unusual degree, and because there has been less research into the ancient literature of the living nations than into the literature of races that have disappeared." This is, unfortunately, only too true, and the fact constitutes a challenge, or opportunity for those with the time and inclination in this direction, to delve into what the writer considers an

* Chengtu, W. China, Feb 16, 1935

nite principles which we must remember in order to better our condition by means of new legislation or by application of existing laws. Otherwise, our efforts may be wasted, for time spent in chasing rainbows is opportunity lost.

All power to make regulations for government lies in the people themselves, except such rights as the people have yielded in reconciliation of conflict. Much power has been delegated, yet far more has been retained than generally believed. The use of extraordinary powers by Congress during war time has led us to forget that Congress, after all, is a body of definitely limited authority. *Congress has only such power as the people have given it.* All the rest of the original power—call it what you will, natural, or divine—still resides in the people. This control the people have entrusted to the legislatures of their states, and within certain clearly defined limitations, the legislature is the voice of the people. Congress is not.

Too long has the national constitution been regarded as a God-given Mosaic law. It can serve the individual only by permitting *free* research in our local legislative laboratories. Only in this way can we realize that this country belongs to the living, that the dead have no power over it. By respecting the will of the state our national constitution will have fuller moral force and support.

Of what practical use to the pharmacist is this fundamental principle? Simply this: let us not, in our zeal for national legislation to correct existing evils, overlook the fact that the legislature of each state has at hand numerous methods for every one available to Congress. Consider the Police Power of the State. Every moment we feel its direct impact. By what right does the state tell us how poisons may be dispensed, where to park our automobiles, when to segregate infectious diseases, plus the many minor restrictions over our own home property—accumulation of refuse or prohibition of holiday explosives. All of these regulations certainly conflict with what a rugged individualist might consider inalienable rights. Yet even such an individualist, when his home is burning, heartily approves of the right of way to fire-engines. Again, the right to free speech is curbed. By what title are you restrained from spreading rumors concerning the status of a bank or a trust company? On inquiry we find that man may not talk as he pleases—that certain expressions of individualistic thought are antagonistic to social welfare—hence illegal. These legal norms rest upon the will of the people, an outgrowth of custom, expressed first in police regulations, later codified in state legislation.

With increased population and the development of modern machinery and newer methods of distribution and amusement, heretofore unheard-of dangers arise, and the people retain the right of pronouncement with respect to these hazards. For example, do we wish speed or safety in travel?

A generation ago speed laws were a joke, twenty-five years ago flying licenses were not required, twenty years ago no law-limited radio programs, ten years ago, despite the fact that many trade practices were in disrepute, no law prohibited their use. At present 99 per cent of us agree that such laws are essential. Five years ago, a Fair Trade law was a theory. We smiled and said, "Oh, yes, some day, mayhap, but not yet, lest we interfere with free exchange of goods." And yet to day, approximately one-half of the population of these United States is under a Fair Trade law. Nine states have tardily enacted a *modern type of statute*. Ten legislatures, within two years, have clearly seen that the legal force which protects the health of their children and the stability of our great financial institutions, which

prevents fire, pestilence, insurrection, the sale of impure foods and obscene literature, is the same power of the people which now undertakes to safeguard *the owner* of a twenty-million dollar trade-mark, as well as the little merchant who sells a tube of toothpaste so costly trade-marked

It cannot be over-emphasized that Fair Trade laws aim to serve the small shopkeeper with his small stock, just as much as they are intended to *protect owners* of million dollar trade-marks. And conversely, Fair Trade laws will protect the consumer, not merely indirectly by enabling the independent merchant to remain solvent and to maintain his position as a sustaining citizen, but by eliminating a multitude of fraudulent practices which follow "loss leader" advertising. These abuses are too well known among ourselves to require discussion, but the public's education on this subject has never received deserved attention.

Do you not get the right prospective?—A nation of almost 130,000,000 people, including a conservative estimate of 120,000,000 fair-minded citizens—Forget for the moment the 10,000,000, and bear in mind that there are 120,000,000 of us, *little folks*. We are The People. Aren't we, The People, entitled to determine under which laws we'll live? Now you and I have *the requisite power*. *Let's use it*. If we do not, I foresee cataclysmic upheavals because of our very stupidity.

When the glib salesman of an unfair manufacturer or a sleek competitor gabs about constitutional law and talks of Fair Trade laws as the bunk, don't discuss the matter. You need not get on the defensive. Simply state: "I'm sorry, Mister, but I've studied law myself, and I'm too busy to argue with anyone who hasn't."

The Greeks had a word for it, and let me refresh your memory—no people better understood the value of local rule in relation to law, for which they had profound respect. Government was The People. In fact, Athens was termed a "City State." Can you not hear the echoes of the cheering audience as the Athenian in the play rebukes a stranger with these words:

"It is a city and *free*
The *whole folk* year by year, in parity of service
is *our King*

DEVELOPMENT OF PHARMACY IN WEST CHINA

BY E. N. MEUSER *

"Four Thousand Years of Pharmacy" gives an exceedingly interesting account of the ancient history of Egyptian and Babylonian pharmacy. Comparatively little mention is made, however, of the pharmacy of ancient China. The author states: "We know less about the pharmacy of ancient China than we do of that of either the Egyptians or Babylonians. This is probably because the Chinese have always been uncommunicative and secretive to an unusual degree, and because there has been less research into the ancient literature of the living nations than into the literature of races that have disappeared." This is, unfortunately, only too true, and the fact constitutes a challenge, or opportunity for those with the time and inclination in this direction, to delve into what the writer considers an

* Chengtu, W. China, Feb 16, 1935

exceedingly fascinating study of Chinese pharmaceutical lore reaching back into forgotten ages. The written history resulting from such a study would be a very valuable contribution indeed. The ancient type of Chinese medicine shop conducted by a combined pharmacist-physician continued fairly general until the arrival in China of the medical missionary and the representatives of Western pharmaceutical manufacturing houses. With the introduction of Western medicines there has been a gradual transformation of the old-time, small, floorless drug shop with its miscellaneous assortment of crude native drugs of animal and vegetable origin cluttering the walls, ceiling and counter, to the modern type of drug store—larger, cleaner, bright and airy, and with a great variety of drugs, chemicals,



The first class of pharmacists to graduate from any University in China—June 1934 of the Department of Pharmacy of the West China Union University Chengtu, W China

Second row Dr Beech Chancellor of University, Dr Djang President of University, Miss Foster, Dean of Woman of University, Dr Meuser Head Department of Pharmacy of University, Mr Chang Dean of Science of University

surgical supplies, chemical apparatus and patent medicines on display, and with quite up-to-date drug store fixtures and furnishings

Unfortunately, in most cases these drug stores are in charge of people who have not had pharmaceutical or medical training, and there is, therefore, the promiscuous buying and selling of Chinese and foreign drugs, potent, poisonous and otherwise. This obviously constitutes a real danger to public health. The Chinese Government Ministry of Health, realizing this danger, has prepared considerable legislation governing the practice of pharmacy in China. It provides for the sale of medicines and the dispensing of prescriptions by pharmacists only who have the necessary qualifications. It also endeavors to provide for efficient dispensing of medicines in hospitals by stipulating that there shall be qualified pharmacists on the staff of all hospitals.

Because of the great amount of medicine required in so vast a population as that of China, and the fact that China produces such a tremendous variety and abundance of crude drugs, the task of research in these crude drugs and the subsequent manufacture into modern medicines calls for the services of many trained pharmacists

Obviously, without schools of pharmacy in which to train these pharmacists, neither this important work of research and manufacture nor the enforcement of the laws of the Central Government, as just mentioned, can be carried out for the time being. However, in order to try to meet these needs a few schools of pharmacy have been opened in different parts of China during the past three years. Not the least important among these schools recently opened is the Department of Pharmacy in the West China Union University, Chengtu, W. China. In this Department a course of four years of instruction is given leading to the degree of Bachelor of Science in Pharmacy (B. S. in P.).

When the Department of Pharmacy of the W. C. U. U. was opened in the Fall of 1932, there was an enrollment of sixteen students in the first year. In addition to these, there were four other splendid students who had already completed two years of studies in Science and who transferred from other departments and registered in the third year of pharmacy. In June 1934, therefore, these four students, having finished their studies, had the unique distinction of being the first class of pharmacists to graduate from any University in China. This is but the beginning of other and larger classes to follow. These graduates are now doing splendid work in their respective positions.

In 1934 the Central Government of China, at Nanking, showed its general interest in the development of pharmacy in China, and its special interest in and recognition of the Department of Pharmacy of the West China Union University by making a grant of five thousand dollars (\$5000.00 Chinese) toward the purchase of equipment for the department. This, naturally, was highly appreciated, as it enabled us to secure some of the apparatus most urgently needed.

Then, also, the department was the recipient of a further gift of what is expected to be an annual sum of money from a well-known firm of pharmaceutical chemists in Germany toward equipment and salary of an assistant teacher. This, too, was much needed and was gratefully received.

While these grants have given pharmacy in West China a good start, further financial cooperation will be constantly needed for maintenance.

As an industrial profession, modern, scientific pharmacy has a real, vital, missionary service to render to China. In its various phases of work, such as research in crude drugs, manufacture of medicines, hospital dispensing and private practice, it offers in a very practical way a workable solution for some of China's economic problems by giving pleasant and remunerative employment to those engaged in the profession, while at the same time rendering a materially helpful service to the public.

The future prospects for the Department of Pharmacy of the West China Union University are quite encouraging, and those of us engaged in this work count it a privilege to have a share in this phase of God's great work in China. We shall be glad to hear at any time from friends interested in our work here.

THE DEPARTMENT OF THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY

C B JORDAN—CHAIRMAN OF EXECUTIVE COMMITTEE, A A C P, EDITOR OF THIS
DEPARTMENT

Your Editor is pleased to offer to the College Section the following paper by Professor Walter Crosby Eells, a well known and authoritative writer on the center of population of various phases of education. All of us expected the center of population of pharmaceutical education to move westward as more colleges of pharmacy were established west of the Alleghenies, but I doubt that any of us expected the sharp reversal as indicated in the past decade.

In Professor Eells' contribution there is food for thought for every executive and teacher of Pharmacy—C B JORDAN, *Editor*

THE CENTER OF POPULATION OF PHARMACEUTICAL EDUCATION, 1870-1930

BY WALTER CROSBY EELLS *

The *center of population* is defined by the United States Census Bureau as "the point upon which the United States would balance, if it were a rigid plane without weight and the population distributed thereon, each individual being assumed to have equal weight and to exert an influence on the central point proportional to his distance from the point." In other words it is the center of gravity of the weighted plane or a two-dimensional average of the population.

The determination of this point at the regular decennial census intervals is the best method that has been devised by the Census Bureau to trace compactly the rate and direction of general movements of the population. The first official computation of this point was made under the direction of Francis A. Walker, superintendent of the ninth census, for publication in the first statistical atlas of the United States published in 1874.¹ At that time the position of the center of population was computed for each census year since 1790.

So convinced has the Census Bureau become of the value of this mode of summarizing population trends that in later years it has made much more extensive use of the same method. In 1910 the positions of the center of population since 1880 for each state were computed. In 1920 the method was further extended to include centers of foreign-born population, of Negro population, of urban and rural population, and even to determine centers of agriculture, of manufacturing, of number of farms, of farm area, of improved acreage, of value of farm property, and of the production of corn, wheat, cotton and oats.²

* Professor of Education Stanford University

¹ Walker, Francis A. (Compiler) 'Statistical Atlas of the United States Based on the Results of the Ninth Census.' Washington, 1874, page 5. For an earlier unofficial computation and other information regarding history of the center of population see Eells, Walter Crosby, "The Center of Population—a Prophecy and Its Fulfilment," in *The Scientific Monthly* 20 78-84, January 1925.

² Sloane Charles S. (Compiler), 'Center of Population and Median Lines and Centers of Area, Agriculture, Manufactures and Cotton' (Fourteenth Census of the United States, 1920) Washington, 1923, pages 12-41.

Why not then educational centers of population as well? A method which has proved so valuable in summarizing movements of general population should be equally valuable in studying the movements of the higher educational population—the student enrollment in the colleges, universities and professional schools of the United States ¹ The object of this paper is to report and discuss the results of computations which have been made by the author to determine the *center of population of pharmaceutical education* for each census year from 1870 to 1930

METHOD OF COMPUTATION

The data upon which the computations are based were taken from the official reports of the United States Office (formerly Bureau) of Education ² These statistics are not perfect, but they probably are as accurate and reliable as are available The method used was the same as that of the Census Bureau, with the substitution of "states" (with their centers of population as computed by the Census Bureau) for "square degrees" as the unit of computation ³ The number of students of pharmacy involved for each census year is as follows

1870	440
1880	1,347
1890	2,871
1900	4 042
1910	6 226
1920	5,026
1930	10,906

It is noteworthy, although not directly pertinent to this study to observe that the reported number of students of pharmacy more than doubled between 1920 and 1930

LOCATION OF CENTERS

The latitude and longitude and approximate location of the center of pharmaceutical education for the seven different decennial years, 1870–1930, are shown in Table I and on the map of Fig 1 The map also shows the location of the general

¹ For two such studies, see Walter Crosby Eells, "The Center of Population of Higher Education" *School and Society* 24, 339–344 (September 11, 1926), and "The Center of Population of Engineering Education 1900–1930," *Journal of Engineering Education*, 25, 662–669 (June 1935)

² Reports of the Commissioner of Education 1870, page 524, 1880, page 154, 1889–1890, page 1023, 1899–1900, 2, page 1973, 1910, 2, page 1034 Biennial Survey of Education, 1918–1920 (*Bulletin*, 1923, No 29), page 294, Biennial Survey of Education, 1928–1930 (*Bulletin*, 1931, No 20), pages 349–350

³ "In making the computations for the location of the center of population it is necessary to assume that the center is at a certain point Through this point a parallel and a meridian are drawn, crossing the entire country The product of the population of a given area by its distance from the assumed parallel is called a north or south moment and the product of the population of the area by its distance from the assumed meridian is called an east or west moment In calculating north and south moments the distances are measured in minutes of arc, in calculating east and west moments it is necessary to use miles on account of the unequal length of the degrees and minutes in different latitudes The population of the country is grouped by square degrees—that is by areas included between consecutive parallels and meridians—as they are convenient units with which to work"—SLOANE, CHARLES S, *loc cit*, page 5

center of population of the country for the same dates. The abbreviation "C S" in Table I indicates that the town named is the county seat of the county in which the given center is located.

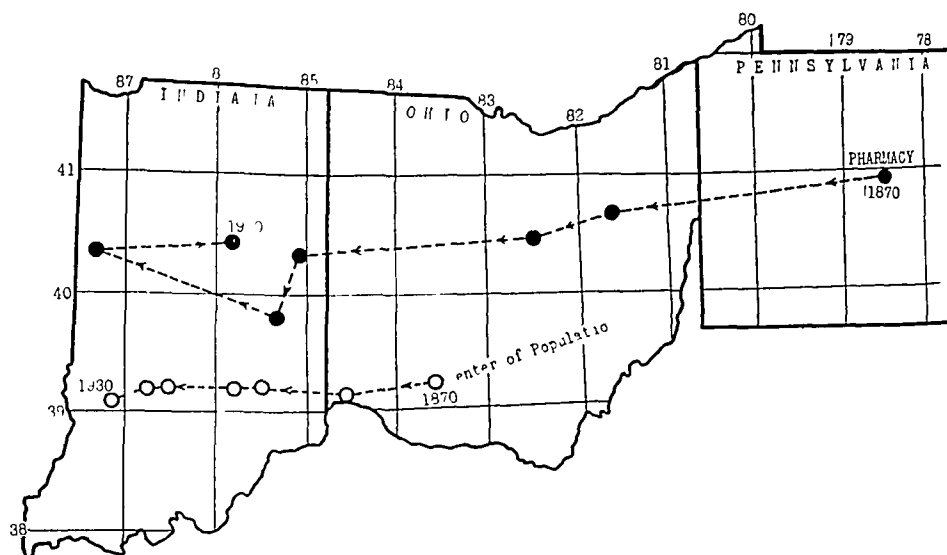


Fig 1—Movement of centers of population of pharmaceutical education and of the general population, 1870-1930

TABLE I—LOCATION OF CENTERS OF POPULATION OF PHARMACEUTICAL EDUCATION, 1870-1930

Year	Latitude North	Longitude West	State	County	Distance from Important Cities and Towns
1870	40° 56'	78° 33'	Penna	Clearfield	84 miles N E of Pittsburgh 8 miles S W of Clearfield, C S
1880	40 39	81 39	Ohio	Holmes	31 miles S of Akron 15 miles N E of Millersburg C S
1890	40 24	82 30	Ohio	Knox	39 miles N E of Columbus 1 mile N W of Mt Vernon, C S
1900	40 21	85 02	Indiana	Jay	22 miles N E of Muncie 6 miles S W of Portland, C S
1910	39 50	85 20	Indiana	Henry	23 miles S of Muncie 7 miles S E of Newcastle, C S
1920	40 21	87 20	Indiana	Warren	58 miles N of Terre Haute 4 miles N W of Williamsport C S
1930	40 25	85 49	Indiana	Grant	48 miles N E of Indianapolis 12 miles S W of Marion, C S

The most outstanding fact shown is the rapid shift westward during the half century from 1870 to 1920 of the center of population of pharmaceutical education—a total of 463 miles in only fifty years. This movement carried it from a point in Western Pennsylvania across Ohio and Indiana almost to the Illinois line. It is surprising to note, however, the sharp reversal of a half century's trend in its sudden movement eastward from 1920 to 1930 of 80 miles back into the eastern part of Indiana. The trend has been steadily southward for the first forty years, but in the past two decades it has shifted northward again although still more than 30 miles south of its 1870 position. The movement of the center of population for education in pharmacy, in miles for each decade, is summarized in Table II.

TABLE II —MOVEMENT OF CENTER OF POPULATION OF PHARMACEUTICAL EDUCATION, 1870-1930
(In Miles during the Preceding Decade)

Year	From Point to Point in a Straight Line	Northward	Southward	Eastward	Westward
1880	162 9		16 7		162 0
1890	47 1		14 7		44 8
1900	133 5		3 2		133 5
1910	35 0		31 2		15 9
1920	110 6	31 2			106 1
1930	80 0	3 9		79 9	
Totals (net)			30 7		382 4

Reference to the map of Fig. 1, shows that the center of population of pharmaceutical education has always been north and with one exception (1920) has also always been east of the center of general population for corresponding years. While the center of general population has moved westward only 190 miles in six decades, the center of pharmaceutical education shifted westward 462 miles in the first five decades. Even if the 80-mile eastward shift of the last decade be taken into account, the 1930 position is more than twice as far from its 1870 position as was the case for the general population. Westward the Course of Empire has taken its way, but far more rapidly for students of pharmacy than for the general population. The north and south distance between the two centers, which was 120 miles in 1870, had decreased to 93 miles in 1930. Relative to the distribution of the general population, there always has been a much greater emphasis on education in pharmacy in the North than in the South, and except in 1920 in the East than in the West. Viewed as a whole, however, the East has lost much of its earlier primacy in the field of pharmaceutical education.

What the situation will be in 1940 is problematical. The general center of population will doubtless be at or near the Indiana-Illinois line. Whether the pharmaceutical center will continue eastward, or will reverse itself again and continue its general westward trend is an open question. It seems doubtful, however, whether it will move entirely out of Indiana by 1940.

Such facts as are presented in this paper, summarizing long time trends, may furnish food for thought and speculation on the part of those responsible for the education of the pharmacists of the future.

MEDICAL MILE-STONES

"The Medicine Man of the American Indian and His Cultural Background" is the rather lengthy but arresting title of a recent study by Dr. William Thomas Corlett, professor emeritus after long service on the Faculty of Medicine of Western Reserve University. The Indian tribes included in the study inhabit or have inhabited the lands from the Arctic Circle

to Terra del Fuego and from the Atlantic to the Pacific Oceans. Although some of the information in the volume has been acquired by the author through first-hand contacts, much of it is the result of careful study and research into records, histories and other documents. A valuable bibliography covers eighteen pages and includes publications in six languages dated from 1510 to 1934.—From *Medical Milestones*, September 4th

THE DEPARTMENT OF THE NATIONAL ASSOCIATION OF BOARDS OF PHARMACY

H C CHRISTENSEN SECRETARY 130 NO WELLS ST CHICAGO, ILL

SYNOPSIS OF PROCEEDINGS OF THE THIRTY-SECOND ANNUAL CONVENTION OF THE NATIONAL ASSOCIATION BOARDS OF PHARMACY HELD IN PORTLAND, OREGON, AUGUST 5-6, 1935

The thirty second annual meeting of the National Association of Boards of Pharmacy made an exceptionally good attendance record for the first meeting to be held in the Pacific Northwest—32 states were represented by 59 delegates, with 7 honorary members (former board members) in attendance

President Charles Hall Evans (Georgia) appointed the following Credentials Committee E E Magee (Oregon) *Chairman*, A L I Winne (Virginia), John K Clemmer (Florida)

The following delegates responded to Roll Call

Alabama L C Lewis	Nevada R W Fleming, E B Loring, H M Skeels
Colorado, Arthur D Baker, Wm J Bishop	New Hampshire, P J Callaghan, George A Moulton
Connecticut, Edward J Murphy, Hugh P Bierne, George Blackall, Charles Gustafson, Wm J Dunphy	New Jersey, R P Fischelis
District of Columbia, C J Fuhrmann or Samuel L Hilton (provis)	New York, F C A Schaefer, Hugo Schaefer
Florida, W M Hankins, John K Clemmer	North Dakota, P H Costello, E P Martin
Georgia, Charles Hall Evans	Ohio, M N Ford, F H King
Idaho F L Christenson	Oklahoma W D Patterson, Ned Milligan
Indiana Edgar A O'Harrow	Oregon E E Magee John F Allen, M E McKee M C Kaegi, Frank C Berg, Linn E Jones
Iowa, George W Gillman, George Judisch	Pennsylvania L L Walton
Kansas, Joe Paradowsky, Mac Childs, Frank Milne, Pat Mulligan, Walter Varnum	Puerto Rico H C Christensen (provy)
Kentucky, J W Gayle	South Dakota, H J Schnaidt, E C Severin
Maine, Leon H Marr, Adolphe L Rivard	Tennessee Geo W Lamar
Maryland, Robert L Swain	Texas Roy Phillips
Minnesota Wm C Muesing, Edw J Prochaska	Virginia A L I Winne
Massachusetts Timothy S Shea	Washington, Peter H Brady
	West Virginia Roy B Cook
	Wyoming R C Shultz

One hundred per cent attendance from Connecticut Kansas, Oregon

Honorary Members Albert Zimmerman, F Mortenson, Chas J Clayton, W P Porter field, Chas H Avery, John Culley, C T Gilbert

John Culley introduced Secretary W M Fulton of the California Board of Pharmacy

Vice-President Shultz assumed the Chair during the reading of the Presidential Address

(See page 673, August JOURNAL, A PH A)

The following Committee on President's Address was appointed by Vice President Shultz R W Fleming (Nevada) *Chairman*, A D Baker (Colorado) Ned Milligan (Oklahoma)

SECRETARY'S REPORT

Secretary Christensen reported a cash balance in his accounts of \$2815 27 as of June 30, 1935, also the issuance of 613 reciprocal applications during the fiscal year The report included a review of the work of the central office in the legislative and examination fields, a study of repeat failures in board examinations, a description of the new administrative set up in Rhode Island, a complete report of the Nebraska situation where all reciprocity had been temporarily suspended on order of the N A B P Executive Committee early in June, a suggested plan under which

experience *since* registration can be counted when the applicant is short *prior* time, the details of the plan being submitted in resolution form and were referred to the Resolutions Committee

Treasurer J W Gayle reported funds totaling \$5389 86 in his accounts

EXECUTIVE COMMITTEE REPORT

Chairman A L I Wiene read the report The mid year meeting had again been omitted on account of the expense

The report included a statement of income and expense from May 1, 1934 to June 30, 1935 (fourteen months), showing a cash increase of \$2339 58, with total cash assets of \$8205 13 as of July 1, 1935 The budget report showed that only \$13,848 14 had been spent of the \$14,400 00 appropriated—a saving of \$551 86

The question of date of removal of the offices of the Association to the American Institute of Pharmacy in Washington was considered and a motion adopted that the date be left entirely to the discretion of Secretary H C Christensen Certain financing is necessary to cover the cost of removal, refurnishing of the new offices, etc , also Secretary Christensen is needed in Chicago to superintend the installation of the Pharmacy Exhibit of the World's Fair in the Rosenwald Museum of Science and Industry in Chicago as a part of the new Department of Medical Science which is being planned, therefore a definite date could not be set at this time

The Executive Committee approved the resumption of reciprocal relations with Nebraska on the basis outlined in a letter received from Dr P H Bartholomew, Acting Director of the Nebraska Department of Health, which provides that the N A B P preliminary blank is to be mailed out by his Department on all inquiries with a special letter (as per copy submitted by him) explaining the Nebraska situation under the present law, with the understanding that the Nebraska law is to be amended at the next legislative session so that the usual N A B P procedure can be legally carried out

A budget totaling \$15,250 00 was adopted by the Executive Committee for the ensuing fiscal year 1935-1936

COMMITTEE REPORTS

The *Advisory Examination Committee* report dealt primarily with statistics that had been collected by the Chairman H C Christensen, on the repeat failure problem His conclusion, based on this information was that the problem was not serious enough in pharmacy, on account of the high entrance requirements for the board examinations, to warrant limiting the number of permissible failures to three

Mac Childs (Kansas) presented a *Legislative Committee* report that covered 47 states—a record in completeness He expressed himself as being personally opposed to the principle of limiting the sale of barbituric acid derivatives and other hypnotics to physicians' prescriptions, a type of restriction now gaining popularity He deemed registration of the sale by the pharmacist, with a precaution against misuse, a sufficient public safeguard

R L Swain (Maryland) delivered a most comprehensive report on the *National Legislative* situation covering in detail the Copeland bill S 5 to amend the Federal Food and Drugs act, a proposed act regulating the practice of pharmacy in the District of Columbia, and several bills with regard to the Medical Department of the U S Army which are of interest to pharmacy A recommendation approving S 5 was included in the report, which was referred to the Resolutions Committee

Chairman W M Hankins (Florida) of the *Grievance Committee* re iterated the report of previous years—no grievances reported

Secretary H C Christensen in his report as chairman of the *National Certificate Committee* briefly reviewed previous attempts to establish a national certificate and then outlined a plan for future consideration by the boards which he believed workable Details will be published in the proceedings

Roy Bird Cook (West Virginia) as Chairman of the *Committee on Pharmaceutical Jurisprudence* had contacted all the boards on the subject of making this a written and compulsory examination subject The answers revealed that few boards were now giving this as a written subject, that others preferred to keep it as part of the oral quiz, and that many were not in favor of making it compulsory R P Fischelis (New Jersey) a member of the committee, did not agree

with the conclusions of the committee so his separate statement was read The report of the committee was accepted, however, and the committee continued

R L Swain (Maryland) reported for the *Committee on Code Matters*, which had had little opportunity to function on account of the unconstitutionality of NRA In view of the fact that a skeleton organization of NRA is being retained, he recommended that the committee be continued in case something should come up later that requires action

Unfortunately A C Taylor (District of Columbia) chairman of the *Committee on Minimum Standards of Technical Equipment for Pharmacies* was not present at the meeting He sent in a detailed report, however, covering the two years of activity of the Committee The report concluded with a recommendation that the N A B P endorse the establishment of such standards and urge member boards to adopt them The recommendation was referred to the Resolutions Committee

As Chairman R W Fleming of the *Committee on President's Address* had been called home from the meeting by wire Arthur D Baker (Colorado) delivered the report, highly complimenting the president on his splendid address

DISTRICT REPORTS

Very interesting reports on the work of the various districts were delivered by Vice-President George Moulton (No 1), Acting Chairman Mac Childs (No 6), and Vice-President Shultz of District No 7 reported that a conference of the Western boards would be held on Wednesday morning after the close of the N A B P sessions at Portland In the absence of Vice President Woodside R L Swain reviewed the work of District No 2

R L Swain as Director of the Department of Education urged continuation of the Department, although no funds were available during the year just completed for that work

L C Lewis (Alabama) delivered a very moving tribute to the memory of Dr W E Bingham, much loved secretary of the Alabama Board and the first honorary president of the N A B P who had passed on to his reward during the year

RESOLUTIONS COMMITTEE

As none of the standing members of the Resolutions Committee were present at the meeting and only two members of the Committee on Constitution and By-Laws President Evans combined these committees and asked L C Lewis, R W Fleming and R L Swain to serve

The report of the Committee, with the exception of one resolution which was deleted, was accepted The following are the adopted resolutions

No 277 *Resolved*, that in the interest of bringing about closer cooperation between states, every board of pharmacy should be represented at the annual N A B P convention Where the state treasury allows no such budget, the state pharmaceutical association should make some provision for sending a board delegate to represent the interests of the pharmacists of that state Where neither the state treasury nor the pharmaceutical association can assume this expense, some consideration should be given to the willingness of board members personally to make such a sacrifice when the appointment lists are made up but not overlooking the fact that fitness as an examiner should be the first consideration

No 278 *Resolved* by the National Association of Boards of Pharmacy that the Federal Food and Drugs Act is not sufficiently broad to afford the public the necessary protection in the matter of foods, drugs, and cosmetics, and that there exist pressing reasons for new legislation on this subject,

Resolved further, that it is the opinion of the N A B P that the present draft of Senate Bill No 5 meets the existing situation in a reasonably satisfactory manner and the passage of the bill is urged at this session of Congress

No 279 *Resolved*, That all member boards be urged to send copies of all bills introduced in the respective state legislatures which affect pharmacy either favorably or unfavorably to the central office of the N A B P so that they may be studied as well as being made available to the boards of all states

Be it further resolved, that all legislation sponsored by boards be submitted for suggestion and criticism so that state legislation bearing upon pharmacy may be made as uniform as possible

No 280 *Resolved* by the National Association Boards of Pharmacy that in the interest

of public health, all pharmacies be required to possess the equipment and apparatus necessary to proper compounding of physicians' prescriptions as well as the general practice of pharmacy and that each member board be urged to secure legislation authorizing it to prescribe the minimum for such technical equipment and

Resolved further, that a Committee be continued in the N A B P to advance the purposes of this resolution and to act as advisors in the matter to the various state boards

No 281 Recognizing the necessity for a full understanding of the conditions under which pharmacy is practiced in the various states as furnishing the soundest basis for pharmaceutical legislation as well as giving the strongest support to a program for pharmaceutical betterment, *resolved*, that the National Association Boards of Pharmacy sponsor a study of economic and professional conditions in each state, the study to consist of a questionnaire to be prepared by the central office and to be issued in each state by the respective board of pharmacy for the purpose of establishing reliable data upon the following (1) the number of drug stores in the state, (2) population of the state, (3) ratio of drug stores to population, (4) volume of drug business, (5) amount of prescription work, (6) the number of new drug stores opened within the year, (7) the number of registered pharmacists, (8) the number of unregistered employees, (9) the number of students of pharmacy in state, (10) ratio of students to the number of existing stores, (11) a statement of those registered by examination over a ten-year period so that trend in registration may become known, (12) defects in existing pharmacy laws and suggestion for their improvement, (13) and all such other data as may be considered helpful,

Resolved further, that the scope of this study may be extended or restricted as the judgment of the President and the Secretary of the N A B P may dictate,

Resolved further, that the president is authorized to appoint a special committee to carry out this study if he deems it desirable

The report of the Standing Committee on Resolutions, which had been prepared in advance covering the district resolutions, was then read and received on motion No action was taken on the individual resolutions therein contained, as none of the committee members were present and few of the district chairmen to lead in the discussion of the matters presented

PRESENTATION OF PLAQUES

Chairman J A J Funk (Indiana) of the Committee on Plaques was not present at the meeting therefore the presentation was made by Mac Childs of Kansas, who originally made the suggestion that the N A B P present a scroll or plaque to each of the four officers of the Committee on Pharmacy Exhibit (Chicago World's Fair, 1933-1934) to show its appreciation of the work done by these men in bringing the message of pharmacy to the public so effectively

The recipients were H C Christensen *Chairman*, Julius H Riemenschneider, *Treasurer*, Frank B Kirby, *Secretary*, and Dr A S Burdick, *Vice President* (deceased), presentation to be made to the widow

AMENDMENT OF THE CONSTITUTION AND BY-LAWS

As required a suggested amendment to the Constitution and the By-Laws was read at the first session by Chairman L C Lewis, which was later changed in wording by motion at the final session and adopted as follows

ARTICLE IV, CONSTITUTION

Section 1A The officers of the Association shall be an *Honorary President*, a *President*, eight *Vice-Presidents*, a *Secretary* and a *Treasurer*, elected annually and who shall hold office until their successors shall be elected and shall have qualified

ARTICLE II, BY-LAWS

Clause (e) He must have passed an examination in at least Pharmacy, Chemistry, Materia Medica, Pharmaceutical and Chemical Mathematics and Practical Work, obtaining not less than 75% on Practical Work and not less than 75% general average with not less than 60% in any one branch (Effective June 1936, as previously adopted)

ELECTION

A L I Winne (Virginia) reported for the Credentials Committee that the roll and the credentials had been examined and found in satisfactory order

The Nominating Committee, which consisted of George A Moulton (N H) *Chairman*, Walter Varnum (Kan), Linn E Jones (Ore) R C Shultz (Wyo), and W M Hankins (Fla) delivered the following report for consideration *Honorary President*, F H King, Delphos, Ohio *President*, Mac Childs, Eldorado, Kan , *Secretary*, H C Christensen, Chicago, Ill , *Treasurer* J W Gayle Frankfort Ky , *Member Executive Committee* Chas Hall Evans, Warrenton, Ga , *Member Syllabus Committee*, Walter H Cousins, Dallas, Tex , *Member Resolutions Committee* Arthur D Baker, Denver, Colo *Vice Presidents* District No 1, George A Moulton, Peterboro, N H , No 2, John M Woodside, Philadelphia, Pa , No 3, John K Clemmer, Miami Fla , No 4, Earl Durham, Corunna, Mich No 5, Wm Muesing, New Ulm, Minn , No 6 E E Weaver Ft Worth, Tex No 7 R C Shultz, Worland Wyo , No 8 John F Allen, Corvallis Ore These officers were duly elected by the unanimous ballot of the Association cast by George Judisch (Ia) who had been particularly selected for the honor, inasmuch as the secretary was a candidate himself

After installation of officers the meeting adjourned (Report of Joint Session with Colleges will be published in annual proceedings, details not yet available)

ASSOCIATION BUSINESS

AD INTERIM BUSINESS OF THE COUNCIL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, 1935-1936

Office of the Secretary 2215 Constitution Ave Washington, D C

LETTER NO 3

September 21 1935

To the Members of the Council

20 *Resignation of E Fullerton Cook as a Nominee for the Presidency* In addition to the letter addressed to the Secretary on September 14th by Dr Fischelis copies of which were sent to members of the Council, a letter has been received from Dr Arny of which copy is attached (To members of the Council)

There is also attached copy of a letter addressed to Dr Fischelis on September 18th, submitting information about the action taken with respect to previous requests from nominees (To members of the Council)

Because of the necessity for an early decision if the ballots are to be sent out within the time required by the By Laws, the secretary discussed the situation with Professor Cook over the telephone on September 20th and Professor Cook repeated the request that the resignation be accepted for the reasons given in his letter

The chairman of the Council requests that the announcement be made that a vote will be called for on Motion No 1 on Saturday, September 28, 1935

21 *Sale and Exchange of Liberty Bonds* Motion No 2 (Council Letter No 2 page 804) has been carried and the Liberty Bonds referred to have been deposited for exchange at par for Treasury Bonds, 2 $\frac{1}{4}$ %, 1945-1947 dated September 15, 1935

Dr Fischelis commented as follows in voting Yes as a temporary expedient, effort should be made to find more remunerative investments as soon as possible '

22 *Minutes of the First Meeting of the Council* Copies of the minutes of the First and Second meetings of the Council at Portland are being sent under separate cover

(Motion No 3) It is moved by Eberle that the minutes as given in Council Letter No 1 be approved

23 *Report of Committee on Resolutions* A reprint of this report as it appears in the August issue of the JOURNAL, is being sent under separate cover for the convenience of the members of the Council

Attention is directed to those recommendations and resolutions which were referred to the Council for consideration or action These will be referred to in later Council Letters

24 *Applicants for Membership* The following applications properly endorsed and accompanied by the first year's dues have been received

No 1, Everett Carl Crist, Mission City, B C, Canada, No 2, Justus C Ward, 526 Customs House, Denver, Colo, No 3, Arthur H Neumann, 4821 W North Ave, Milwaukee, Wis, No 4, E O Klein, Farmington, Missouri, No 5, Hamilton Cameron, 5406 Connecticut Ave, Washington, D C, No 6, C R Brogan, 600 W Pico, Los Angeles, Calif, No 7, Geo A Moulton, Peterborough, N H, No 8, Ferdinand Benjamin Zienty, 4861 Cornelius Ave, Chicago, Ill, No 9, August Ulrich, 4715 McCasland Ave, East St Louis, Ill, No 10, Mariko Nishio, Box 667, Milwaukee, Oregon, No 11, Joseph H Ammirai, 6295 Third St, San Francisco, Calif, No 12, Edgar P Martin, Hazen, N Dak, No 13, Paul Reznick, 1228 Eye St, Washington, D C, No 14 Aaron Engel, 19 Cumming St, New York, N Y, No 15, Stanley G Halley, Star Lake Ave, Bloomingdale, N J

(Motion No 4) *Vote on applications for membership in the American Pharmaceutical Association*

E F KELLY, *Secretary*

LETTER NO 4

September 28 1935

To the Members of the Council

25 *Resignation of E Fullerton Cook as a Nominee for the Presidency* In accordance with the notice given in Council Letter No 3, preceding letter, a vote is called for on Motion No 1, Council Letter No 2, page 804 No additional comments have been received since the issuance of Council Letter No 3

26 *Minutes of the First Meeting of the Council* Motion No 3 (Council Letter No 3, page 876) has been carried and the minutes are approved as published

27 *Election of Members* Motion No 4 (Council Letter No 3, page 876,) has been carried and applicants numbered 1 to 15, inclusive, are declared elected

28 *Applicants for Membership* The following applications properly endorsed and accompanied by the first year's dues have been received

No 16, Carroll Cornwall, 1927 Jackson St, San Francisco, Calif, No 17, Everett S Ostrum, 1432 Fifth Ave, San Francisco, Calif, No 18, Herbert H Gerding, 3414 Fairfield Ave, Ft Wayne, Ind, No 19, Max L Miller, 415 W Durham Rd, Philadelphia, Pa, No 20, Fred E Lehman, 6758 Paschall Ave, Philadelphia Pa

(Motion No 5) *Vote on applications for membership in the American Pharmaceutical Association*

E F KELLY, *Secretary*

LETTER NO 5

October 5, 1935

To the Members of the Council

29 *Resignation of E Fullerton Cook as a Nominee for the Presidency* Sixteen of the eighteen members of the Council have returned voting cards on Motion No 1 (Council Letters Nos 2 page 804, 3 page 876, and 4, page 877) Eleven voted "yes," three voted "no" and two did not vote The motion has therefore, been carried and the resignation is accepted

The following notation will appear on the ballot as was done previously in similar cases "Note by the secretary—Professor E Fullerton Cook of Philadelphia, Pa, was nominated for president but his name was withdrawn at his request and by permission of the Council"

The ballots will be dated October 15, 1936

30 *Election of Members* Motion No 5 (Council Letter No 4, preceding letter) has been carried and applicants numbered 16 to 20, inclusive are declared elected

31 *Appointment of Committees, etc* President Costello has made the following appointments (see A PH A JOURNAL, August 1935, page 707)

Committee on Pharmacy Corps in U S Army—F L McCartney, Chicago, Ill, is added to membership *Committee to Draft Model Act Restricting Distribution of Drugs and Medicines to Pharmacists*—F E Mortenson, Los Angeles, Calif is added to membership *Committee on Development of Pharmacy Laws*—R L Swann, Chairman, Baltimore, Md, R P Fischelis Trenton,

N J , Geo W Mather, Albany, N Y , H C Christensen, Chicago, Ill , Rowland Jones Jr , Washington, D C , M W Fulton, San Francisco, Calif , P H Dirstine, Pullman, Wash *Committee on Transportation* —R A Kuever, Iowa City, Iowa, replaces H C Newton *Councilors to American Association for the Advancement of Science* —John C Krantz, Jr , Baltimore, Md , and A F Schlichting, Ferguson, Mo *Committee on Endowment Fund* —Dr J H Beal has requested to be relieved as a member and as Chairman of the Committee Dr Wm B Day is designated as *Chairman* and Dr F J Wulling Minneapolis, Minn , as a member of the Committee *Committee to Study Constitution and By Laws* —R L Swain, *Chairman*, Baltimore, Md , W B Day, Chicago, Ill , J H Beal, Fort Walton, Fla , R P Fischelis, Trenton, N J , E F Kelly, Washington, D C *Committee to Study Courses in the History of Pharmacy* —C O Lee, *Chairman*, La Fayette, Ind , E J Ireland, Madison, Wis , Lloyd E Harris, Norman, Okla *National Committee on Professional Information Pertaining to Dental Pharmacy* —George C Schicks, *Chairman*, Newark, N J , A O Mickelsen Portland Oreg , R W Clark Madison Wis , A R Bliss, Birmingham Ala , R E Terry, Chicago, Ill
E F KELLY, *Secretary*

UNITED STATES PHARMACOPŒIA

ABSTRACT OF PROPOSED CHANGES WITH NEW STANDARDS AND DESCRIPTIONS

ELEVENTH REVISION

Copyright 1935 by the Board of Trustees of the United States Pharmacopœial Convention *
All Rights Reserved

PART V—BOTANY AND PHARMACOGNOSY

The Pharmacopœial Convention of 1930 recommended that 'abstracts of changes proposed for the U S P XI and new standards and descriptions' be published before final adoption, that those who are not members of the Revision Committee may have an opportunity for comment and criticism

In compliance with this recommendation the following abstracts are submitted The nomenclature and the exact wording does not necessarily represent that to be finally adopted

Changes in assays and strengths will be found in Part II, on Proximate Assays

Comments should be sent to the chairman of the Revision Committee

E FULLERTON COOK,
43rd and Woodland Avenue,
Philadelphia, Pa

Acacia —The standard for purity has been changed by the addition of an ash requirement—'not more than 4 per cent of total ash and not more than 0.5 per cent of acid insoluble ash'

Under "*Powdered Acacia*" the sentence on solubility has been altered—'at room temperature' being inserted after 'cold water' and 'resulting' inserted before "solution"

In the "*Test for identity*," the nature of the precipitate has been changed from 'gelatinous' to 'flocculent or curdy, whitish' A polariscopic test has been added, viz, "A 10 per cent aqueous solution of *Acacia*, when examined by the polariscope, shows but slight laevorotation"

Under the *Tests for purity* the starch and dextrin tests have been amplified by specifying the strength of the *acacia* solution and requiring it to be boiled and cooled before the addition of iodine T S

A test for the water insoluble residue has been added

Aconitum —The description has been broadened so as to include subspecies and varieties of *Aconitum Napellus*

Agar —('Fam *Florideæ*') has been added after "*Gelidium*" in the definition

The moisture content in the purity rubric has been increased to 18 per cent

The description has been altered to specify Japanese *Agar* as the kind containing frustules of *Arachnoidiscus Ehrenbergii*

* Permission to reprint for purposes of comment can be had on application to the Chairman of the Board of Trustees, James H Beal Fort Walton, Fla

Tests for identity A solubility and jelly test have been made a part of the "Tests for identity" "The color of the fragments treated with iodine T S" has been amplified to read "with some areas reddish or violet"

A new picric acid test for gelatin has been added

Aloe—Cape Aloe has been dropped from this monograph

Althæa—There is an added requirement that *Althæa* contain "not more than 1 per cent of foreign matter" Under 'Unground *Althæa*' the old statement "due to mucilage cells" has been changed to read "with mucilage cells"

Amylum—Under "Description and physical properties," "lenticular" has been changed to read 'circular'

Aspidium—The phraseology under *structure* has been somewhat altered, including the change from 'glandular hairs' to 'oleoresin glands,' from "bundles bicollateral" to 'bundles xylocentric,' from 'tracheæ' to "tracheids"

Belladonna Folium—The titles of the drug have been changed from the plural to the singular number throughout

Changes under 'structure' including the following "usually with 3 neighboring cells" changed to read "with 3 or 4 neighboring cells," 'crystal cells large, filled with microcrystalline calcium oxalate' changed to read, "cells filled with microcrystals numerous," "Stem with long, thin walled, slightly lignified bast" changed to read "Stem, with long, thin walled, slightly lignified pericyclic fibers, bicollateral fibrovascular bundles, parenchyma interspersed with crystal cells, etc"

Powdered Belladonna Leaves Description slightly changed by introducing 'ellipsoidal' before "bordered pores" and deleting the terms 'bast' and 'wood' before fibers

Under the "*Tests for purity*" the test has been broadened to read "Rosette aggregates and raphides of calcium oxalate are absent in *Belladonna Leaf*, when present, adulteration is indicated"

Belladonna Radix—Under "*Powdered Belladonna Root*" the "bast fibers" have been changed to 'pericyclic fibers'

Benzoinum—The definition has been changed to specify '*Styrax tonkinensis* (Pierre) Craib ex Hartwich' as one of the sources of Siam Benzoin

The character of the odor of Unground Sumatra Benzoin is changed to read 'the odor suggests cinnamates or storax'

In the potassium permanganate test, "strong odor of benzaldehyde" replaces 'odor of benzaldehyde' The benzoic acid test has been altered in part to read "the residue is not less than 12.5 per cent"

Cannabis—The description of the structure of the stem and of the powdered drug have been made clearer by elaboration The term 'cystolith' replaces "calcium carbonate" in the description of the non glandular hairs

Cantharis—The description of the insect has been elaborated by changing 'legs with 5 tarsal joints' to 'the first and second pairs of legs with five tarsal joints, the hind pair with four tarsal joints, all with two distal claws' The description of the antennæ has been amplified also

Under Powdered *Cantharides* the dimensions of the spicules is changed to read "0.020 mm in width at the base"

Cardamomi Semen—External color of unground drug changed from 'reddish gray-brown' to "pale orange to dark brown" The words 'and slightly bitter' were added to the description of the character of the taste

The description of the structure of the seed is amplified to include the loosely attached membranous arillus and the more detailed description of the stone cells whose lumina contain silica

The powdered drug description is slightly amplified by clarifying the last clause relating to few pericarp fragments as allowable admixture

Carum—Caraway Fruit has been added as an additional synonym The description of the unground drug has been slightly altered by including a clause concerning the secondary ribs which occur between the primary ribs on the dorsal surface The description of the powdered drug has been slightly amplified to include the presence of few fragments of slightly lignified fibers

Caryophyllus—Unground Clove The description has been somewhat altered to conform

with the accepted modern interpretation relative to the stemlike portion of the clove bud which is now called the receptacle and which contains the inferior ovary

Cascara Sagrada—A requirement has been included that it contain not more than four per cent of foreign organic matter *Unground Cascara Sagrada* The color of the outer surface has been amplified to include purplish brown "

Structure The description of the cork has been changed to read Cork yellowish brown, purple or reddish brown, up to 10 or more rows of small cells " Bast fibers in small bundles surrounded by crystal fibers" has been changed to read bast fibers in small bundles, more or less surrounded by crystal fibers "

Tests for identity The wording of both tests has been slightly altered the colors resulting being respectively described as occurring in or of the mixture

Celaceum—*Definition* 'A fatty substance' has been changed to read 'A waxy substance'

Description The wording of the sentence dealing with solubility has been made more definite

Cinchona—The *definition* is changed to include both stem and root barks of Red and Yellow Cinchonas

The *description* is changed so as to include diagnostic features of root bark as well as stem bark

Cinnamomum—The purity standard is extended to permit not more than 2 per cent of foreign organic matter

Structure The description has been slightly altered, particularly in reference to the region of the pericycle where the term pericyclic fibers has replaced bast fibers "

Powdered Cinnamon Bast fibers" has been changed to 'fibers' and the waxy character of these is indicated, 'fragments of somewhat lignified cork' has been added

Digitalis—*Standards of potency* This has been changed The potency of Digitalis shall be such that 0.1 Gm. shall be equal to not less than 1 U S P digitalis unit It contains not more than 2 per cent of brown leaves stems flowers or foreign organic matter, not more than 8 per cent of moisture and yields not more than 5 per cent of acid insoluble ash Under all conditions of storage and transportation the drug should be kept in water proof and air tight containers A note has been introduced making it mandatory to dispense *Digitalis Pulverata*, when Digitalis is prescribed

Powdered Digitalis This subcaption has been changed to "Ground Digitalis" The description of the ground drug has been slightly changed The terminal cell of the uniseriate, non-glandular hairs is indicated as being pointed or occasionally rounded

Digitalis Pulverata A new article has been introduced, viz a standardized powdered digitalis

Definition Digitalis dried at a temperature not exceeding 60° C and reduced to a fine powder The strength of this article is to be such that 0.1 Gm. shall be equal to not less than 1 and not more than 1.1 U S P digitalis units Powdered Digitalis of a higher potency is to be reduced to the official standard by admixture with the exhausted marc remaining when preparations of Digitalis have been prepared the marc being dried and finely powdered before mixing It contains not more than 5 per cent of moisture

Description Same as for Ground Digitalis

Storage Preserve Digitalis in water proof and air-tight containers

Ergot—*Purity standard* The standard of assay has been changed to read, 'Ergot when assayed by the method directed below, possesses a potency, per gram, equivalent to not less than 0.5 mg. of ergotamine ethanesulfonate' An 8 per cent moisture limit has been introduced

Description and physical properties Under 'Unground Ergot' the thickness has been changed to read 'up to 5 mm. thick' External features altered by addition of 'occasionally transversely fissured' and color changed to 'externally nearly black or purplish brown—internally white sometimes tinged with pink or gray'

Structure The description has been slightly amplified by adding "hyphal" before cells

Storage A paragraph has been introduced requiring Ergot to be kept in water proof and air-tight containers under all conditions of storage and transportation

Powdered Ergot The word 'hyphal' has been inserted before "cells"

Erodactylon *Definition* The author citation has been changed by dropping "Bentham"

Description Under "*Unground Eriodictyon*," the color of the upper surface has been amplified to read "yellowish to greenish brown." The character of the lower surface is changed to read "greenish to yellowish gray with greenish yellow or brown veins." The taste is changed to read "taste balsamic, bitter, becoming sweetish and slightly acid."

Under "*Structure*," "*Loose mesophyll*" has been changed to "*spongy parenchyma*." The character of the hairs occurring on the lower surface has been amplified.

Galla — *Definition* Changed to read "Nutgall is the excrescence obtained from the young twigs of *Quercus infectoria* Olivier and other allied species of *Quercus* (Fam. *Fagaceae*)."

Tests for identity have been added.

Gentiana — The purity requirements have been extended to include not more than 10 per cent of moisture, and not more than 2 per cent of foreign organic matter.

The description has been slightly altered to indicate the longitudinal wrinkling of the rhizomes and the twisted character of some segments of the rhizome and roots. The external color has been changed from yellowish brown to "generally dark brown occasionally light brown." The internal color has been changed to yellowish to orange brown.

The description of the powdered drug has been amplified to include fragments of cork and hypodermal cells.

A microsublimation test has been added.

Glycyrrhiza — The description of the internal structure has been partially rewritten and made more complete. Under Powdered *Glycyrrhiza* the width of the tracheæ is cited as "up to 0.200 mm in diameter." A new method has been introduced in the test for fatty matter.

Hioscyamus — Under "*Structure*" calcium ovalate has been deleted following "microcrystals." Under powdered *Hioscyamus*, the description of the heads of the glandular hairs is changed to "multicellular."

Ipecacuanha — The Nicaraguan or reddish brown variety of Cartagena Ipecac has been added and changes made in the definition and description so as to include this commercial variety of the drug. The external color description of Cartagena Ipecac has been changed to grayish, grayish brown or reddish brown.

Kino — The rubric paragraph has been changed to read "Kino yields not less than 60 per cent of alcohol soluble extractive." The Bickford-Bennett method is used in assaying this drug.

Limonis Cortex — The botanical variety name in the definition has been changed from *Limonum* (Risso) Hooker filius to "*Limon* Linné." The description has been amplified by adding "membrane crystals" as occurring in some of the parenchyma cells.

Myrrha — The following tests for purity have been added: "Myrrh becomes purplish to violet when treated with nitric acid." "An ethereal solution becomes violet red when treated with bromine vapors."

The Bickford-Bennett method is indicated for alcohol soluble extractive.

Nux Vomica — Under description the thickness has been changed to from 3 to 5 mm.

Podophyllum — The purity requirement has been changed to specify not less than 3.5 per cent of the resin of podophyllum, and a limit of 3 per cent of foreign organic matter has been added.

The description of the unground drug has been partly rewritten and amplified, the internal characteristics being changed to read, "the bark yellowish to grayish, the wood showing a circle of small yellowish xylem bundles, the pith large and grayish."

Under the structure of the rhizome, the outer portion is found to consist of "one to four layers" of suberized cells.

Under Powdered *Podophyllum* tracheæ "mostly" has been inserted before "with simple pored, etc.," and "cork" has been changed to "suberized."

Prunus Virginiana — In the description of the unground drug the outer surface of both young and older unroasted bark is described, the grayish black color of older bark being added. The structure paragraph has been completely rewritten. Under Powdered Wild Cherry, the color is changed to "light brown to reddish brown." "Calcium ovalate prisms or rosette aggregates numerous" is changed to read "calcium ovalate chiefly in monoclinic prisms but also in rosette aggregates."

The drug is directed to be protected from moisture as well as from light.

Pulvis Glycyrrhizæ Compositus —The description has been augmented by adding "washed sulfur fragments" to the other microscopical elements

Rheum —In the structure portion of the description "vascular bundles with internal sieve and cambium" is changed to compound vascular bundles in the rhizome portions with internal sieve and cambium "

The test for the presence of rhapontic rhubarb has been deleted

Santalum Rubrum —The taste now reads "slightly astringent "

Sarsaparilla —The rubric paragraph has been altered so as to make it mandatory to remove the rhizome and crown portion if in excess of 4 per cent, before the root is ground or powdered

The histological portion of the monograph has been slightly altered by inserting "fibre " before vascular bundles adding pericambium" as a part of the central cylinder and by changing "groups" to strands '

Scilla —The description of the powdered drug has been amplified by adding "fragments of red pink or purple epidermal or parenchyma bulb scale tissue absent (*Red Squill*) "

Senna —The limit on Senna stems is reduced to eight per cent

The paragraph on structure has been amplified to include the histology of the midrib region

Serpentaria —The description of the internal appearance of the unground drug has been changed to read 'internally bark brown, wood yellow and composed of broad eccentric wedges, pith whitish "

Sinapis Nigra —Under Powdered Black Mustard a portion of its seed coat is permitted to be removed to facilitate the powdering

Sramonium —In the description of the powdered drug, "rod like crystals" is changed to "prisms" and 'sphenoidal microcrystals of calcium oxalate is omitted

Tragacantha —The test for foreign gums has been deleted

Valeriana —Under the description of the structure of the root portion, the thickened radial walls of the endodermal cells and the radial fibre vascular bundle have been introduced

Veratrum Viride —The description of the histology of the root has been amplified to include the large, irregular cavities in the outer region of the cortex

Zingiber —Jamaica Ginger is now the only variety recognized

UNITED STATES PHARMACOPŒIA

ABSTRACT OF PROPOSED CHANGES WITH NEW STANDARDS AND DESCRIPTIONS

ELEVENTH REVISION

Copyright 1935 by the Board of Trustees of the United States Pharmacopœial Convention *
All Rights Reserved

PART VI—ORGANIC CHEMICALS

The Pharmacopœial Convention of 1930 recommended that "abstracts of changes proposed for the U S P XI and new standards and descriptions" be published before final adoption that those who are not members of the Revision Committee may have an opportunity for comment and criticism

In compliance with this recommendation the following abstracts are submitted The nomenclature and the exact wording does not necessarily represent that to be finally adopted and doses have not been appended

Comments should be sent to the Chairman of the Revision Committee

E FULLERTON COOK, *Chairman*,
43rd and Woodland Avenue,
Philadelphia, Pa

Acidum Aceticum Dilutum —Contains in each 100 cc not less than 5.7 Gm and not more than 6.3 Gm of $\text{HC}_2\text{H}_3\text{O}_2$ The acid is prepared by mixing 158 cc of Acetic Acid with enough distilled water to make 1000 cc, a change from a gravimetric to a volumetric formula

* Permission to reprint for purposes of comment can be had on application to the Chairman of the Board of Trustees James H. Beal Fort Walton Fla

Acidum Acetylsalicylicum—The melting point is not below 135° C when determined by placing the sample in a bath at 130° C and heating at a rate of 3° per minute

The test for carbonizable substances is standardized in terms of color See JOUR A PH A, 22, 956-961 (1933)

Acidum Citricum—In the colorimetric test for lead, the volume of lead nitrate solution used for comparison is reduced to 2 cc, a reduction of 50 per cent in lead tolerance

Acidum Oleicum—Congealing temperature, not above 10° C Acid value, 188 to 200 Iodine value 85 to 95 The cloud test has been omitted

Acidum Salicylicum—Dissolve 1 Gm in 30 cc of hot distilled water, cool in ice and filter 15 cc of filtrate shows no turbidity (*sulfate*) upon the addition of 2 drops of hydrochloric acid and 5 drops of barium chloride T S

The test for carbonizable substances is standardized as to color

Acidum Stearicum—Defined as a mixture of solid acids obtained from fats, consisting chiefly of palmitic and stearic acids

Congealing temperature, not below 54° C Iodine value, not more than 4 A powdered form of the acid is also recognized

Acidum Tartaricum—In the colorimetric test for lead, the volume of lead nitrate solution used for comparison is reduced to 2 cc, a reduction of 50 per cent in lead tolerance

Acritflavina—A new admission A copy of the monograph may be obtained from the Chairman of the Committee of Revision

Acritflavinæ Hydrochloridum—A new admission A copy of the monograph may be obtained from the Chairman of the Committee of Revision

Adeps—Solidification point of the fatty acids, 36° to 42° C

Adeps Lanæ—The free acids in 10 Gm require not more than 1 cc of tenth normal sodium hydroxide for neutralization

Iodine value, not less than 18 and not more than 36

Æther—This title is reserved for anesthetic ether

A new test for aldehydes is introduced Place 20 cc of Ether in a colorless, glass stoppered cylinder and add 7 cc of a mixture of 1 cc of alkaline mercuric potassium iodide T S with 17 cc of a saturated aqueous solution of sodium chloride Stopper the cylinder and shake it vigorously for ten seconds, then set it aside for one minute the aqueous layer shows no turbidity (*aldehydes and ketones*)

A 1 in 10 solution of potassium iodide replaces cadmium and potassium iodide as the reagent for peroxides

Æthylenum—A new admission A copy of the monograph may be obtained from the Chairman of the Committee of Revision

Æthylhydrocupreina Hydrochloridum—A new admission A copy of the monograph may be obtained from the Chairman of the Committee of Revision

Æthylis Oxidum—This is the title for the newly introduced Solvent Ether It is to be used for all purposes except anesthesia

The test for peroxides is identical with that under *Æther*, with the exception that only one minute is allowed for the reaction

The test for aldehydes is identical with that under *Æther* in U S P X

In all other respects Ethyl Oxide must satisfy the requirements under *Æther*

Alcohol—The litmus paper test has been replaced by a direct titration for acidity 50 cc of alcohol diluted with 50 cc of recently boiled distilled water shall require not more than 0.9 cc of fiftieth normal sodium hydroxide for neutralization, using phenolphthalein as indicator

A new test for *organic impurities aldehydes, etc.*, replaces the silver nitrate test Place 20 cc of Alcohol in a glass stoppered cylinder that has been thoroughly cleaned with hydrochloric acid, then rinsed with distilled water and finally with the Alcohol to be tested Cool the contents to approximately 15° C and add by means of a carefully cleaned pipette, 0.1 cc of tenth-normal potassium permanganate noting the exact time of addition Mix at once by inverting the stoppered cylinder and allow it to stand at 15° C for five minutes the pink color must not entirely disappear

The test for *acetone* is replaced by the following To a mixture of 1 cc each of Alcohol and distilled water add 3 cc of distilled water and 10 cc of mercuric sulfate T S and heat on a bath of

boiling water no precipitate forms within three minutes (*acetone, ketones, isopropyl alcohol and tertiary butyl alcohol*)

The details of the test for *methanol* have been modified to some extent

Aminopyrina (Amidopyrina U S P X)—To 0.1 Gm of Aminopyrine add 0.1 Gm of vanillin, 5 cc of distilled water and 2 cc of sulfuric acid and heat the mixture to boiling it develops no more color than is obtained by adding 5 cc of distilled water and 2 cc of sulfuric acid to 0.1 Gm of vanillin and heating the mixture to boiling (*antipyrene*)

Amylis Nitris—*Assay* Place about 20 cc of aldehyde free alcohol in a 100 cc glass stoppered volumetric flask and weigh accurately. From a pipette add from 3 to 4 cc of Amyl Nitrite, stopper the flask, again weigh accurately and calculate the weight of the Nitrite taken for assay. Add enough aldehyde-free alcohol to make a volume of 100 cc at 25° C, stopper the flask and mix thoroughly. Proceed as directed for the *assay of nitrites*, using 10 cc of the alcoholic solution. One cc of tenth normal sodium thiosulfate is equivalent to 0.01171 Gm of $C_6H_{11}NO_2$.

Assay of nitrites—The gasometric assay of organic nitrites has been deleted and replaced by an iodometric assay. An acidified solution of potassium iodide reacts with a nitrite as expressed by the following equation $2KI + 2HCl + 2C_6H_5NO_2 \rightarrow 2KCl + 2C_6H_5OH + 2NO + I_2$

The liberation and titration of the iodine must be carried out in an oxygen free atmosphere in order to prevent oxidation by atmospheric oxygen of NO to N_2O_3 with subsequent liberation of additional iodine. It is only necessary to bubble carbon dioxide through the mixture contained in a flask as described below to prevent this oxidation, and the carbon dioxide may be supplied from a cylinder of compressed gas or from any laboratory type of gas generator.

Apparatus Fit a 300 cc Erlenmeyer flask (or wide mouth bottle) with a 2 hole rubber stopper. Through one hole pass an aeration tube leading to the bottom of the flask and constricted to an internal diameter of about 1 mm at the lower end. Through the other hole pass a glass tube of at least 6 mm internal diameter, which will extend about 1 cm above and below the stopper. Connect the aeration tube with a cylinder or generator of carbon dioxide.

Method Place 10 Gm of potassium iodide in the flask and add 40 cc of boiling deaerated distilled water. Insert the stopper in the flask and pass a stream of carbon dioxide through the flask at a rate of five bubbles per second until the solution has cooled to room temperature. Add 10 cc of dilute hydrochloric acid (1 in 2) and continue the stream of carbon dioxide for at least three minutes. If any iodine is liberated as shown by the appearance of a yellow color, cautiously add tenth normal sodium thiosulfate from a burette, through the outlet tube, until the color is just discharged.

Decrease the flow of carbon dioxide to about 2 bubbles per second and add the directed volume of the nitrite solution to be assayed with a transfer pipette passing the pipette through the outlet tube until the tip is just above the surface of the potassium iodide solution. Touch the tip of the pipette to the outlet tube to remove adhering nitrite solution, then rinse the outlet tube with a fine jet of aldehyde free alcohol from a wash bottle. At once titrate the liberated iodine with tenth-normal sodium thiosulfate introducing the tip of the burette through the outlet tube.

One cc of tenth normal sodium thiosulfate is equivalent to

Amyl nitrite, $C_6H_{11}NO_2$	0.01171 Gm
Ethyl nitrite, $C_2H_5NO_2$,	0.007505 Gm
Glyceryl trinitrate, $C_3H_5(NO_3)_3$,	0.0113 Gm

Caution When assaying amyl nitrite, the alcoholic solution of the nitrite must not be used later than thirty minutes after its preparation. If more time has elapsed a fresh solution must be prepared.

Antipyryna—A new test for identity is given. To 0.1 Gm of Antipyryne add 0.1 Gm of vanillin, 5 cc of distilled water and 2 cc of sulfuric acid and heat the mixture to boiling. It develops an orange-yellow precipitate.

Apomorphina Hydrochloridum—The identity test with sodium bicarbonate has been replaced by the following. To 5 cc of an aqueous solution of Apomorphine Hydrochloride (1 in 100) add a slight excess of a solution of sodium bicarbonate (1 in 20). A white or greenish white precipitate is formed. Add 3 drops of tincture of iodine and shake the mixture vigorously. An emerald green solution is produced. Add 5 cc of ether and after vigorous shaking allow the

layers to separate the ether solution is colored deep ruby red, while the aqueous layer retains its green color

Argentum Proteimicum Forte (Argento Proteimicum Forte U S P X) —The yeast test is replaced by the following Dissolve 1 Gm of Strong Protein Silver in 10 cc of distilled water Add, all at once, 7 Gm of reagent ammonium sulfate and stir until coagulation takes place Filter and to the clear filtrate add 3 drops of hydrochloric acid a white precipitate is formed (distinction from mild protein silver)

Argentum Proteimicum Mite (Argento-Proteimicum Mite U S P X) —The yeast test is replaced by the following Dissolve 1 Gm of Mild Protein Silver in 10 cc of distilled water Add, all at once, 7 Gm of reagent ammonium sulfate and stir until coagulation takes place Filter, and to the filtrate add 3 drops of hydrochloric acid no precipitate is formed (distinction from strong protein silver)

Arsphenamina —The following tests for purity have been introduced Dilute 10 cc of Arsphenamine solution (1 in 100) in a small flask or beaker with 50 cc of distilled water Add 5 drops of phenolphthalein T S and titrate with tenth-normal sodium hydroxide, watching the supernatant liquid for the end point not less than 3.9 cc and not more than 4.2 cc of tenth normal sodium hydroxide will be required

Add 0.6 Gm of Arsphenamine to 20 cc of distilled water in a small flask or cylinder and agitate gently a complete solution results within fifteen minutes

Expose the ampuled product to a temperature of 56° C for a period of forty eight hours it shows no marked change in color, consistency or solubility

The following caution is appended The solution must be alkalinized with 0.85 cc of normal sodium hydroxide for each 0.1 Gm of Arsphenamine prior to injection

Atropina and Atropina Sulfas —The carbonization test with sulfuric acid is standardized in terms of color

Balsamum Tolutanum (Tolu U S P X) —The test for rosin is modified Shake about 2 Gm of Tolu Balsam with 20 cc of carbon disulfide allow it to stand for thirty minutes, filter the liquid and evaporate the filtrate to dryness Triturate the residue with 10 cc of petroleum benzine and filter the solution into a dry test-tube Add 5 cc of a sulfuric acid solution (made by mixing equal volumes of sulfuric acid and distilled water and cooling the mixture), shake vigorously, allow the mixture to settle and add acetic anhydride drop by drop no red, violet or purple band is formed (rosin, rosin oil or copaiba)

Barbitalum —The identity test with mercuric nitrate T S is changed slightly, as follows A saturated aqueous solution of Barbital yields with mercuric nitrate T S a white precipitate which is soluble in ammonia T S

The carbonization test with sulfuric acid is standardized in terms of color

Barbitalum Solubile —The carbonization test with sulfuric acid is standardized in terms of color

Benzinum Purificatum —It is directed to determine the residue upon evaporation at 40° C in a glass or porcelain dish

Belanaphthol —The volume of ammonia T S used in the solubility test is increased from 25 cc to 30 cc

Caffeine —The temperature for the drying of Caffeine is changed from 100° C to 80° C

The carbonization test with sulfuric acid is standardized in terms of color

Caffeina Citrata —The temperature for the drying of Citrated Caffeine, and the caffeinic residue therefrom, is changed from 100° C to 80° C

Slight changes are made in the assay for caffeine The volume of sodium hydroxide T S is reduced to 8 cc and the caffeine is extracted with three or more 20 cc portions of chloroform

Caffeina cum Sodii Benzoate (Caffeina Sodii-Benzoas U S P X) —The temperature for the drying of Caffeine with Sodium Benzoate, and the caffeinic residue therefrom is changed from 100° C to 80° C

The carbonization test with sulfuric acid is standardized in terms of color

Calcii Iodobehenas —The tests for identity have been amended by deleting the test for iodine with sulfuric acid and chloroform, and by introducing a test for calcium in the ash

Camphora —Synthetic Camphor is recognized as well as the natural product

The specific rotation $[\alpha]_D^{25}$ of synthetic camphor is between +5° and -5°

Mix 0.1 Gm of finely divided Camphor with 0.2 Gm of sodium peroxide in a clean, dry hard glass test tube of about 25 mm internal diameter and 20 cm in length. Suspend the tube at an angle of about 45° by means of a clamp placed at the upper end, and gently heat the tube, starting at the upper end and gradually bringing the heat toward the lower part of the tube until incineration is complete. Dissolve the residue in 25 cc of warm distilled water, acidify with nitric acid and filter the solution into a comparison tube. Wash the test-tube and filter with two portions of 10 cc each of hot distilled water, adding the washings to the filtered solution. Add to the filtrate 0.5 cc of tenth normal silver nitrate, dilute with distilled water to 50 cc and mix thoroughly. The turbidity is no greater than that produced in a control test with the same quantities of the same reagents and 0.05 cc of fiftieth normal hydrochloric acid (*halogens*).

Carbo Activatus—(Replacing *Carbo Ligni U S P X*)—A copy of the monograph may be obtained from the Chairman of the Committee of Revision. See also JOUR A PH A 24, 630 (1935).

Carbones Tetrachloridum—The carbonization test with sulfuric acid is standardized in terms of color. In the test for the presence of carbon disulfide, dehydrated alcohol is replaced by alcohol.

Carbromalum—The carbonization test with sulfuric acid is standardized in terms of color.

Cera Alba and Cera Flava—A test for carnauba wax has been added. Place 0.1 Gm of Yellow (White) Wax in a test tube and add 20 cc of *n* butanol. Immerse the test-tube in boiling water and shake the mixture gently until solution is complete. Immerse the test-tube in a beaker of water at 60° C and allow it to cool to room temperature during a period of two hours. A loose mass of fine, needle like crystals separates from a clear mother-liquor. Under the microscope the crystals are loose needles or stellate clusters, without the presence of amorphous masses (*carnauba wax*).

Chloralis Hydras—The carbonization test with sulfuric acid is standardized in terms of color.

Chloramina-T (Chloramina U S P X)—The carbonization test with sulfuric acid is standardized in terms of color.

Chlorobutanol—A new admission. A copy of the monograph may be obtained from the Chairman of the Committee of Revision.

Chloroformum—The specific gravity 1.474 to 1.478 at 25° C is transferred to the 'Tests for purity' since it is a very accurate indication of the alcohol content of the Chloroform.

The test for *substances decomposable by sulfuric acid* is standardized in terms of color.

Two new tests are added. Agitate 3 cc of Chloroform with 10 cc of ammonia free distilled water in a glass stoppered cylinder for five minutes. After the liquids separate transfer 5 cc of the water extract to another glass stoppered cylinder containing 40 cc of ammonia free distilled water, and add 5 cc of alkaline mercuric potassium iodide T S. No turbidity or precipitate will develop within one minute (*aldehydes and ketones*).

Into each of two 50-cc glass stoppered cylinders of colorless glass, having an internal diameter of 20 mm, place 10 cc of distilled water, two drops of phenolphthalein T S and enough hundredth normal sodium hydroxide to produce, after vigorous shaking, pink tints of equal intensity. Into one of the cylinders measure exactly 20 cc of chloroform and again shake the mixture well. Add hundredth normal sodium hydroxide, drop by drop, from a burette, shaking the mixture well after each addition, until the pink color is reproduced in an intensity equal to that in the cylinder without the Chloroform. Not more than 0.20 cc of hundredth normal sodium hydroxide is required to produce a pink color, which is permanent for fifteen minutes (*acids and phosgene*).

Cocaina and Cocainæ Hydrochloridum—The carbonization test with sulfuric acid is standardized in terms of color.

Codeina—The carbonization test with sulfuric acid is standardized in terms of color.

Codeinæ Phosphas—Codeine Phosphate must now contain not less than 70 per cent of anhydrous codeine, an increase of 3 per cent, and the water of hydration shown in the chemical formula is reduced to 1½ molecules.

Copaiba—The lower limit of non volatile resin is reduced to 27 per cent.

Creosotum—Creosote begins to distil at about 203° C and not less than 90 per cent of it by volume distils between 203° and 220° C when determined by Method II under *Boiling and Distilling Points*. This is an increase of 3° in the minimum boiling point.

Dextrosium — Dextrose loses not less than 8 per cent and not more than 10 per cent of its weight when dried to constant weight at 105° C. This fixes a minimum as well as a maximum moisture content.

Dichloramina T (Dichloramina U S P X) — The carbonization test with sulfuric acid has been deleted.

Emetina Hydrochloridum — The water content has been changed from a maximum of 19 per cent to not less than 8 per cent and not more than 16 per cent.

The carbonization test with sulfuric acid is standardized in terms of color.

Ephedrina — A new admission. A copy of the monograph may be obtained from the Chairman of the Committee of Revision.

Ephedrina Hydrochloridum — A new admission. A copy of the monograph may be obtained from the Chairman of the Committee of Revision.

Ephedrina Sulfas — A new admission. A copy of the monograph may be obtained from the Chairman of the Committee of Revision.

Epinephrina — A new test for purity is added. Dissolve 1 Gm. of Epinephrine, dried to constant weight over sulfuric acid, in 15 cc. of half-normal hydrochloric acid; the solution is clear. Add to this solution sufficient half-normal hydrochloric acid to make a volume of 20 cc. at 25° C. The specific rotation $[\alpha]_D$ of this solution at 25° C., and using a 200 mm. tube, with sodium light, is not less than -50° and not more than -53.5° .

Erythritylis Tetrantras Dilutus — A new admission. A copy of the monograph may be obtained from the Chairman of the Committee of Revision.

Fluoresceinum Solubile — A new admission. A copy of the monograph may be obtained from the Chairman of the Committee of Revision.

Gelatinum — In the place of the statement that a solution of Gelatin forms a firm, transparent or translucent jelly on standing for several hours at 6° C., there is introduced a new test for jelly strength. Place 0.1 Gm. of Gelatin, accurately weighed in a test-tube about 150 mm. in length and having an internal diameter of 15 mm., and add enough distilled water to make the mixture measure exactly 10 cc. at 25° C. Place a stirring rod in the tube and allow it to stand, with occasional stirring, for six hours. Place the tube in a bath of boiling water and stir until the Gelatin is completely dissolved and the solution thoroughly mixed. At once remove the stirring rod, stopper the tube tightly and allow it to stand in a refrigerator over night. Place the tube in a bath of ice water for thirty minutes, then allow the temperature of the bath to rise slowly. When the temperature of the bath reaches 10° C. the jelly does not flow when the test-tube is laid on its side.

The test for arsenic has been modified. Heat 15 Gm. of Gelatin with 60 cc. of dilute, arsenic-free hydrochloric acid (1 in 4) in a covered flask until all insoluble matter is flocculated and the Gelatin dissolved. Add an excess of bromine T.S. (about 15 cc.) neutralize with ammonia T.S., add 1.5 Gm. of sodium phosphate and allow to cool. Add a slight excess (about 30 cc.) of magnesia mixture T.S., allow to stand for one hour, filter and wash with 5-10 cc. portions of ammonia T.S., diluted with 3 volumes of water. Drain the precipitate well and dissolve it in dilute arsenic-free hydrochloric acid (1 in 4) to a volume of exactly 50 cc. Subject 5 cc. of this solution to the test for arsenic. The stain, if any, is not more intense than that produced in a test made with similar quantities of the same reagents and 1.5 cc. of the standard arsenic test solution.

Glycerinum — The carbonization test with sulfuric acid is standardized in terms of color.

Gossypium Purificatum — The test for fatty matter has been amended by prescribing extraction in a Soxhlet apparatus. The limit of fatty matter is unchanged, but it is directed that the ethereal solution may have no blue, green or brownish color.

Histamina Phosphas — A new admission. A copy of the monograph may be obtained from the Chairman of the Committee of Revision.

Hydrargyri Succinidum — A new admission. A copy of the monograph may be obtained from the Chairman of the Committee of Revision.

Iodophthalinum — A new admission. A copy of the monograph may be obtained from the Chairman of the Committee of Revision.

Lactosum — No changes have been made over those announced for the interim revision official January 1, 1934, except that it is directed to add 0.2 cc. of ammonia T.S. to the solution used for determination of the specific rotation.

Linimentum Camphoræ—The assay for camphor is conducted by volatilizing the camphor in a current of carbon dioxide

Linimentum Chloroformi—An assay has been introduced for this liniment and for Spiritus Chloroformi For details see JOUR A PH A, 22 540-544 (1933) 100 cc of the Liniment contains, in each 100 cc, not less than 40 Gm and not more than 45 Gm of CHCl_3

Liquor Cresolis Saponatus (Liquor Cresolis Compositus U S P X)—The assay has been amended by substituting a saturated solution of calcium chloride for the solution of sodium chloride previously used for washing the recovered cresol The cresol is then dried over anhydrous calcium chloride (No 4 mesh) instead of ignited potassium carbonate

Liquor Epinephrini Hydrochloridi—The use of an approved preservative is authorized

Liquor Ergosterolis Irradiati—A new admission A copy of the monograph may be obtained from the Chairman of the Committee of Revision

Liquor Formaldehydi—Bromthymol blue T S is introduced as the indicator for the determination of acidity and in the assay

Liquor Histaminæ Phosphatis—A new admission A copy of the monograph may be obtained from the Chairman of the Committee of Revision

Liquor Parathyroides—A new admission A copy of the monograph may be obtained from the Chairman of the Committee of Revision

Liquor Pituitarii Posterioris (Liquor Pituitarii U S P X)—An approved preservative may be added

Mel—The method for the determination of ash has been modified Weigh accurately about 10 Gm of Honey into a platinum dish, add a few drops of olive oil to prevent spattering heat carefully until swelling ceases and ignite not above dull redness until a white ash is obtained not more than 0.3 per cent of ash remains

Merbaphenum—A new admission A copy of the monograph may be obtained from the Chairman of the Committee of Revision

Methylthioninæ Chloridum—Methylthionine Chloride contains, when dried to constant weight at 110°C , not less than 98.5 per cent of $\text{C}_{16}\text{H}_{18}\text{N}_3\text{ClS}$

The test for zinc is modified to detect copper as well Heat 0.5 Gm of Methylthionine Chloride at a temperature below a red heat until it is completely carbonized, boil the powdered residue with 10 cc of diluted nitric acid for five minutes, filter and wash the residue with 10 cc of distilled water Boil the combined filtrate and washings with 1 cc of nitric acid, add an excess of ammonia T S and filter if necessary the liquid remains clear upon the addition of an equal volume of hydrogen sulfide T S (copper or zinc)

Assay Place about 0.2 Gm of Methylthionine Chloride dried to constant weight at 110°C and accurately weighed in a 500 cc volumetric flask and dissolve it in 100 cc of distilled water Add 50 cc of sodium acetate solution (1 in 10) and mix thoroughly then add from a burette 50 cc of tenth normal iodine keeping the mixture in constant rotation Stopper the flask and allow the mixture to stand for fifty minutes shaking it vigorously at intervals of ten minutes Add distilled water to make the mixture measure 500 cc mix thoroughly, allow to stand for ten minutes and filter through a filter that has not been previously moistened Reject the first 30 cc of filtrate Determine the excess of iodine by titration of 100 cc of the subsequent filtrate with tenth-normal sodium thiosulfate Each cc of tenth-normal iodine is equivalent to 0.005328 Gm of $\text{C}_{16}\text{H}_{18}\text{N}_3\text{ClS}$

Neoarsphenamina—The rubric is amended by requiring not less than 19 per cent and not more than 22 per cent of As

Some modifications of the tests for identity are introduced

A new test for purity is added Expose the ampuled product to a temperature of 56°C for forty eight hours it should show no marked change in color, consistency or solubility

Neocinchophenum—A new admission replacing Cinchophenum A copy of the monograph may be obtained from the Chairman of the Committee of Revision

Oleum Amygdalæ Expressum—In the test for various foreign oils, it is now directed to cool the liberated fatty acids to 15°C and allow to stand for thirty minutes without stirring

The solidification point of the fatty acids is fixed at not less than 9° and not more than 12°C

Oleum Chaulmoogra—The definition is changed to read The fixed oil expressed from the ripe seeds of *Taraktogenos Kurzii* King, *Hydnocarpus Wightiana* Blume or *Hydnocarpus an*

thelmintica Pierre (Fam *Flacourtiaceæ*) The fixed oil expressed from the ripe seeds of other species of *Hydnocarpus* (Fam *Flacourtiaceæ*) when designated as such and when conforming with the description, physical properties and tests for identity and purity prescribed below, may be used

The minimum free acidity has been deleted, and the maximum reduced to 40 cc of tenth-normal alkali for 10 Gm of oil

A new test for purity has been added Place 25 cc of Chaulmoogra Oil in a measuring tube consisting of a glass stoppered, pear shaped bulb of not less than 100 cc capacity, joined at its lower, tapering end to a tube about 30 cm long, graduated to 25 cc in divisions of 0.1 cc Add 100 cc of neutralized alcohol and shake the mixture thoroughly for not less than ten minutes Allow the tube to stand for twenty-four hours and observe the volume of the lower layer Its volume is not less than 23.5 cc (*free fatty acids or castor oil*)

The lower limit of iodine value has been reduced from 98 to 93

Oleum Gossypii Seminis—The solidification point of the fatty acids has been fixed as not less than 28° and not more than 35° C

Oleum Iodatum (*Iodized Oil*)—A new admission A copy of the monograph may be obtained from the Chairman of the Committee of Revision

Oleum Lini—The color test for rosin or rosin oil has been corrected Warm 10 cc of Lin seed Oil with an equal volume of acetic anhydride in a test-tube until solution is effected allow the mixture to cool, then separate the lower anhydride layer and filter it through a small filter moistened with acetic anhydride Place 2 or 3 drops of the filtrate on a white porcelain surface and add 1 drop of sulfuric acid a violet color is not produced in the mixture

Oleum Maydis (*Corn Oil*)—A new admission A copy of the monograph may be obtained from the Chairman of the Committee of Revision

Oleum Morrhuæ and *Oleum Morrhuæ Non Destearinatum*—The corrected monographs for these have already appeared as interim revisions of U S P X

Oleum Olivæ—The free fatty acids in 10 Gm of oil require for neutralization not more than 5 cc of tenth normal alkali

In the test for peanut oil the volume of 90 per cent alcohol used to dissolve the dry fatty acids is increased from 50 cc to 60 cc

The range of iodine value is changed from 79 to 88

The solidification point of the fatty acids is from 17° to 26° C

Oleum Theobromatis—The specific gravity is changed to from 0.858 to 0.864 at $\frac{100^{\circ}}{25^{\circ}}$ C

The range of iodine value becomes 35 to 40

The solidification point of the fatty acids is from 45° to 50° C

Pancreatinum—The assay for starch digestive power has been modified Determine the percentage of moisture in potato starch by drying about 0.5 Gm, accurately weighed, at 120° C for four hours Thoroughly mix a quantity of the starch equivalent to 3.75 Gm of dry starch with 10 cc of cold distilled water Add the mixture with constant stirring to 75 cc of distilled water, previously heated to from 50° to 60° C, contained in a tared 250-cc beaker Rinse the remaining starch into the beaker with 10 cc of distilled water, heat the mixture to boiling and boil it gently with constant stirring for five minutes, or until a translucent, uniform paste is obtained Add enough distilled water to make the mixture weigh 100 Gm, cool the paste to 40° C and place the beaker in a water bath maintained at 40° C Suspend 0.15 Gm of Pancreatin in 5 cc of distilled water and add the suspension to the starch paste, mixing it well by pouring the mixture from beaker to beaker for thirty seconds, noting the time when the *Pancreatin* suspension was added to the starch Maintain the mixture at a temperature of 40° C for exactly five minutes At once add 0.1 cc of this mixture to a previously made mixture of 0.2 cc of tenth-normal iodine and 60 cc of distilled water at a temperature of from 23° to 25° C, no blue, red or violet color is produced

Paraffinum—In place of the test with cold sulfuric or nitric acid, a carbonization test with sulfuric acid is introduced Pour 5 cc of Paraffin, at a temperature just above its melting point, and 5 cc of sulfuric acid, into a glass stoppered cylinder, which has been previously rinsed with sulfuric acid and heat in a water-bath at 60° C for ten minutes, shaking the mixture at intervals of one minute the paraffin remains unchanged in color, and the acid does not become darker than pale amber

Paraldehydum—The congealing point has been raised to not less than 11° C

In place of the potassium hydroxide test for aldehyde there has been substituted the following Place 100 cc of distilled water in a 300 cc Erlenmeyer flask, add 5 cc of Paraldehyde and shake the mixture gently until solution is complete Add 5 cc of a solution of hydroxylamine hydrochloride (made by dissolving exactly 3.5 Gm of hydroxylamine hydrochloride in enough distilled water to make 100 cc of solution) Shake the mixture gently for thirty seconds, add 2 drops of methyl orange T S and titrate immediately with half-normal sodium hydroxide Perform a blank determination with 5 cc of the hydroxylamine hydrochloride solution added to 100 cc of distilled water, the difference between the two titrations does not exceed 1 cc of half normal sodium hydroxide (*acetaldehyde*)

Pepsinum—Pepsin digests not less than 3000 and not more than 3500 times its weight of egg albumen

Assay Mix 35 cc of normal hydrochloric acid with 385 cc of distilled water Dissolve 0.1 Gm of Pepsin in 150 cc of this acid Likewise dissolve 0.1 Gm of Reference Pepsin in another portion of 150 cc of this dilute acid Immerse one or more hen's eggs in boiling water during fifteen minutes Cool them rapidly to room temperature by immersion in cold water, remove the shell and pellicle and all of the yolk and at once rub the albumen through a clean dry, No. 40 sieve rejecting the first portion that passes through the sieve Place 10 Gm of the succeeding well mixed portion in each of three wide mouth bottles of about 100 cc capacity Immediately add 35 cc of the dilute acid at one time or in portions and, by suitable means, disintegrate thoroughly the particles of albumen Place the bottles in a water-bath at 52° C After the contents of the bottles have reached that temperature add exactly 5 cc of the acidulated solution of Pepsin to one bottle 4.30 cc of the same solution and 0.70 cc of the dilute acid to another bottle and exactly 5 cc of the acidulated solution of Reference Pepsin to the third bottle At once stopper the bottles securely, invert them three times and maintain them at a temperature of 52° C for two and one half hours agitating the contents equally every ten minutes by inverting the bottles once Remove the bottles from the bath pour the contents into 100-cc conically shaped measuring vessels, having diameters not exceeding 1 cm at the bottom, and graduated from the tip to the 10 cc mark in 0.05 cc divisions and from the 10 cc to the 50 cc mark in 0.1 cc divisions, and having the internal taper as nearly identical as possible Transfer the undigested egg albumen which adheres to the sides of the bottles to the respective measuring vessels with the aid of small portions of distilled water until 50 cc has been used for each Mix the contents of each measuring vessel and allow them to stand for thirty minutes The volume of the undissolved albumen in the measuring vessel corresponding to the 50 cc of the solution of Pepsin being assayed shall not be more than the volume of the undissolved albumen in the measuring vessel corresponding to the 50 cc of the Reference Pepsin solution, and the volume of the undissolved albumen in the measuring vessel corresponding to 4.30 cc of the solution of Pepsin being assayed shall not be less than the volume of the undissolved albumen in the measuring vessel corresponding to the 50 cc of the Reference Pepsin solution

Reference Pepsin may be obtained from the Chairman of the Committee of Revision

Petrolatum—The carbonization test with sulfuric acid has been standardized The concentration of acid used must be between 94.5 and 95.5 per cent of H₂SO₄ determined by titration See JOUR. A. PH. A. 22:956-961 (1933)

Phenacaine—A new admission A copy of the monograph may be obtained from the Chairman of the Committee of Revision

Phenobarbitalum—The tests for identity have been modified

The carbonization test with sulfuric acid has been standardized in terms of color

Phenobarbitalum Solubile—A new admission A copy of the monograph may be obtained from the Chairman of the Committee of Revision

Phenolphthaleinum—The melting point is fixed at not below 258° C an increase of 2°

Physostigma Salicylas—The carbonization test with sulfuric acid is standardized in terms of color

Pilocarpina Nitras—The carbonization test with sulfuric acid is standardized in terms of color

Procaine Hydrochloridum—The carbonization test with sulfuric acid is standardized in terms of color

Pulvis Chinofoni—A new admission A copy of the monograph may be obtained from the Chairman of the Committee of Revision

Quinidinae Sulfas—The carbonization test with sulfuric acid has been standardized in terms of color

Quinina—The carbonization test with sulfuric acid has been standardized

Quininae Bisulfas—The carbonization test with sulfuric acid has been standardized

Quininae Dihydrochloridum—The carbonization test with sulfuric acid has been standardized

Quininae et Ureae Hydrochloridum—The carbonization test with sulfuric acid has been standardized

Quininae Sulfas—The dihydrate replaces the heptahydrate as the official form The official solubility figures are changed as a result

The loss in weight on drying at 100° C must not exceed 5 per cent

The carbonization test with sulfuric acid is standardized

Resina—The definition has been changed to read Rosin is a solid resin obtained from *Pinus palustris* Miller, and from other species of *Pinus* (Fam *Pinaceae*) This will admit rosin produced by the so called steam-solvent process, if it complies in other respects with the monograph

Saccharinum (Glusidum U S P X)—The carbonization test with sulfuric acid has been standardized

Santoninum—The carbonization test with sulfuric acid has been standardized

Sapo Durus (Sapo U S P X)—The definition has been altered to read simply "Soda Soap" The monograph has been so amended as to apply only to soaps that have the chemical and physical characteristics of a soap produced by the saponification of olive oil with sodium hydroxide It is well known that soaps having these characteristics may be produced from other than olive oil, and that there are no chemical tests that will satisfactorily distinguish such soaps from an olive oil soap It has therefore seemed the part of wisdom for the Pharmacopœia to recognize such a condition and provide a workable rather than a useless definition

The caustic alkalinity or free acidity in 2.5 Gm of the soap, determined in the alcoholic extract, requires for neutralization not more than 0.2 cc of tenth normal acid or alkali, using phenolphthalein T S as the indicator The carbonate alkalinity, determined in the alcohol-insoluble residue requires not more than 2 cc of tenth normal acid for neutralization using methyl orange T S as the indicator

When the fatty acids are separated from the soap solution by acidifying, washing and drying, their solidifying point is not less than 18° and not more than 23° C, their acid value is not less than 185 and not more than 205 and their iodine value is not less than 83 and not more than 92

Sapo Mollis—The soap may be made with potassium hydroxide exclusively, if desired

Soft soap must contain not more than 0.25 per cent of caustic alkali calculated as potassium hydroxide, when determined by titration of the alcoholic extract from 5 Gm of Soap with tenth normal sulfuric acid using phenolphthalein T S as the indicator

The alcohol insoluble residue from the same sample will require, for neutralization, when dissolved in water, not more than 2.5 cc of tenth normal sulfuric acid, using methyl orange T S as the indicator (*carbonate alkalinity*)

The acid value of the liberated fatty acids is not less than 190 and not more than 205, and the iodine value is not less than 170

Sodii Cacodylas—The permissible free acidity in 2 Gm has been reduced to an equivalent of 0.5 cc of tenth normal sodium hydroxide

Spiritus Ethylis Nitritus—This is assayed iodometrically, as already described The assay is performed upon 10 cc of the Spirit, which is not previously shaken with powdered potassium bicarbonate and the weight of sample taken is calculated from its specific gravity at 25° C Each cc of tenth normal sodium thiosulfate is equivalent to 0.007505 Gm of C₂H₅NO

Spiritus Camphoræ—Because of the admission of synthetic camphor, which is optically inactive it has been necessary to introduce a chemical assay Accurately measure 25 cc of Spirit of Camphor into a 300-cc Erlenmeyer flask, and add slowly, with constant shaking, 75 cc of dinitrophenylhydrazine T S (a solution of 1.5 Gm of dinitrophenylhydrazine in 100 cc of 1 in 10

sulfuric acid) Connect the flask with a reflux condenser and heat on a water bath for four hours Allow the mixture to cool, add 200 cc of dilute sulfuric acid (1 in 50), and set the mixture aside for twenty-four hours Transfer the precipitate to a previously dried and weighed Gooch crucible and wash with 10 cc portions of cold distilled water until the last washing is not acid to litmus paper Continue the suction until the excess water is removed, and dry the crucible and precipitate to constant weight at 80° C The weight of the precipitate, multiplied by 0.458, equals the weight of camphor in 25 cc of the Spirit of Camphor taken for the assay

Spiritus Chloroformi—An assay has been introduced For details see JOUR A PH A, 22 540-544 (1933)

Spiritus Frumenti—The limit of acidity has been changed A 25 cc portion should require not less than 2 cc and not more than 6 cc of tenth normal sodium hydroxide for neutralization

The limit for esters using the method of U S P X, is now not less than 2 cc nor more than 8 cc of tenth normal sodium hydroxide

Mercuric sulfate T S is now used as the reagent for acetone, replacing sodium nitroprusside as described under Alcohol

Slight modifications have been made in the details of the other tests for impurities

Spiritus Glycerylis Nitratis—A new assay is given Transfer 25 cc of Spirit of Glycerol Trinitrate to a previously weighed, 50 cc volumetric flask, stopper the flask and weigh accurately Add 3 cc of an aqueous solution of sodium hydroxide (1 in 5), re stopper the flask and allow it to stand at room temperature for one hour Then add sufficient aldehyde free alcohol to make the total volume measure 50 cc, stopper and mix thoroughly Assay 20 cc of this solution according to the method for the assay of nitrites One cc of tenth normal sodium thiosulfate is equivalent to 0.0113 Gm of glyceryl trinitrate

Spiritus Vini Vitis—Tests for purity are based upon those found under Spiritus Frumenti

Strychnina Nitras—The carbonization test with sulfuric acid has been standardized

Strychnina Sulfas—Strychnine Sulfate loses not more than 11.5 per cent of its weight upon drying at 100° C

The carbonization test with sulfuric acid has been standardized

Styrax—A test for rosin and rosin oil is introduced Triturate about 2 Gm of Storax with 25 cc of petroleum benzine in a small beaker for five minutes Filter the mixture, and place 10 cc of the filtrate in a dry test-tube Add 5 cc of dilute sulfuric acid (made by mixing equal volumes of sulfuric acid and distilled water and cooling the mixture) shake it vigorously, and allow the mixture to settle Add acetic anhydride, drop by drop the mixture exhibits no violet or purple band

Tabella Glycerylis Trinitratis—A new admission A copy of the monograph may be obtained from the Chairman of the Committee of Revision

Theophyllina—The carbonization test with sulfuric acid has been standardized

Theophyllina cum Aethylenediamina—A new admission A copy of the monograph may be obtained from the Chairman of the Committee of Revision

Theophyllina cum Sodii Acetate—A new admission A copy of the monograph may be obtained from the Chairman of the Committee of Revision

Thyroideum—A detailed description of the appearance of the powder under the microscope has been added

Thyroid contains not more than 6 per cent of moisture determined by the toluene distillation method

The limit of ash has been removed to permit the use of sodium chloride as a preservative

The assay directions have been elaborated see JOUR A PH A 24 742-748 (1935)

Tryparsanum—A new admission A copy of the monograph may be obtained from the Chairman of the Committee of Revision

If trade be a calling in which material goods are sold and a profession one in which knowledge is sold—and this seems to be one essential difference between them—then I am sure that the professional side of pharmacy is fated greatly to increase in this country (Great Britain)
—SIR FREDERICK GOWLAND HOPKINS

HOUSE OF DELEGATES, AMERICAN PHARMACEUTICAL ASSOCIATION

ABSTRACTS OF THE MINUTES OF THE SESSIONS HELD IN MULTNOMAH HOTEL, PORTLAND, ORE., AUGUST 5-10, 1935

The First Session of the House of Delegates was convened by Chairman Rowland Jones, Jr., at 1 30 P M., Tuesday, August 6, 1935, he welcomed the delegates present. The roll call showed that a quorum was present and the House of Delegates was declared organized for business.

The names of delegates and organizations represented follow. The name of the organization or state is in *Italics*; names of delegates in capitals and small capitals and the names of voting delegates in bold face.

The minutes of the House of Delegates are printed here and to avoid duplication in printing will also answer for the reports of the transactions made to the General Sessions—the reports are abstracts of the minutes.

The names of the delegates follow

A PH A SECTIONS

Scientific—L W ROWE, Detroit Mich
Education and Legislation—George C Schicks Newark N J O E RUSSELL Elkhart Ind L W RISING Seattle Wash
Practical Pharmacy and Dispensing—Ralph W Clark, Madison Wis
Historical—LOUIS GERSHENFELD Philadelphia Pa C O Lee, La Fayette Ind JOHN T LLOYD Cincinnati O
Commercial Interests—Henry Brown Scranton Pa
Conference of Pharmaceutical Association Secretaries—Charles J Clayton, Denver Colo
Conference of Pharmaceutical Law Enforcement Officials—Joseph P Murray, Colorado Springs Colo LINN F JONES Portland Ore WALTER F MEADS Des Moines Iowa
Plant Science Seminar—F H Eby Philadelphia Pa C E MOLLETT Missoula Mont
National Conference on Pharmaceutical Research—George D Beal, Pittsburgh Pa W J HUSA Gainesville Fla JOHN C KRANTZ JR Baltimore Md

A PH A BRANCHES

Baltimore—John C Krantz Jr J GILBERT JOSEPH
Chicago—Lawrence Templeton W B DAY E N GATHERCOAL C M SNOW I A BECKER WIL LIAM GRAY
Cincinnati—F H Freericks, BERNARD KOTTE C G MERRELL
Detroit—H M Whitney, L W ROWE R T LAKEY
New York—Hugo H Schaefer H V ARNY JOSEPH ROSIN
North Pacific—Frank Nau FREDERICK GRILL EARL GUNTHER
Northern New Jersey—R W Rodman, ERNEST LITTLE G C SCHICKS
Northern Ohio—Edward Spease F J BACON
Philadelphia—AMBROSE HUNSBERGER F H Eby, F P STROUP
Pittsburgh—C Leonard O'Connell, LOUIS EMANUEL

NATIONAL ASSOCIATIONS

American Association of Colleges of Pharmacy—C B Jordan La Fayette Ind EDWARD SPEASE Cleveland O ROLAND T LAKEY Detroit Mich
American Drug Manufacturers Association—F E Bibb Indianapolis Ind F O TAYLOR Detroit Mich
National Association Boards of Pharmacy—C Thurston Gilbert Noroton Conn C S PIERCE Spring vale Me R C SHULTZ Worland Wyo J M ROBERTSON Phoenix Ariz
National Association of Retail Druggists—Harvey A Henry, Los Angeles Calif JOHN WITTY Portland Ore GEORGE L SECOND Chicago Ill JOHN W DARGAVEL Chicago Ill
National Wholesale Druggists—H J Frank Portland Ore C H CARTRIDGE Seattle Wash C F OSMER Tacoma Wash

Proprietary Association—Samuel T Helms Baltimore Md P I HEUSSLER Baltimore Md G F REDDISH St Louis Mo J F HOGE New York City

STATE ASSOCIATIONS

Alabama—L C LEWIS
California—F E Mortenson, ROY S WARNACK HAR VEY A HENRY
Colorado—C J Clayton A D BAKER WM J BISHOP
Connecticut—Alice Esther Garvin H P BEIRNE
District of Columbia—Paul Briggs, CHARLES FUHRMANN S L HILTON
Florida—W J HUSA, JAMES H BEAL
Georgia—R C Wilson C H EVANS
Idaho—E O LEONARD CHARLES CARTER R F CURTIS Frank L Christenson
Illinois—Wm Gray, IRWIN BECKER ALBERT ZIMMERMAN
Indiana—F V McCullough EDGAR O HARROW E H NILES C B JORDAN F E BIBBINS
Iowa—George Judisch, GEORGE W GILLMAN
Kansas—W H Varnum
Kentucky—G L Curry A P MARKENDORF ALBERT E ELY LINDOOD BROWN FRANK PATTERSON
Louisiana—John F McCloskey
Maine—Leon H Mart ADOLPH RIVARD
Maryland—R L Swain GEORGE A BUNTING
Massachusetts—Timothy S Shea
Michigan—C F Allan, B S PERC M N HENRY E E DURHAM JOSEPH BURNIAC
Mississippi—Elmer L Hammond
Missouri—Arthur F Schlichting
Minnesota—Gustav Bachman C A ANDERSON
Montana—Leon Richards
Nebraska—R A Lyman
New Hampshire—P J Callaghan, GEORGE A MOUTON
New Jersey—R P Fischels, C W HOLTON ERNEST LITTLE
New York—F C A Schaefer, HUGO H SCHARPER
North Carolina—J G Beard P J SUTTLEMYRE H M BURLAGE
North Dakota—W P Portersfield, WILLIAM SCHRAM E P MARTIN
Ohio—F H Freericks M NILE FORD EDWARD SPEASE
Oklahoma—E E Duncan, R W BEECLE LLOYD HARRIS W D PATTERSON NED MILLIGAN D B R JOHNSON
Oregon—GEORGE HAACK Walter Rhodes
Pennsylvania—Henry Brown C LEONARD O CONNELL F H EBY F P STROUP
Rhode Island—CLARENCE A VARS
South Carolina—W H ZEIGLER E T Motley
South Dakota—E R Series, H J SCHNAIDT
Texas—C C Hartis WALTER D ADAMS
Utah—J H B Murray
Vermont—T J Bradley
Virginia—W F Rudd, E P BERLIN A L I WINNE
Washington—Claire Evans
West Virginia—J Lester Hayman ROY B COOK
Wisconsin—Sylvester H Dretzka, RALPH W CLARK
Wyoming—R C Shultz

THE COUNCIL

S L Hilton, H V Army, H C Christensen, W D Adams, J H Beal, R P Fischelis, George D Beal, E F Kelly, E G Eberle, A G DuMez, Rowland Jones, Jr

FRATERNAL DELEGATES

Brooklyn College of Pharmacy—Robert S Lehman, FRED C A SCHAEFER
Philadelphia College of Pharmacy and Science—E F Cook, F P STROUP

In the absence of Vice Chairman Williams, former Chairman P H Costello was requested to take the chair while Chairman Jones read his address, which was under the by-laws referred to the Committee on Resolutions See pages 708-715, August JOURNAL A PH A Chairman Jones announced the appointment of the following Committees

Committee on Resolutions *Chairman*, R L Swain, Maryland, E R Series, South Dakota, George C Schicks, New Jersey, F E Bibbins, Indiana, Roy B Cook, West Virginia, L L Walton, Pennsylvania, M N Ford, Ohio, A L I Winne Virginia, Walter D Adams, Texas

Committee on Nominations *Chairman*, R C Wilson, Georgia, Frank Nau, Oregon, Herbert Parker, Arkansas, John C Krantz, Jr, Maryland, H C Christensen, Illinois, Arthur D Baker, Colorado, Hugo Schaefer, New York, Frank Mortensen, California, W H Hankins, Florida

Chairman R C Wilson stated that the Committee on Nominations would be glad to have suggestions from any of the members in regard to nominees and will be glad to have them come before the Committee at its first meeting at 3 00 P M, on Wednesday, in the Empire Room of the Multnomah Hotel

Chairman Jones announced as the next order of business the reading of the annual report of the Council by Secretary E F Kelly

ANNUAL REPORT OF THE COUNCIL TO THE HOUSE OF DELEGATES 1934-1935

The Council membership consisted of nine elected members, J H Beal, C E Caspari, C H LaWall H V Army H C Christensen, W D Adams, H A B Dunning, S L Hilton and W Bruce Philip and eight ex officio members, President Fischelis, Vice-Presidents Geo D Beal and Oscar Rennebohm, Secretary Kelly, Treasurer Holton, Editor Eberle, Editor DuMez and Chairman of the House of Delegates, Rowland Jones, Jr

The Council has supervision of the property, funds and publications of the ASSOCIATION and acts for the ASSOCIATION and the House of Delegates in the interim between meetings

The business presented to the Council during the year was unusual in scope and importance It was transacted at a meeting of the Council in Washington at two meetings of its Executive Committee on July 17th and January 5th, and the actions of which were confirmed by the Council and at a meeting of the Council in Portland which began on Saturday, August 3rd, and by mail Twenty one Council Letters covering 68 pages and submitting 110 items of business and 39 motions were sent to the members of the Council All of these Letters have been published in the JOURNAL

The Council organized at a meeting on Friday May 11, 1934 in the Shoreham Hotel Washington, D C, following the last General Session of the ASSOCIATION and elected S L Hilton, *Chairman*, J H Beal *Vice Chairman*, and E F Kelly, *Secretary* E G Eberle was elected *Editor* of the JOURNAL and A G DuMez *Editor* of the YEAR BOOK

Chairman Hilton appointed the Council Committees on Finance, on Property and Funds, on Publications on Standard Program and on the YEAR BOOK, and was authorized to appoint an Executive Committee of the Council should the occasion arise

The Council elected S C Henry a member of the Commission on Proprietary Medicines and W J Husa and Geo D Beal members of the Committee on Pharmaceutical Research for terms of five years in each case

As the president was not prepared to submit his appointments he was authorized to make such appointments as are now provided for, to fill vacancies as they may occur, and to make additional appointments as may be necessary or advisable during the year

As the balance in the Headquarters Building Fund was not sufficient to meet all expenses for the building, landscaping approach furniture and equipment the proper officers of the ASSOCIATION were authorized to borrow \$40 000 00 from the Maryland Trust Company at 4% interest and with Chairman Dunning's endorsement and the loan was paid in full on December 31, 1934, through additional collections

The first meeting of the Executive Committee was held in the AMERICAN INSTITUTE OF PHARMACY on July 17th, with the full membership present—Fischelis, Hilton, Army, Dunning, DuMez Eberle, Holton, Kelly, LaWall and Philip

It was decided that all papers presented before the Sections be submitted in duplicate and the request of the Section on Practical Pharmacy and Dispensing that fifty dollars be added to its budget for use in collecting and correlating propaganda which has been employed to promote professional pharmacy, was approved

As the Reading Room of the AMERICAN INSTITUTE OF PHARMACY had been equipped in honor of the late Franklin M Apple to the extent of the funds bequeathed by him, it was ordered that the Apple Fund, amounting to \$1607 05, be transferred to the Headquarters Building Fund

Chairman Dunning submitted, in detail, the plans for securing a maintenance fund and for possible additions to the building and to its equipment The subject was discussed at length during which details of the future plans of the ASSOCIATION in connection with the AMERICAN INSTITUTE OF PHARMACY were given careful consideration Each member of the Council was requested to submit in written form his ideas for the activities to be undertaken in the INSTITUTE in addition to those already announced

The following subjects were also considered

"Proposed merger of the AMERICAN PHARMACEUTICAL ASSOCIATION and National Association of Retail Druggists as advocated by a number of state pharmaceutical associations, proposed federation of state associations and possible affiliation of such federation with the national associations, proposed consolidation of dues of national and state associations, possibility of organizing certain surveys and other activities in the AMERICAN INSTITUTE OF PHARMACY if funds are provided from outside sources, status of the AMERICAN INSTITUTE OF PHARMACY in relation to the AMERICAN PHARMACEUTICAL ASSOCIATION, proposed plan for a Council of Pharmaceutical Practice as advocated by Professor Cook, study of state codes, study of laws pertaining to the sale of drugs and medicines with the possibility of suggesting a model state law, possibility of enlisting support of the American Bar Association in studies of pharmaceutical legislation, plans for increasing the membership of the ASSOCIATION, better coordination of the programs and activities of sections of the ASSOCIATION and local branches, food and drug legislation, and program for the annual meeting

'It was decided to request the special committee of the Council appointed to study the proposed plan for a Council on Pharmaceutical Practice to arrange for a meeting at an early date for the purpose of discussion and making definite recommendations to the Council "

The invitation of the Executive Committee of the National Association of Retail Druggists to the Council to meet jointly during the N A R D meeting was accepted, and arrangements were made for attendance of members of the Council

In October, A O Mickelsen of Portland, Oregon, was elected *Local Secretary* and later the Multnomah Hotel was selected as the headquarters and the week of August fifth as the time, for the Eighty-Third Annual Meeting

At the annual joint meeting of the Council and the Executive Committee of the N A R D the Council was represented by J H Beal, W D Adams, W Bruce Philip and E F Kelly The agenda of the meeting included the proposed consolidation or federation of the two associations, the proposed federation of the state associations, a more effective plan of cooperation between the two associations, federal food and drug legislation, U S P and N F Publicity, and National Pharmacy Week The decision was to appoint a joint committee to effect a better relation and to cooperate in dealing with the important questions referred to Later, E F Kelly R P Fischelis and R L Swain were approved as the representatives of the AMERICAN PHARMACEUTICAL ASSOCIATION

The contract for printing and binding the YEAR BOOK, Volume 22, was awarded to the Lord Baltimore Press Baltimore, Md, and for printing and mailing the JOURNAL for 1935 to the Mack Printing Company, Easton, Pa

The Special Committee on the Proposed Council on Pharmaceutical Practice held a meeting in Washington on August 18th, and later submitted a report recommending the establishment of a Council on Pharmaceutical Practice to be conducted under the auspices of the A Ph A with certain objectives as outlined and with a membership of nine consisting of the chairmen of the U S P and N F Committees of Revision a representative each from the A A C P and the

N A B P, and a retail, a hospital and a government pharmacist, with the president and secretary of the A P H A as ex officio members. An advisory committee representing twelve organizations in the public health field was also recommended. The recommendations were approved and the special committee continued for the purpose of developing the plan and presenting a more perfected plan at this meeting.

In December, the Committee on Finance submitted an extensive report on receipts and expenditures for 1934 and an estimate of receipts amounting to \$35,800 00 for the calendar year 1935, with a budget of expenses amounting to \$35,580 00 which were approved. The Committee recommended that the policy of strict economy be continued for 1935, especially because of the expenses of revision of the N F and the R B and the inclusion of Pharmaceutical Abstracts for 1935 in the JOURNAL beginning with the March issue.

W Albert Johnson of Baltimore, who has served since 1922, was selected to audit the accounts of the ASSOCIATION for 1934. His report was published in the May issue of the JOURNAL and the Treasurer's report will be published in full later. A summary of his report for 1934 will be included in the Treasurer's report to be given later in this session.

During the year the late Dr Frederick B Kilmer left a bequest of \$3000 00 as a trust fund, the income from which is to be given as a prize for meritorious work in Pharmacognosy, and Dr J H Beal gave \$1000 00 to the Endowment Fund. Special gifts for the AMERICAN INSTITUTE OF PHARMACY will be reported by Chairman Dunning of the Committee on Maintenance.

The second meeting of the Executive Committee of the Council was held on January 5th with all members present. Vice Chairman J H Beal and Former-President R L Swain were present by invitation.

Messrs Fischelis Kelly and Swain as the AMERICAN PHARMACEUTICAL ASSOCIATION representatives on the A P H A N A R D Joint Committee reported on the sessions of the meeting held in Washington on December 5 1934 at which the following unanimous agreements were reached:

1 That the proposal to consolidate the A P H A and the N A R D was disposed of for the present by a formal resolution adopted by the N A R D at its recent meeting in New Orleans.

2 That, although the proposal for some form of affiliation between the two associations did not appear to be practical under the existing conditions and in view of the apparent need for separate organizations to deal with the professional and economic problems of pharmacy an effective plan of cooperation should be worked out.

3 That some practical plan of federating the State Associations with the A P H A and the N A R D more closely than is now the case is necessary.

4 That the Committee favors the further consideration of the suggestion that a plan be worked out for federating the State Associations with both National Associations by providing that members of each State Association become automatically members of the National Associations on a single membership fee plan.

Arrangements were made for a meeting of the Joint Committee early in January preferably on the 8th to further develop the plan to which representatives from the Conference of Pharmaceutical Association Secretaries representing the State Associations, will be invited.

5 With respect to Pharmacy Week.

(a) That the A P H A should take the leadership and should appoint the Committee on Pharmacy Week including several representative members of the N A R D.

(b) That the two Associations should award a joint certificate to the ten best window displays after the first award.

(c) That the annual appropriations of \$250 00 each from the A P H A and N A R D be continued and increased as rapidly as possible.

(d) That as many carefully selected advertisers as possible be requested to give a definite time for Pharmacy Week on the radio and to provide them with a program.

6 That the A P H A should direct U S P and N F Publicity and that it should collect information about the work being done in the various states and work out a standard plan for promoting the use of official preparations.

7 That First Aid Week should be directed by the N A R D and that the A P H A should assist in so far as possible.

The report was received and the representatives were authorized to cooperate in the investigation and consideration of any proposed plan for the federation of state and national associations on a single membership fee or otherwise for submission to the respective associations

The work of the Committee on Maintenance was reported on by Chairman Dunning and carefully considered by the Committee. It was agreed to provide for a special committee on Library and a special committee on Museum to study the development of these divisions of the INSTITUTE and to submit plans with respect to each

The relation of the A P H A to the National Trade Conference was discussed at length but no change in the present status was decided upon nor other action taken

The Committee on Publications submitted an extensive report on the progress of revision of the N F and R B and on the plans for publishing Pharmaceutical Abstracts and other material heretofore appearing in the YEAR BOOK in the JOURNAL. It was decided, (a) to set the retail price of the N F VI at \$5 00 per copy in cloth binding and at \$7 00 in interleaved leather and the price of the Pharmaceutical Recipe Book II at \$5 00 per copy in cloth binding, (b) to approve the selection of Mrs. Elsie Kassner as editor of the Recipe Book, (c) to hold a meeting of certain members of the Committee on Recipe Book to hasten revision, (d) that on account of expense and the small amount of space in the JOURNAL, it was not practical to publish the report outlining proposed changes in the N F VI, (e) to publish the Pharmaceutical Abstracts for 1935 and other YEAR BOOK material in monthly issues of the JOURNAL beginning in March, in forms of 32 or more pages, separately numbered and indexed and (f) that the YEAR BOOK, Volume 22, for 1933, be issued as promptly as possible

Relations of the A P H A with the National Retail Drug Code Authority on which the secretary was the temporary representative and of which he was the secretary-treasurer was considered at length. It was decided that the secretary should be relieved of this additional work as promptly as arrangements could be made now that the work of the Authority was well organized and that he should serve in an advisory capacity. Later Mr. W. S. Elkins, Jr., was elected *Executive Secretary* of the Code Authority and served in that capacity until June 15, 1935, when the Code Authority was discontinued

The meeting of the Executive Committee then adjourned

Oliver A. Farwell of Detroit, Mich., submitted his resignation as a member of the Committee on National Formulary on account of his retirement, and E. Wirth, School of Pharmacy, University of Illinois, Chicago, was elected to serve the unexpired term on the recommendation of Chairman Gathercoal

In May, the General Program of the Portland meeting was submitted by the Committee on Standard Program, through the secretary, and it was later approved

The important changes suggested in the tentative program for the 1935 meeting are

(a) The meeting of the Council heretofore held on Monday has been scheduled for the Saturday preceding. The object is to avoid the conflict with the sessions of the A. A. C. P. and the N. A. B. P. on Monday and to provide time for the uninterrupted consideration of the important business to come before the Council. It is understood that the meeting of the Council will be continued on Sunday if necessary

(b) Provision is made for a Joint Meeting of the Council and the Executive Committee of the N. A. R. D. on Wednesday afternoon, August 7th

(c) Meetings of the Committees on Nominations and on Resolutions are scheduled in order that those who may desire to appear before these Committees will have the opportunity to do so

(d) The Third Session of the House of Delegates is scheduled for Friday afternoon rather than on Friday morning and the short Final Session of the House heretofore held just prior to the Final General Session on Friday evening is omitted since the change above mentioned makes the short session unnecessary. Under the proposed arrangement the sessions of the Sections will be completed by noon on Friday and all resolutions and actions requiring consideration by the House of Delegates can be acted upon at the Friday afternoon session. In addition, time will be available to prepare the final report of the House for consideration at the Final General Session

The contract for printing and binding the Recipe Book II was awarded to the Mack Printing Company, Easton, Pa., which firm had the contracts for the U. S. P. XI and N. F. VI, and of,

ferred to accept that for the Recipe Book on the same price basis as that for the N F VI with necessary increases for the advanced cost of paper, of binding and electrotypes and of printing

The Council was officially advised that the property of the ASSOCIATION in Square 62, Washington D C, had been exempted from taxes by the Commissioners of the District of Columbia as on January 1, 1934, said exemption to continue so long as the property is used for its present purposes

At the second meeting of the Council held in Portland, annual reports were received from the Committees on Finance on Property and Funds, on Publications, on National Formulary, on Recipe Book, on YEAR BOOK and on Standard Program, and from the Commission on Proprietary Medicines These reports covered the activities of the ASSOCIATION during the year with respect to its property funds and publications and they were given careful consideration by the Council in a forenoon, afternoon and evening session The reports and the actions taken on them will appear in full in an early Council Letter to appear in the JOURNAL

The publications of the ASSOCIATION were given special attention The revisions of the National Formulary and Recipe Book are now nearing completion with the expectation that the new editions will be issued later in the year The abstracts of pharmaceutical literature for 1935 are being published in the JOURNAL and with the issuance of Volume 23 either this fall or early in 1936 the YEAR BOOK will be discontinued These changes open the way for the issuance of a popular publication in addition to the JOURNAL, as soon as this is possible

These important developments will be dealt with in the President's Address

Steps were taken toward the publication of the recently completed monograph on Aconite and it is expected that other monographs of interest and value to pharmacy may follow Plans are also under way for the publication of a revision of the Professional Pharmacy, which it is believed will make the publication of greater assistance to the practicing pharmacist The first edition evidently proved to be of value since ten thousand copies of it have been disposed of

The Council nominated D M R Culbreth to the House of Delegates for election as Honorary President for 1935-1936, E F Kelly for Secretary and C W Holton for Treasurer These nominations are being submitted in a separate letter

During the year, 273 members were elected and Dr C A Rojahn of Germany was elected an Honorary Member

E F Kelly R P Fischelis and R L Swain were continued as the representatives of the ASSOCIATION on the A P H A - N A R D Joint Committee

(Signed) E F KELLY, *Secretary*

On motion of F H Freericks the report was received and referred to the Committee on Resolutions seconded by W H Porterfield, carried

Chairman Jones called for the report of the Treasurer as the next order of business This was read by Secretary Kelly It follows

REPORT OF THE TREASURER OF THE AMERICAN PHARMACEUTICAL ASSOCIATION JANUARY 1 TO JUNE 30 1935

<i>Current Funds</i>	Jan 1 1935	June 30 1935
Savings and Checking Accounts	\$ 2,557 40	\$ 2,183 92
Secretary's Account	1,638 61	1,638 61
Total	\$ 4,196 01	\$ 3,822 53
<i>Permanent Funds</i>		
Endowment	\$ 15,764 00	\$ 17,020 73
Centennial	5,926 44	6,013 59
Ebert Legacy	8,604 82	8,760 76
Ebert Prize	1,087 38	1,063 18
Life Membership	35,588 83	33,694 83
Endowed Membership	128 40	128 40

Research	65,953 77	67,030 63
Headquarters Building, Bonds and Cash		15,034 56
Headquarters Building, Property and Equipment	547,453 63	535,796 07
Total	\$680,507 27	\$684 542 75
<i>Trust Funds</i>		
Procter Monument	\$ 17,896 76	\$ 18,213 55
Remington Honor Medal	1,317 39	1,342 01
Total	\$ 19,214 15	\$ 19,555 56
<i>Summary of Funds</i>		
Current	\$ 4,196 01	\$ 3,822 53
Permanent	680,507 27	684,542 75
Assets	684,703 28	688,365 28
Trust	19,214 15	19,555 56
Total	\$703,917 43	\$707,920 84

SCHEDULE OF DEPOSITS, SECURITIES AND PROPERTY

Deposits

Baltimore National Bank	\$ 10,676 07	
Merchants and Newark Trust Co	1,770 24	
Boston Penny Savings Bank	426 68	
Baltimore Trust Co	6,317 22	
Maryland Trust Co	14,834 56	
Total		\$ 34 024 77

Securities

Liberty Bonds 4th issue, 4 $\frac{1}{4}$ %	\$ 17,400 00	
Treasury Bonds, 2 $\frac{7}{8}$ %	18,500 00	
Federal Farm Mortgage Corporation Bonds, 3%	1,000 00	
State of Illinois Bonds, 4%	6,000 00	
State of Massachusetts Bonds 3%	14,000 00	
State of North Carolina Bonds, 4 $\frac{1}{2}$ %	7,000 00	
State of Tennessee Bonds, 4 $\frac{1}{2}$ %	3,000 00	
City of Baltimore Bonds, 4%	40 000 00	
City of Chattanooga Bonds 4 $\frac{1}{2}$ %	8,000 00	
City of Dallas Bonds, 4 $\frac{1}{2}$ %	11,000 00	
City of Detroit Bond, 4%	1,000 00	
City of Newark Bonds, 4%	6,000 00	
City of Patterson Bond, 4 $\frac{1}{4}$ %	1,000 00	
Town of Montclair Bonds 4 $\frac{1}{4}$ %	4,000 00	
Chicago, Milwaukee St Paul & Pacific R R Co Bonds, 5%	200 00	
Total		\$138,100 00

Property

Lots 3, 4, 5, 16, 17, 801, 802 806 807 in Square 62, Washington, D C, Building and Equipment		\$535,796 07
Total		\$707,920 84

Of the securities listed above, only 1-\$1000 bond of the City of Detroit (in Life Membership Fund) has failed to pay interest to the amount of \$40 00 As of October 15, 1934 and April 15 1935, \$20,800 Liberty Loan Bonds, 4¹/₄%, were called and were replaced with Treasury Bonds, 2⁷/₈%, with the exception of \$3000 00 transferred from the Life Membership Fund to the Current Fund and \$100 00 each from the Endowment, Centennial and Research Funds which were converted into cash

The property entry represents the actual cost of the site, the landscaping the Building, the approach and the equipment less the mortgage of \$36 400 00 on Lot 7 which it was necessary to purchase in order to acquire the other property required Approximately \$1750 00 is due on deferred payments

On May 10, 1935, the property of the ASSOCIATION was formally exempted from general taxes by action of the Board of Commissioners of the District of Columbia as of January 1, 1934 the date the property was occupied such exemption to continue so long as the property is used for its present purposes The Chairman of the Committee on Maintenance will give further details in his annual report

On account of the closing of Water Street between 22nd and 23rd Streets and the transfer of property between the United States of America and the ASSOCIATION, in accordance with Public Resolution No 18 signed May 1932 and as set out in Council Letter No 3, 1932-1933 see JOURNAL A PH A Oct 1933 pages 1058 to 1065 it became necessary to renumber certain of the lots in Square 62 as shown on the plot plan printed on page 1063

The parts of Lots 12, 13, 14 15 and 17 transferred to the United States as shown in red on the plan, are now numbered Lot 805 The remainder of these lots is now numbered Lot 806 The property transferred to the ASSOCIATION by the United States as shown in yellow on the plan and comprising part of the bed of Water Street and part of U S Reservation No 332B is numbered Lot 807 The order of exemption therefore, covers all of the property owned by the AMERICAN PHARMACEUTICAL ASSOCIATION

The Secretary's report will show receipts from Dues the JOURNAL, the National Formulary, Recipe Book, YEAR BOOKS, Proceedings Bulletins, Badges and Bars, Buttons and Pins and Miscellaneous Items, which are collected by him and deposited in the Secretary's account in the Baltimore National Bank These receipts are transferred by check, accompanied by itemized deposit slips to the ASSOCIATION's checking account in the Merchants and Newark Trust Company from which all budget expenses are paid by voucher check

The report of the Treasurer for the calendar year 1934 was audited by W Albert Johnson, the auditor approved by the Council and his report was published in the JOURNAL for May 1935 page 426 A summary of the Treasurer's report for 1934 is given in this report and the full report will be published later in the JOURNAL

CHARLES W HOLTON *Treasurer*

On motion duly seconded the report was received

Chairman Jones called for the report of the Secretary as the next order of business It follows

REPORT OF THE SECRETARY

May 1, 1934 to June 30 1935

The last annual meeting was held in May on account of the dedication of the AMERICAN INSTITUTE OF PHARMACY and therefore the ASSOCIATION year covered by this report was an unusually long one A special effort has been made to provide for complete reports by the officers, committees and delegates of the ASSOCIATION at this meeting and to avoid repetition, this report will be limited as far as possible, to matters not covered in other reports and to matters which require additional comment

During the preceding ASSOCIATION year emphasis was placed upon the completion of the building and upon the arrangements for its dedication in so far as the ASSOCIATION officers were concerned During this year major attention has been given to the occupancy of the building, to the completion of the landscaping and planting, to the equipment of the building, to the inventory and insurance of furniture and equipment, to arrangements for the maintenance of the building and grounds, to the preliminary development of the Library and Museum, to the neces

sary re adjustment of the accounting system, and to securing exemption from taxation. This necessary and very important work might be referred to as a consolidation of our position and it is a great satisfaction to state that it is now practically completed. The home which the ASSOCIATION has looked forward to for so many years is now a growing concern which can operate within its income and we are now prepared to proceed with the development and extension of its functions. As previously stated, we have been exceedingly fortunate in the attitude of those government officials interested in our project and in the helpful advice and guidance they have so freely given us. They have strongly advised that we proceed carefully, even slowly, in the future development of the AMERICAN INSTITUTE OF PHARMACY. We now occupy a key position which will, because of its surroundings and because of the plans for the further development of the area, become increasingly valuable and increasingly influential for pharmacy and for the ASSOCIATION. The professional and scientific standing of the ASSOCIATION and of its related organizations had been given added recognition by the government in the exemption of its property from taxation.

The act of Congress legalizing the ownership of the property limits the occupancy of the building and the tax exemption is to be continued so long as the property is used for the present purposes. It is therefore, necessary to keep these limitations clearly in mind in planning the future activities of the ASSOCIATION.

The ASSOCIATION, at the Baltimore meeting, by resolution, decided upon the associations and organizations which were to occupy the building. The government officials have known of and approved this action, at the meeting last year, the National Association Boards of Pharmacy decided to move its headquarters to the building and it is hoped that the American Association of Colleges of Pharmacy will soon take similar action since it is important that the work of the three related organizations shall be coordinated as closely and as promptly as possible. A decision also has an evident relation to the development of additional divisions of the ASSOCIATION. Furthermore, the ASSOCIATION's office is now called upon to do work in which it should have the advice and cooperation of the other associations. Every effort should be made to concentrate in the AMERICAN INSTITUTE OF PHARMACY all of the organizations and agencies interested in professional and scientific pharmacy. Otherwise it will become necessary in the interest of efficiency and progress for the ASSOCIATION to create somewhat parallel divisions to those already in existence.

The publications of the ASSOCIATION have also required unusual attention from the office of the ASSOCIATION during the year. The Committee on Publications, the Committee on National Formulary and the Committee on Recipe Book will report the details and it is sufficient here to mention only the outstanding facts.

The contracts for printing and binding the N F VI and the R B II and the contracts for their distribution and sale have been worked out and awarded. The four contracts have been awarded to the Mack Printing Company of Easton Pa., on the basis of their bids and the same firm has the contracts for the U S P XI. The manufacture and distribution of these three valuable publications are, therefore, concentrated, and as the result the savings effected and the increased return will enable the ASSOCIATION to expand this important phase of its work and to render a greater service to the public as well as to pharmacy.

The office has also been called on to give considerable attention to the completions of the revisions of the N F and R B which will undoubtedly bring greater credit to the ASSOCIATION. The issuance of the revisions sometime before January first will also enable the ASSOCIATION to arrange for the partial concentration of the work of revision in the building, and it is believed with considerable saving in operation.

Volume 22 of the YEAR BOOK covering 1933, has just been issued and it is expected that Volume 23 covering 1934, will be issued in the fall. If so, the YEAR BOOKS will be completed. Beginning with the March issue, the material for 1935 heretofore appearing in the YEAR BOOKS has appeared monthly in the JOURNAL bringing this service up to date, and thereby increasing its value to pharmacy and to our members. This work has meant an extra call on the finances of the ASSOCIATION and marks the completion of the first two steps in its plans for its publications and opens the way for the third step which is to issue a more popular professional publication intended for wider distribution and to bring the services of the ASSOCIATION more directly to the pharmacists of the nation. Plans for the popular publication are already under way.

The question of the continued participation of the ASSOCIATION in the work of the National Retail Drug Code Authority which was to be decided at this meeting, was fortunately, or unfortu-

nately settled by a previous decision Your secretary, as is well known, served as the A PH A representative on the Code Authority and as the secretary-treasurer of that body during its existence During part of the time, he also acted as its executive secretary These duties added greatly to his work and to an extent interfered with his ASSOCIATION work The Code Authority maintained a separate office and provided its own office force and the secretary was given every consideration and assistance possible toward lessening the pressure There was, and very naturally, a question as to wisdom of the active participation of this professional and scientific association in an effort principally intended to relieve the economic and commercial situation of the retail druggist It must be evident, however, that professionally the pharmacist is in a good position while, economically, the druggist is in an unsound if not a precarious position, and that the further improvement and even the maintenance of our professional position is considerably dependent upon whether and in what manner the economic situation can be improved At least the A PH A has made a contribution to the solution of the problem and has demonstrated that while it is principally concerned with professional and scientific pharmacy, it is in no sense indifferent to the economic problems of the pharmacist, and apparently with no damage to its professional standing

The 1934 Meeting—The principal addresses and the proceedings of the Council appeared in the May issue of the JOURNAL, the proceedings of the General Sessions, the House of Delegates, the N A B P and the A A C P in the June issue, and the proceedings of the Sections and Conferences in the July issue The papers and other communications have appeared in succeeding issues Although the proceedings were more voluminous, the JOURNAL gave a complete report within three months after the meeting

The resolutions were furnished promptly to the state and national associations, to boards of pharmacy, to the schools and colleges and to the pharmaceutical publications and compliance with the request that support given to those resolutions of joint interest was more general than heretofore

We are further indebted to the pharmaceutical press for the interest and support given our work during the meetings and throughout the year Greater space is given to professional pharmacy each year and the necessity for its practice is more generally emphasized

It is important, however, that the delegates of each state and national association submit a report on the A PH A meeting at the annual meeting of their respective associations Such reports should be devoted to a general explanation of the work of the ASSOCIATION and the accomplishments of the annual meeting

The 1935 Meeting—It has been difficult to carry on arrangements for the annual meeting at such a distance and in a section in which the ASSOCIATION has not visited Local Secretary Mickelsen, Chairman Haack and their associates deserve great credit from their visitors for the time and thought and effort they have so cheerfully and effectively contributed

We are also indebted to the officers and members of the Pharmaceutical Associations of Oregon, Washington and Idaho for their interest in our meeting and their cooperation in arranging for the Tri State Meeting in Portland during this week This is an innovation and one which should have consideration in arranging for our meetings in other sections, especially those at a distance We are also indebted to the pharmacists in other neighboring states who have visited us in such numbers and have cooperated toward the success of this meeting

Mention is due to the individuals, firms and associations who have contributed in one way or another to the success of this occasion The Local Committee has or will pay credit to them by name

The General Program—The Committee on General Program will report on the changes which have been made for this meeting The principal changes are the meeting of the Council beginning on Saturday and the elimination of the short session of the House of Delegates before the final General Session

Otherwise, the program is in general as heretofore We have suggestions for additional sections from hospital pharmacists, government pharmacists and employee pharmacists which indicates an increased interest on the part of these groups Our program is now so full, however, that the needs of special groups will probably have to be taken care of through the creation, if necessary, of sub sections of those sections now operating rather than by new sections

Pharmacy and the Government—A further step in the recognition of pharmacy by the Na

tional Government during the year has been the transfer of the pharmacists from the sub professional to Grade One of the Professional and Scientific Service in the Veterans Administration. Because of the economy orders, the transfer does not give all of these pharmacists the advantage of the salary of this grade but the salary will be available later when the order is withdrawn. Arrangements are being made to work with a committee of pharmacists from this service toward broadening the service which pharmacy can render as their further promotion in grade will depend to some extent on a broadened service.

As the Committee on Pharmacy Corps will report, several conferences have been held with the Surgeon General of the Army and the question at issue now has narrowed itself to whether pharmacists shall be commissioned in the Medical Auxiliary Corps or in a separate Pharmacy Corps, which represents great progress from the time when the question of commissioning pharmacists seemed doubtful.

Three bills were voluntarily introduced in Congress by Representatives McSwain, Evans and Johnson providing for commissioned rank for pharmacists in the Army and Navy which is a further recognition of the changed attitude on this question and on the necessity to improve the pharmaceutical service in these two services.

On the other hand, government officials and representatives are calling on the A P H A for service more frequently and the INSTITUTE OF PHARMACY is becoming recognized as the source of information on all matters relating to pharmacy.

Such service and information as we can furnish will emphasize the value of pharmacy and in several instances we have been requested to furnish briefs and papers showing the work which pharmacy does and its value as a public health profession.

American Association for the Advancement of Science—The A P H A has been affiliated with this ASSOCIATION and with its Section N—Medical Sciences—since 1926 and has been represented in its Council by one Councilor. Because of the increase in members of the A P H A who have joined the A A A S, the A P H A has this year become entitled to two Councilors, which increase places pharmacy on an equal basis with the other public health professions. Dr. John C. Krantz, Jr., has served as Councilor for several years and Professor Gustave Bachman was appointed this year.

Early this year arrangements were completed to divide Section N into three sub sections to be known as 1 N—Medicine, 2 N—Dentistry and 3 N—Pharmacy, and that at the meetings each subsection should hold a meeting in addition to the meetings of the whole section. The meeting of 3 N—Pharmacy at the recent Minneapolis meeting was a gratifying success in attendance and in the character of the program.

The position which pharmacy now holds in this most representative scientific association through the A P H A provides further recognition of its professional standing and also a splendid opportunity to illustrate the contributions that pharmacy makes to the advancement of science in this country.

The State and National Pharmaceutical Association—The relations of the A P H A with these organizations grow closer and more coöperative each year. Although it has not been possible for an officer to attend each meeting of the state and national associations, the A P H A has been officially represented at most of them.

The A P H A office is called on more and more frequently for some service by the state and national associations and it is very encouraging to have the calls increase. As the reference library and other divisions in the building develop, we hope to be of greater service.

Local and Student Branches—Although no new branches have been established during the year, most of those listed have carried on successfully during the year and have materially assisted the ASSOCIATION in its work. Inquiries about student branches have recently been received from three schools and it is hoped that with the improvement in conditions, branches will soon be established in every school and college.

Membership—As previously reported the ASSOCIATION has during the depression and at their request, carried a number of members who could not pay dues promptly. A considerable proportion of those in arrears were able to pay during the year either wholly or partially. Those who found it impossible to pay have been removed from the roll and we are now almost back on the old basis. This has resulted in the removal of 612 names during the year. In addition, 42 members have died and 21 have resigned.

During the year, two hundred and sixty four members have been elected, 154 during the present calendar year

The membership at present is approximately 3200 of whom 181 are Life Members and 24 Honorary Members The report of the Committee on Membership will outline the plans for increasing the membership in the near future

Receipts of the Secretary's Office and the Sales of the N F and R B—Attached are financial statements of the receipts from January 1 to June 30, 1935, from Dues, Bulletins, Proceedings YEAR BOOKS, Badges and Bars, Buttons and Pins, and Miscellaneous Items Remittances to the Treasurer and the balance on hand are also set out

The attached reports also give detailed information in reference to the printing binding and sale of the National Formulary and the Pharmaceutical Recipe Book

The Secretary's annual financial report for the calendar year 1934 was submitted with that of the Treasurer, and audited as provided for in the By Laws

SUMMARY OF RECEIPTS AND REMITTANCES, SECRETARY'S OFFICE, JANUARY 1 TO JUNE 30, 1935

Receipts by Secretary

Balance on deposit January 1 1935		\$ 1,638 61
Dues		
Membership only	\$ 116 00	
Membership and JOURNAL, 1932	20 00	
Membership and JOURNAL 1933	47 00	
Membership and JOURNAL 1934	423 00	
Membership and JOURNAL 1935	4918 88	
Membership and JOURNAL 1936	60 00	
Membership and JOURNAL, 1937	5 00	
	<hr/>	
	\$5589 88	
JOURNAL	4230 04	
National Formulary	1000 06	
Recipe Book	339 16	
YEAR BOOKS	2021 53	
U S P N F Prescription Ingredient Survey	13 75	
Leaflet No 14	11 00	
American Conference on Hospital Service (Return of Dues)	100 00	
	<hr/>	
Total Receipts		13 305 42
Total Balance and Receipts		<hr/> \$14 944 03

Remittances to Treasurer

Jan 26 1935, Check No 168	\$2021 45	
Feb 2, 1935, Check No 169	2275 73	
March 7, 1935, Check No 170	1916 32	
March 16, 1935, Check No 171	1195 06	
March 30 1935, Check No 172	1247 87	
Apr 25, 1935, Check No 173	1100 24	
May 15, 1935 Check No 174	622 35	
June 3, 1935, Check No 175	1231 99	
June 21, 1935, Check No 176	770 76	
June 29, 1935 Check No 177	923 65	
	<hr/>	
		13,305 42
Balance on Deposit		<hr/> \$ 1,638 61

RECEIPTS AND DISBURSEMENTS ON ACCOUNT NATIONAL FORMULARY, JANUARY 1 TO DECEMBER 31, 1934

Receipts

Sales for quarter ending March 1, 1934, N F V	\$1327 20
Sales for quarter ending June 1, 1934, N F V	538 12
Sales for quarter ending September 1, 1934, N F V	801 60
Sales for quarter ending December 1, 1934, N F V	1975 09
Sales for year, N F I and III	4 85
Sales for year, Bulletins N F VI	55 50
Sales for year, Notes on N F	17 00
Use of Text	10 00

Total Receipts

\$ 4,729 36

Disbursements

N F V

L A Engel Press, Printing	\$ 3 50
Mack Printing Co, Printing and Binding	571 25
N F Display, Exhibits at A M A Meeting	100 00

N F VI

E N Gathercoal, General and Traveling Expenses	626 62
Mrs L E Barnett, Clerical Services	22 40
Miss Edith Smith, Clerical Services	511 60
Humston Keeling Co Supplies	19 57
Samuelson Duplicating Co, Bulletins, etc	879 62
Glenn L Jenkins, Committee Expense	210 20
H A Langenhan, Committee Expense	11 95
Adley B, Nichols, Committee Expense	20 33
H B Gilpin Co, Supplies	6 43
Pulcher-Hamilton Daily Co, Binders, etc	127 75
Md Pharm Assoc, Reprints	13 55
Gaw O'Hara Envelope Co, Envelopes	73 53
JOURNAL, A Ph A, Reprints	2 66
Mack Printing Co	87 43
Nat'l Confer Pharm Research, Membership	25 00
E P Douglas, Printing	38 42
K M Wright Studios, Picture of Display	3 60
Ray Adamson, Research	33 75
R E Terry, Expenses N F Exhibit at St Paul	12 55

Total Disbursements

\$ 3 401 71

RECEIPTS AND DISBURSEMENTS ON ACCOUNT NATIONAL FORMULARY, JANUARY 1 TO JUNE 30, 1935

Receipts

Sales quarter ending March 1 1935, N F V	\$ 834 86
Sales quarter ending June 1 1935 N F V	110 40
Sales of Notes N F VI	9 80
Sales of Bulletins, N F VI	45 00

Total Receipts

\$ 1,000 06

Disbursements

N F V

Mack Printing Co	\$1053 54
------------------	-----------

N F VI

E N Gathercoal, General and Traveling Expenses	427 28
Samuelson Duplicating Co , Bulletins etc	409 15
Pilcher-Hamilton-Daily Co , Binders and Paper	63 75
S L Hilton, Expenses	1 55
E P Douglas, Printing	18 36
Miss Edith Smith, Clerical Services	450 00
Miss Florence I Otis, English Correction	200 00
Adley B Nichols, Traveling Expenses	37 27
Mack Printing Co	72 43
Pioneer Publishing Co Printing	16 73

Total Disbursements

\$ 2,750 06

SUMMARY OF RECEIPTS AND DISBURSEMENTS ON ACCOUNT OF N F JANUARY 1, 1926 TO JUNE 30 1935

	<i>Receipts</i>	<i>Disbursements</i>
1926	\$ 45 318 21	\$20 958 56
1927	17,460 75	8,389 38
1928	14,565 15	3,560 41
1929	12 718 40	3 556 60
1930	9,940 05	6 123 32
1931	8,271 00	3,702 38
1932	4,243 27	2,087 20
1933	3,957 36	4 231 01
1934	4,729 36	3,401 77
1935 (to June 30)	1,000 06	2,750 06
Totals	\$122 203 61	\$58 760 69

SUMMARY OF SALES OF N F V—JANUARY 1 TO DECEMBER 31, 1934

Quarter Ending	Binding	Copies	Price	Amount	Rec d by Secretary
Mar 1, 1934	Buckram	553	\$2 40	\$1327 20	
	Leather	0			\$1327 20
June 1, 1934	Buckram	225	\$2 40	\$ 540 00	
	Leather	1	4 80	4 80	
	Less freight and postage			6 68	\$ 538 12
Sept 1, 1934	Buckram	334	\$2 40	\$ 801 60	
	Leather	0			\$ 801 60
Dec 1, 1934	Buckram	832	\$2 40	\$1996 80	
	Leather	0			
	Less freight and postage			21 71	\$1975 09
Total Sales for 1934					\$4642 01

SUMMARY OF SALES OF N F V—JANUARY 1 TO JUNE 30, 1935

Quarter Ending	Binding	Copies	Price	Amount	Rec d by Secretary
Mar 1, 1935	Buckram	352	\$2 40	\$ 844 80	
	Leather	0			
	Less drayage			9 94	\$ 834 86
June 1, 1935	Buckram	42	\$2 40	\$ 100 80	
	Leather	2	\$4 80	9 60	\$ 110 40
Total Sales for 1935					\$ 945 26

SUMMARY OF COPIES OF N F V PRINTED AND BOUND TO JUNE 30, 1935

Series	Buckram	Leather	Total
A	19,561	500	20,061
B	10 023		10,023
C	5,000		5,000
D	5,000		5,000
E	5,000		5,000
F	4 479		4,479
G	1,488		1,488
	50,551	500	51,051

SUMMARY OF COPIES OF N F V—DISTRIBUTED COMPLIMENTARY, SOLD AND HELD IN STOCK BY J B LIPPINCOTT Co, TO JUNE 30 1935

	Buckram	Leather	Total
Copies used in copyrighting and for complimentary distribution through the Mack Printing Co	33	12	45
Copies distributed complimentary through the Chemical Catalog Co	32		32
Copies sold by the Chemical Catalog Co *	18 021	70	18 091
Copies distributed complimentary through J B Lippincott Co	23		23
Copies sold by J B Lippincott Co	31,979	33	32,012
Copies held in stock by J B Lippincott Co	463	385	848
	50,551	500	51,051

SUMMARY OF RECEIPTS AND DISBURSEMENTS PHARMACEUTICAL RECIPE BOOK

	Receipts	Disbursements
1917		\$ 10 50
1918		19 26
1919		
1920		1 40
1921		23 98
1922		42 93
1923		
1924		470 70
1925		572 47

* The Chemical Catalog Co sold 107 copies Leather of which 37 copies were returned by dealers to J B Lippincott Co during quarter ending June 1, 1933

1926		336 38
1927		95 08
1928		766 66
1929	\$ 5,256 00	9,838 65
1930	1,920 98	51 00
1931	3,641 80	61 96
1932	1,356 64	
1933	894 94	130 51
1934	1 428 28	690 89
1935 (to June 30)	339 16	384 10
Total	\$14,837 80	\$13 496 47

SUMMARY OF SALES OF RECIPE BOOK—JANUARY 1 TO DECEMBER 31 1934

Quarter Ending	Binding	Copies	Price	Amount	Rec d by Secretary
March 1, 1934	Buckram	94	\$2 78	\$261 32	
	Less postage			22	\$ 261 10
June 1, 1934	Buckram	259	\$2 78	\$720 02	\$ 720 02
Sept 1, 1934	Buckram	82	\$2 78	\$227 96	
	Less postage			26	\$ 227 70
Dec 1, 1934	Buckram	79	\$2 78	\$219 62	
	Less postage			16	\$ 219 46
Total					\$1428 28

SUMMARY OF SALES OF RECIPE BOOK—JANUARY 1 TO JUNE 30, 1935

Quarter Ending	Binding	Copies	Price	Amount	Rec d by Secretary
March 1, 1935	Buckram	65	\$2 78	\$180 70	\$180 70
June 1, 1935	Buckram	57	\$2 78	\$158 46	\$158 46
Total					\$339 16

SUMMARY OF COPIES OF RECIPE BOOK PRINTED AND BOUND TO JUNE 30, 1935

	Buckram	
Series A	5000	
Series B	506	5506

SUMMARY OF COPIES OF RECIPE BOOK DISTRIBUTED COMPLIMENTARY, SOLD AND HELD IN STOCK BY J B LIPPINCOTT Co TO JUNE 30 1935

Copies distributed complimentary	101	
Copies sold	5345	
Copies held in stock	60	5506

ACCOUNT OF YEAR BOOKS PROCEEDINGS, BULLETINS

	Sales	Expenses
1934	\$ 74 18	\$1487 40
1935 (to June 30)	2021 53	2128 44
Total	\$2095 71	\$3615 84

E F KELLY, *Secretary*

On motion of William Gray, seconded by F H Freericks, the report was accepted
Chairman Jones announced that items 10, 11 and 12 of the program would be deferred until the Second Session of the House of Delegates
The First Session of the House of Delegates was then adjourned

SECOND SESSION

The Second Session of the House of Delegates was held Wednesday, August 7, at 8 00 P M
The meeting was called to order by Chairman Rowland Jones The roll call of delegates was omitted as there were more delegates present than required for a quorum

Secretary Jones called for reading of the minutes of the First Session of the House of Delegates This is not repeated as the transactions are printed in this issue of the JOURNAL On motion of J G Beard, seconded by J Lester Hayman, the minutes were adopted

The report on the International Pharmaceutical Federation was read by E G Eberle and approved

INTERNATIONAL PHARMACEUTICAL FEDERATION

Reference has been made to the program of the International Pharmaceutical Federation in the Report of the Historian The program of the meeting which was held in Brussels, July 29th and 30th, is published in the July number of the *Bulletin of the Federation*

A session of the Commission on Specialties was held in Bern, August 1934 The meeting was opened by President Dr L Van Itallie, who is an honorary member of our ASSOCIATION Among the subjects discussed were various determinations and analyses and a resolution was adopted that steps should be taken to secure information from all countries represented in the Federation relative to methods employed and also from various laboratories and establish a central bureau for utilizing the information

Another informative report published in the *Bulletin* compared certain regulations of different countries governing the practice of pharmacy, the questionnaires included the requirements for practice, preparations that require prescriptions and who is responsible for the regulation of the pharmacy and supervising the practice

Responses were secured from Australia, Belgium, Czechoslovakia, Egypt, France Great Britain, Hungary, Poland Sweden and United States

Another contribution published in the *Bulletin* was made by Colonel Dr J Thomann, of Berne and related to the Congress of Military Medicine and Pharmacy The report dealt with the activities of the service References were made in the report of the Historian and comments have appeared in the JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

The Twelfth International Congress of Pharmacy (July 30 to August 6, 1935) was organized under the auspices of the International Pharmaceutical Federation, the Belgian National Pharmaceutical Society and the Society of Pharmacy of Antwerp

The annual report of Secretary T Potjewijd is published in the July *Bulletin of the Federation*, also the regulations of the International Congress of Pharmacy —E G EBERLE, Reporter

The report of the Council to the American Association for the Advancement of Science from the A PH A was read by Councilor J C Krantz, Jr

REPORT OF THE COUNCILOR TO THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE FROM THE AMERICAN PHARMACEUTICAL ASSOCIATION

Section N, Medical Sciences, N2, Pharmacy

This section was called to order by Dean Wulling of the School of Pharmacy, University of Minnesota at 10 00 A M, June 27, 1935, in the Medical Sciences Building of the University of Minnesota Doctor Wulling outlined in a general way the scope and purpose of the section and introduced the chairman, John C Krantz, Jr, Councilor to the ASSOCIATION from the AMERICAN PHARMACEUTICAL ASSOCIATION

One of the most interesting studies presented was the 'Penetration of Antiseptics in Living Tissues' by Arthur D Hirschfelder He showed by methods of vital staining that many of the commonly employed antiseptics do not penetrate living tissue without producing injury during the course of absorption Of special interest was the paper presented by Harold N Wright on the colloidal properties of the arspenamines In general, it was shown that the colloidal nature of

the arsphenamine compounds increased their toxicity and diminished their therapeutic efficiency Earl B Fischer presented interesting studies on the deterioration of tincture of digitalis and showed how the modern methods of micro-sugar determinations might be used to study the deterioration of the tincture of digitalis as evidenced by the hydrolysis of the glucosides Heber W Youngken presented a most thorough microscopical study of the methods of staining and identification of the endocrine powders used in the treatment of disease In addition, there were interesting papers presented by A H Uhl on *Cracca Virginiana* and Gustav Bachman on Boric Acid, Joseph B Burt on Mercuriated Derivatives of Thymol and Carvacrol and a paper by John C Krantz, Jr, on the fate of the sugar alcohols in the animal body

The following titles represent the papers presented "Studies on the Penetration of Antiseptics in Living Tissues" Arthur D Hirschfelder and Milan Novak, Department of Pharmacology, School of Medicine, University of Minnesota "A Study of *Cracca Virginiana* L," Lawrence F Madland and Arthur D Uhl Department of Pharmaceutical Chemistry, University of Wisconsin "Colloidal Properties of the Arsphenamines in Relation to Toxicity and Therapeutic Efficiency" Harold N Wright, Department of Pharmacology, School of Medicine University of Minnesota "The Fate of the Sugar Alcohols and Their Anhydrides in the Animal Body," John C Krantz, Jr, C Jelleff Carr and Ruth C Musser, Department of Pharmacology, School of Medicine, University of Maryland "The Application of the Shaffer Smoggy Method in the Study of the Deterioration Rate of Tincture of Digitalis and a Physical and Pharmacological Investigation of the Absorption of Glucosidal Complexes Present in Tincture of Digitalis," Earl B Fischer, R A Gortner and Charles H Rogers Department of Pharmacy and Biochemistry, University of Minnesota "The Microscopy of Powdered Desiccated Endocrine Glands," Heber Youngken, Department of Pharmacognosy, Massachusetts College of Pharmacy "A Physicochemical and Pharmaceutical Contribution to the Solubility of Boric Acid in Water," George Crossen and Gustav Bachman, Department of Dispensing, College of Pharmacy, University of Minnesota "The Effect of Certain Sugar Alcohols and Their Anhydrides in the Dissociation Constant of Boric Acid" Margaret Oakley, C Jelleff Carr and John C Krantz, Jr Bureau of Chemistry State of Maryland Department of Health, and Department of Pharmacology, School of Medicine, University of Maryland "Some Mercuriated Derivatives of Thymol and Carvacrol" Joseph B Burt University of Nebraska

The meeting was well attended by local pharmacists, members of the staffs of Pharmacy, Pharmacology and Chemistry of the University of Minnesota Most of the papers presented were discussed at length by those present

The first definite effort of the AMERICAN PHARMACEUTICAL ASSOCIATION to participate in the meetings of the American Association for the Advancement of Science was made by the councilor at the Boston meeting in the winter of 1933 This program was presented in conjunction with Dentistry Owing to extremely inclement weather and a lack of appreciation and mutual understanding between the two professions, the section was not very successful We had not yet found our place in the American Association for the Advancement of Science Through conferences with Dr Henry B Ward, permanent secretary of the organization, and Doctor McKinley of Georgetown Medical School a definite effort was made to establish a permanent section under N, Medical Sciences N3 Pharmacy This has been accomplished In doing this pharmacy has accomplished

1 A definite and permanent place among the medical sciences in the American Association for the Advancement of Science

2 This year's section was as well attended as any of the longer established medical sections

3 Pharmacy had to make no apology for the scientific character of its program

4 The councilor recommends the continuance of participation in the American Association for the Advancement of Science programs biennially, and urges the schools in the vicinity of the meeting to support the program with papers Above all the councilor urges that under no circumstances should the ASSOCIATION compromise with the scientific nature of the program by attempting to make it an applied pharmaceutical presentation

Respectfully submitted,

JOHN C KRANTZ, JR, Councilor to the American Association for the Advancement of Science from
THE AMERICAN PHARMACEUTICAL ASSOCIATION

On motion, duly seconded, it was accepted —Motion by T J Bradley and seconded (See Committee on Resolutions, pages 712 and 714)

Resolutions were presented by the Section on Historical Pharmacy (See Committee on Resolutions, page 712)

Resolutions were presented from R L Irizarry, of the Porto Rico Pharmaceutical Association

A preliminary report was presented by R P Fischelis from the National Drug Trade Conference

Report was presented from Indiana Pharmaceutical Association by B V McCullough and referred to Committee on Resolutions (See Committee on Resolutions, pages 712 to 713)

Report was presented by Chairman A Zieffe for the Committee on Student Branches and referred to Committee on Resolutions (See Committee on Resolutions page 711)

The report of the Committee on Cosmetics was received and referred to the Committee on Resolutions (See also page 710, Recommendation 16)

The report of the Committee on National Pharmaceutical Syllabus was presented by Chairman J G Beard It was received and after some discussion by E R Serles referred for publication

REPORT OF THE NATIONAL PHARMACEUTICAL SYLLABUS COMMITTEE

Your Chairman is unable to report any concrete progress made by him, during the year ending August first There have been no meetings of the Committee because there has been no need for such meetings Since the present edition of the Syllabus is only a bit more than three years old, the work at this time must necessarily consist of studies made of educational changes, with a view to incorporating the essence of such changes in the next revision

Your Chairman agrees with the recommendation adopted by the American Association of Colleges of Pharmacy at the Portland meeting that the next edition of the Syllabus not be issued until after the new Pharmacopœia has been made official and due time has been allowed for consideration of them and that thereafter the revision be semi-annually

During the past year, seventy three copies of the Syllabus were sold as compared with forty-one copies during the previous year However, twelve copies have been distributed, without cost to foreign organizations who have requested them for study Incidentally, from these foreign bodies have come some comments which were of a complimentary nature

The financial report which follows covers the period from May first, 1934 to August first 1935

RECEIPTS

Cash Balance May 1, 1934	\$207 43
Contributions	
A A C P	\$50 00
N A B P	50 00
A Pr A	50 00
Sales of 75 copies of Syllabus	160 75
	<hr/>
	\$518 20

DISBURSEMENTS

Postage	\$32 00
Stationery	7 50
Secretarial assistance	20 00
	<hr/>
Total	\$59 50

Balance on hand	\$458 70
-----------------	----------

J G BEARD, *Chairman*

The report of the Committee on Horticultural Nomenclature was presented by Chairman Heber W Youngken and referred to Council

The report of the Committee on Weights and Measures was presented by Chairman P H Costello It was received (See page 711)

The report of Chairman James E Hancock of the Committee on William Procter Memorial Fund was received and referred to the Committee on Resolutions (See page 714)

Chairman A G DuMez of the Committee on Pharmaceutical Nomenclature reported progress

The report of the Committee on Pharmacy Week was read by Secretary E F Kelly and referred to Council on motion of R P Fischelis and H V Army (See page 714)

Secretary E F Kelly read a communication from Dr Henry B Ward, Permanent Secretary of the American Association for the Advancement of Sciences It was referred to the Committee on Resolutions—see pages 712 and 714

The report of the Committee on Legislation was called for Secretary E F Kelly stated that he had received no report from Chairman Ambrose Hunsberger

COUNCIL REPORT

Secretary E F Kelly read a communication from the Council presenting nominations for Honorary President Honorary Member, Secretary and Treasurer

On motion, duly seconded, the communication was received whereupon the names of the nominations were presented and the nominees were elected by unanimous ballot

Honorary President, D M R Culbreth Baltimore Md, *Honorary Member*, C A Rojahn Halle, Germany, *Secretary* E F Kelly Washington D C *Treasurer*, Charles W Holton, Essex Fells N J

The report of the Committee on Nominations was presented by Chairman R C Wilson For *President*, George D Beal, Pennsylvania John Culley, California, Andrew G DuMez Maryland *First Vice President* William J Husa, Florida, J Leon Lascoff, New York Heber W Youngken, Massachusetts *Second Vice President*, A O Mickelsen, Oregon, E R Serles South Dakota, Edward Spease Ohio For *Council*, Walter D Adams, Texas, F E Bibbins, Indiana, W Mac Childs, Kansas, H C Christensen Illinois, C J Clayton, Colorado, C H Evans, Georgia, R P Fischelis New Jersey, Ernest Little, New Jersey, A L I Winne, Virginia

The report was signed by Arthur D Baker, Frank Nau, H C Christensen Hugo H Schaefer, W M Hankins, John C Krantz, Jr, R C Wilson *Chairman*

A G DuMez requested that his name be withdrawn as nominee for *President* and Edward Spease the withdrawal of his name as nominee for *Second Vice-President*

Chairman Jones said that there were two ways open for filling the vacancies—to accept nominations from the floor or to refer the report back to the Committee on Nominations On vote it was decided to refer the report back to the Committee and it was so ordered

The Committee on Nominations also presented nominations for officers of the House of Delegates Roy B Cook, of West Virginia for *Chairman*, and C Thurston Gilbert, of Connecticut for *Vice Chairman* There being no further nominations from the floor, the nominees were duly elected

The Committee on Nominations retired

Chairman Theodore J Bradley presented the report of the *Committee on Transportation*, which on motion duly seconded was accepted He then presented the report of the Committee on *Place of Meeting* The Committee's report recommended that the Association meet in Dallas, Texas, in 1936, the meeting to be held if possible during one of the last two weeks in August

Motion was made by F H Freericks seconded by F C A Schaefer that the report be accepted, it was so voted

Walter D Adams and H F Hein expressed appreciation for the vote favoring Dallas Texas, and assured a welcome to the members and that everything possible would be done to bring about a successful meeting It was also suggested that a post convention tour might be arranged to Mexico City

Chairman Jones called for a supplemental report of the Committee on Nominations The name of E Fullerton Cook was presented as the nominee for *President* to fill the vacancy and that of James C Munch for *Second Vice-President*

A motion was made by Theodore J Bradley seconded by F C A Schaefer that the report be accepted On vote the nominees were unanimously accepted

The report of the Committee on the Study of Pharmacy (Program item No 6) was called for—Chairman Fischelis stated that he would present the report on Friday

The Second Session of the House of Delegates was then adjourned

THIRD SESSION

The Third Session of the House of Delegates was convened by Chairman Rowland Jones, Jr, Friday August 9, at 2 15 P M Roll Call was omitted the minutes of the Second Session were

read and approved on motion of Charles J Clayton, a second, and vote (The minutes of the Second Session precede)

The report of the delegate to the National Drug Trade Conference, R P Fischelis, was received

The report of the Committee on the Study of Pharmacy, R P Fischelis *Chairman*, was received

President R P Fischelis called attention to several resolutions introduced at the Conference of Pharmaceutical Law Enforcement Officials

Resolution I "Restricting the sale of drugs and medicines by stores where there is no registered pharmacist "

Resolution II "Licensing all manufacturers of drugs and medicines, requiring some standard "

Resolution III Relating to Patent Medicines

Resolution IV "That members of the Conference cooperate with the various branches of the medical profession—physicians, pharmacists and nurses—in matters having to do with economic conditions as they affect these three professions "

Resolution V "Setting forth that the Conference believes that more extensive use should be made of the knowledge possessed by pharmacists " There was no discussion

Chairman Jones introduced Mrs Edna Gleason, of California, who made several presentations Mrs Gleason brought a message of appreciation from the Chinese Pharmaceutical Association of California She stated that the ASSOCIATION cooperated with the druggists of California 100 per cent and they had asked her to bring a greeting from them to the AMERICAN PHARMACEUTICAL ASSOCIATION It was her intention to present one of the gifts (Chinese vases) to President Fischelis and the other to the incoming president, P H Costello President Fischelis expressed his thanks Mrs Gleason then presented Mr Costello with a "Goddess of Good Luck," she was certain that he would need it, he expressed his thanks

Chairman Jones said that the House of Delegates appreciates the message from the Chinese Pharmaceutical Association of California

The report of the Committee on Prerequisite Legislation was presented by Chairman C B Jordan, on motion, duly seconded, the report was accepted for publication, it follows

REPORT OF THE JOINT COMMITTEE OF THE A P H A, N A B P AND A A C P ON PREREQUISITE LEGISLATION

The members of your Committee have endeavored to contact all states in which prerequisite legislation was considered The members of the Committee were assigned the duty of contact as follows Dean H Evert Kendig was assigned a report of the District of Columbia Bill, Carl G A Harring a report of the activity in Massachusetts, and Dean William B Day was assigned the task of securing information from Vermont regarding prerequisite legislation Your chairman assumed the responsibility for the other states in which there was prerequisite activity The report is as follows

Massachusetts —Mr Harring reports that a prerequisite law was introduced in the Massachusetts Legislature but was killed in Committee by the usual plea that it would "prevent the poor boy from having an opportunity " Mr Harring, however, indicates that there will be a different attack next year and expresses hope for success

Michigan —Director E J Parr, of Drugs and Drug Stores in Michigan, reports that House Bill 500 was passed and signed by the Governor This Bill requires that "on and after January 1, 1938, every applicant for such a certificate shall furnish satisfactory evidence that he graduated from an accredited school or college of pharmacy " Heretofore Michigan has had a law requiring only two years of college attendance It is, of course, anticipated that the Board of Pharmacy will recognize no course in pharmacy of less than four years So, beginning with January 1, 1938, Michigan will join the states that have full prerequisite laws

Iowa —Dean W J Teeters, of the College of Pharmacy of the University of Iowa, reports that the Iowa law was amended so that on and after July 4, 1936, every applicant must be a graduate of a school or college of pharmacy recognized and approved by the Board of Pharmacy Examiners, and further that no college of pharmacy shall be approved by the Board of Pharmacy Examiners as a college of recognized standing unless the entrance and graduation requirements are

equivalent to those prescribed by the American Association of Colleges of Pharmacy So, Iowa has joined the group of states of full four-year college prerequisite requirement

Vermont—Secretary W B Eastman of the Vermont State Pharmaceutical Association writes Dean Day as follows

"I am sorry to have to inform you that we have no prerequisite law A bill was introduced two years ago, but was killed In a state like ours where the Legislature is made up very largely of farmers it is very hard to get any legislation passed that is of benefit to the druggists"

Tennessee—Secretary J B Sand, of the Tennessee Board of Pharmacy, reports to me as follows

"A prerequisite bill was introduced by the Tennessee Pharmaceutical Association in the recent session of the Tennessee Legislature but never got past the steering committee"

Arizona, New Hampshire and New Mexico—Secretary Christensen of the N A B P reports that these states have recently enacted legislation requiring graduation from a recognized college of pharmacy as a prerequisite to taking the examination for registration as a pharmacist He also reports that the District of Columbia and Porto Rico have prerequisite laws Missouri is requiring, by board ruling, some college training of applicants for pharmacy license

Your Committee is delighted to report the progress of prerequisite legislation in Arizona District of Columbia Iowa Michigan New Hampshire New Mexico and Porto Rico This leaves the states of Massachusetts Vermont, Tennessee and Nevada, and the territory of Alaska as the only commonwealths without prerequisite legislation

C B JORDAN, *Chairman*

The report of the Committee on Pharmacy Corps in U S Army was read by Chairman E H Kendig The report was on motion duly seconded accepted for publication, it follows

REPORT OF THE COMMITTEE ON THE ESTABLISHMENT OF A PHARMACEUTICAL CORPS IN THE UNITED STATES ARMY, 1935

Your committee was instructed by Resolution No 17, adopted by the ASSOCIATION in Washington last year to secure the establishment of pharmacy properly in the United States Army, and our efforts have been directed to the objective While we cannot report consummation of your desires, we believe the year's efforts have brought us much closer to achievement than heretofore In fact if the ASSOCIATION is willing to accept for the present in lieu of the separate pharmacy corps the proposal of the Surgeon General to commission a fair number of pharmacists in the proposed Medical Auxiliary Corps it is highly probable that during the coming year pharmacy will receive the recognition for which it has so long and earnestly striven

Your Committee has worked in cooperation with the committees of the American Association of Colleges of Pharmacy and National Association of Boards of Pharmacy and has had the very valuable assistance of President Fischelis and Secretary Kelly

In behalf of the committee, whose members are widely separated geographically, President Fischelis and Secretary Kelly had a conference in Washington on February 18th with Surgeon General Patterson and we quote from a letter of President Fischelis reporting the result of the conference to your chairman

"He (Surgeon General Patterson) told us that whereas the plans of the War Department contemplate an increase in the standing army, no corresponding increase in medical personnel has been provided for in any proposed legislation The Surgeon General stated that he considered it important to obtain additional personnel to carry on the work of the Medical Department in view of the increased number of enlisted men He hoped to secure the cooperation of all professional societies represented by commissioned personnel in the medical and allied departments of the army when the time comes to press for an increase in the personnel coming under his direction He stated that he recognized fully the importance of proper supervision of the pharmaceutical work in the army, but impressed upon us that ordinary dispensing such as is carried on in the army, need not be done by commissioned pharmacists He was of course, in favor of having a certain number of commissioned pharmacists attached to the Medical Corps to supervise dispensing and other pharmaceutical activities However he laid stress on the fact that in order to justify the expense of commissioned pharmacists in the higher ranks they would have to assume executive duties which go far beyond ordinary pharmaceutical work in civil life"

"He is not an opponent of commissions for well trained pharmacists who are graduates of four-year college courses, but he pointed out that the needs of the service would be met by assigning approximately one third of the commissions in the Medical Administration Corps to properly qualified pharmacists. He is absolutely opposed to a separate corps as he considers it inadvisable to detach the various auxiliary services of the Medical Department of the army from the Medical Corps itself."

Supplementing his statements of February 18th, under date of March 11th the Surgeon General wrote as follows:

"I heartily favor and will support legislation liberalizing the eligibility requirements of this Corps or, as we would prefer to call it, a Medical Auxiliary Corps. There are now two bills before Congress relative to the Medical Auxiliary Corps which, like all such piecemeal legislation, are unsatisfactory and which I must oppose. However, I believe that at the next session of Congress a new Medical Department bill will be introduced containing desired changes for all branches of the Medical Department and which will include provision for an adequate number of qualified pharmacists in the commissioned grades of that Corps."

That you may be informed even more fully of the attitude of the high command of the Army toward pharmacy and have a better understanding of some of the problems which must be considered by the Army administration, we quote from a letter written by Surgeon General Patterson, April 15th, in reply to a communication from Representative Jed Johnson of Oklahoma, asking what the attitude of the department would be to legislation proposing to increase the Medical Administrative Corps to include forty commissioned officers as pharmacists:

"I have your letter of the 8th instant and am very glad to give my opinion concerning the need for pharmacists in the Medical Department of the Army."

"For some years it has been recognized that it would be desirable and save much of the valuable time of medical officers to have a sufficient number of registered pharmacists in the Army responsible to the Surgeon General for the general dispensing of medicines in our larger hospitals and for the instruction of enlisted men who necessarily have to do the dispensing in the smaller hospitals. However, the plan that the Army has followed ever since the earliest days of its existence, and which is still in force, is that in *every hospital* an officer of the Medical Corps, in addition to his other duties, is directly in charge of the pharmacy and instructs the enlisted men who do this work in the pharmacy or dispensary. However, you may not know that in the Army the actual compounding of medicines is reduced to the minimum. We buy the larger proportion of all of our drugs in such form as to be ready for immediate use, for example, pills, capsules, tablets, certain tinctures, etc. At all of our larger hospitals, and to a lesser extent in the smaller ones, we naturally are obliged to compound some medicines and to make up stock mixtures, but there is little actual compounding of medicines in the Army compared to that carried on in drug stores in civil life. Another reason why there is less actual compounding of medicines in the Army is that we have a restricted Supply Table which does not include hundreds of drugs used in civil life. For reasons of economy and to lessen bulk and expense of transportation our list is confined to essential drugs in commercial use of approved value, specifics, and the newer remedies evolved from time to time believed to be of therapeutic value. In the Army the first assistant of the officer in charge of a pharmacy is usually a non-commissioned officer of some years of experience who has been well taught."

"At the present time there are forty registered pharmacists among the enlisted force of the Medical Department, approximately two thirds of whom are engaged in the dispensing of medicines. These men were trained in pharmacy in civil life prior to their enlistment in the Army. In the Navy pharmacists are enlisted men though the higher ones holding the grade of Chief Pharmacist are given warrants corresponding to the grade of Warrant Officer in the Army. They are not commissioned officers."

"A careful canvas of our hospital situation in the Army indicates clearly that we would not be justified in having high grade pharmacists, college graduates on duty at every small hospital. The amount of dispensing of medicines would not require their full time and the services of such specially educated men would be largely wasted if restricted entirely to the field of pharmacy. The only places where highly qualified pharmacists would fit into the present organization of the Medical Department of the Army would be at general hospitals and a few large station hospitals, but only in a definitely limited number."

"The present Medical Administrative Corps in many respects has not proven satisfactory to the Army in peace time. We could use the services of specially educated officers other than those who only have administrative qualifications, to assist the officers of the Medical Corps in their many and varied duties. I proposed to the War Department shortly after I became Surgeon General that a bill to reorganize and increase the strength of the Medical Department of the Army be introduced into Congress. At that time (October 1931) this was disapproved by the War Department on the ground that it was not a favorable time, owing to the economic situation. However, it will not be economy to postpone such action indefinitely. We feel that a certain number of pharmacists should be commissioned in the Medical Department of the Army, to assist in and be largely held responsible for the pharmaceutical service, just as medical officers are now and have been in the past, and that they should be incorporated into a corps of officers which will include other men who possess special knowledge and qualifications of a character which will be of assistance to the Medical Department as a whole in carrying out its mission. *i e*, the exclusion of the unfit, the prevention of disease, the maintenance of the health of the Army, and the care and treatment of military personnel whenever sick or injured in garrison or field.

"The Medical Administrative Corps as now constituted is therefore not satisfactory, because it is limited strictly to men who are supposed to have administrative qualifications. As a matter of fact, the title of this group should be changed to the Medical Auxiliary Corps in which could be placed men who have knowledge of many of the adjunct sciences or those which may be of distinct assistance to the medical service. For example, it would be an advantage to have several sanitary engineers in the new Medical Auxiliary Corps (when authorized by Congress), one or two botanists, one or two good hospital architects, one or two professional chemists, one or two entomologists, a group who are graduates of colleges of pharmacy, as well as former enlisted men who have had training in Army administration. All candidates for this Corps, however, should only be commissioned after a strict examination along general lines and in their specialties, with the requirement that no one should be eligible to take the examination unless of proper age, physically qualified, and a graduate of a four-year course in a college or university. In the case of candidates from the enlisted ranks, the examination would be of such a nature as to reveal evidence of knowledge equivalent to a college degree.

'You will see from what I have said that we are in favor of having certain changes made in the organization of the Medical Department of the Army, which will include the creation within it of a Medical Auxiliary Corps, and provide, among other specially trained men, such number of pharmacists as the actual needs of the Army justify. The Medical Auxiliary Corps in time of peace need never be a large one, but effort should be made to build up a Reserve of such officers for use in time of war.

'I believe that next year will be a favorable time for the Surgeon General to propose again to the War Department the introduction of a bill in Congress which, if enacted, will increase the strength of the Medical Department and authorize some of the organizational changes I have mentioned.

"My suggestion is that nothing be attempted at the present time, but that whenever a bill for the Medical Department is forwarded to Congress by the War Department all those interested, including the pharmacists' organization, should support the bill to insure its passage."

A conference with the Surgeon General was arranged for April 6th, and he also acceded to our request for an opportunity to visit one or more hospitals and arranged for those interested to observe the pharmaceutical requirements under the present form of organization.

To this meeting were invited representatives of the American Association of Colleges of Pharmacy and the National Association of Boards of Pharmacy. The result of this meeting was given publicity by a bulletin which coincident with its release to the pharmaceutical press was mailed to the deans of the schools of pharmacy and the secretaries of all state associations. The bulletin read as follows:

PHARMACEUTICAL SERVICE IN THE ARMY

"Representatives of the AMERICAN PHARMACEUTICAL ASSOCIATION, the American Association of Colleges of Pharmacy and the National Association of Boards of Pharmacy, met in Washington on April 5th and 6th at the invitation of Dr. H. Evert Kendig of Philadelphia, who is Chairman of the A. P. H. A. Committee on Pharmacy Corps, to continue the joint efforts to improve the

pharmaceutical service for the Army and to secure better recognition for pharmacists by improving their status

"Those present were R P Fischelis E F Kelly for the A P H A , Ernest Little, Townes R Leigh and A G DuMez for the A A C P , and R L Swain for the N A B P Unfortunately, Chairman Kendig was unable to attend on account of illness

"The first joint session was held on the evening of April 5th, when plans to broaden the work of army pharmacists were considered Saturday forenoon was occupied by visits at the invitation of the Surgeon General to the hospitals at the Army Medical Center and at Fort Myer The pharmacies at those hospitals and the work carried on in them were carefully inspected A conference with Surgeon General Patterson and Colonel McDonald followed, during which proposed legislation looking to a commissioned rank for Army pharmacists was discussed

"It is expected that a similar joint committee meeting will be held in Washington during June or July and that an encouraging report of progress can be made at the Portland, Oregon, meeting, August 5th-10th

"The efforts to secure a satisfactory status for pharmacy in the Army and the Navy have been interrupted by the reductions affecting these services during the depression This work is being taken up aggressively again and when a satisfactory program is worked out the national state and local associations will be informed and their cooperation requested "

The continuity of the committee's effort was somewhat interrupted by the expiration of General Patterson's term as Surgeon General He was succeeded June first by Colonel Charles Ransom Reynolds with the Rank of Major General

Secretary Kelly endeavored to arrange a meeting between our group and the new Surgeon General and in this connection was invited by General Reynolds to call June 17th to discuss plans for the meeting with the Committee As the appointment tentatively set for some day in July had to be canceled owing to General Reynolds suddenly leaving for Denver and San Francisco on official business, we insert a courteous and friendly letter which Surgeon General Reynolds wrote to Secretary Kelly July 18th It is informative and indicates the attitude of the new Surgeon General toward Pharmacy in the Army

"Official duties necessitate my leaving the office to day for a tour of inspection of Army General Hospitals within the continental United States, extending over a period of approximately three weeks I regret that this tour will delay the date of a conference to be held upon your request between myself and representatives of the AMERICAN PHARMACEUTICAL ASSOCIATION regarding proposed legislation authorizing the admission of registered pharmacists into the military service as commissioned officers

"My predecessors have favored legislation authorizing the reorganization of the Medical Administrative Corps into a Medical Auxiliary Corps wherein may be commissioned registered pharmacists sanitary engineers and other professional specialists not now provided for in the Medical Administrative Corps, as well as administrative specialists Unfortunately, economic conditions have prevented any increase in commissioned personnel of the Medical Department since 1920 Although I have not yet had the time to analyze thoroughly the needs of the Medical Department for additional commissioned personnel since my appointment recently, I may state that, in general, I agree with my predecessors on this subject I would like to make it clear that I do not favor the establishment of a separate Pharmacy Corps in the Medical Department

"I expect conditions in the near future to be more favorable for securing legislation providing for an increase in the Medical Department Upon my return to the office next month I shall give careful thought and consideration to proposed legislation for increasing the Medical Department

"I appreciate the interest of the members of the AMERICAN PHARMACEUTICAL ASSOCIATION in the Medical Department of the Army and shall be pleased to confer with their representatives sometime after September first, regarding the pharmaceutical service in the Army and its improvement

"Please extend my greetings and best wishes to the members of the AMERICAN PHARMACEUTICAL ASSOCIATION assembled in annual convention in Portland "

Bills to improve the pharmaceutical service in the army were introduced in the House of Representatives during the present session by Representatives McSwain of South Carolina, Evans

of New York, and Johnson of Oklahoma They were all referred to the Committee on Military Affairs where they stayed

From conversations held with congressmen, the general impression of your committee is that the members approached are friendly to a proposal to improve the pharmaceutical service in all branches of the Military Service and will support legislation having the approval of the ASSOCIATION and the Surgeon General As the Surgeon General is on record as favorable to the granting of commissions to properly qualified pharmacists in the proposed Medical Auxiliary Corps, and as he is very definitely opposed to the establishment of a Separate Pharmacy Corps your committee recommends

First—That the committee be continued and that it be instructed to continue its efforts to effect improvement in the pharmaceutical service in the Army, and to obtain therein for pharmacy the recognition and status to which it is entitled by virtue of its traditions and the useful service which it is prepared by education and training to render

Second—That the committee be instructed to cooperate with the Surgeon General in obtaining the passage of legislation which will bring about the substance of recommendation number 1 If the objective as stated in the recommendation number 1 cannot be attained by this procedure, we recommend

Third—That the committee be instructed to obtain the desired improvement in the pharmaceutical service and its concomitant recognition in the Army by direct appeal to Congress

Respectfully submitted

ROBERT L SWAIN B TAPPEN FAIRCHILD
FRANK L MCCARTNEY A L I WINNE
H EVERT KENDIG, *Chairman*

The report of the Committee on Prescription Tolerances was presented by Chairman Hugo H Schaefer, it will be published with the proceedings of the Section on Practical Pharmacy and Dispensing

Robert P Fischelis stated that the report of the Committee on Legislation Ambrose Hunsberger, *Chairman* would be mailed

The report of the Committee on Endowment Fund, James H Beal *Chairman*, was read by Secretary E F Kelly It was received and the Committee continued it follows

COMMITTEE ON ENDOWMENT FUND

It was agreed at the Washington meeting last year that the Committee on Endowment Fund would refrain from special activity until the planned campaign of the Committee on Maintenance Fund had been consummated

Nevertheless the Endowment Fund has continued to grow slowly A donation of Federal Farm Mortgage Bonds amounting to \$1000 00 was received during the year, and on June 30 1935 the Endowment Fund amounted to \$17 020 73

The Chairman has also received the promise from a member of the ASSOCIATION who has been more than usually successful in the practice of his profession that a provision will be inserted in his Will making a substantial addition to the permanent funds of the ASSOCIATION

J H BEAL *Chairman*

The report of the Committee to Draft a Model Restricting Distribution of Drugs and Medicines to Pharmacists W Bruce Philip *Chairman*, was presented by R L Swain who proposed that the report be referred for publication, it was so ordered

REPORT OF THE COMMITTEE TO DRAFT MODEL ACT RESTRICTING DISTRIBUTION OF DRUGS AND MEDICINES TO PHARMACISTS

It must be quite evident to all of you that those believing in and appreciating the profession of pharmacy should desire that drugs and medicines be sold to those qualified by law as pharmacists The states through their public and private school system have spent a considerable portion of the people's money to educate pharmacists to the point where they are privileged as graduates of schools of pharmacy to take state board examinations and become qualified pharmacists There is no reason why the states should permit others not so qualified to deal in the selling of articles that are so essential to public health It must be self evident that the public is

interested and should be protected, even if necessary by an extreme law, where the life and the health of the citizens of the states are involved by the handling of a commodity. With this in mind I review the principal status of state laws as now existing in the United States.

Most states restrict the filling of physicians' prescriptions to registered pharmacists. Even these laws have exceptions, the principal exception being that physicians, dentists and veterinarians may fill prescriptions for their own patients. State laws have frowned upon the allowing of qualified physicians, qualified dentists and qualified veterinarians to fill prescriptions for other qualified practitioners. These exceptions are based mostly upon the need for political compromise when the laws were just made rather than upon any general common sense principle. It is reasonable to presume that any practitioner who has to pay for medicine dispensed is apt to consider the cost of the medicine rather than the best interests and need of the patient. This exception is not in the public interest. While from a point of theory I feel sure the committee thinks that any law finally decided upon should restrict the filling of all prescriptions to the registered pharmacist, I do not believe it is politically practical to exclude other professional people in the medical group from filling their own prescriptions.

Next on the list of medicines largely restricted to registered pharmacists is the sale of poisons. Most states at the present time have laws restricting the sales of poisons to registered pharmacists. This is distinctly an admission that the registered pharmacist is the best qualified person to handle strong and powerful drugs and chemicals in the interests of the public. Here also we have exceptions that are to be found in these laws. These exceptions are also largely politically and economically needed to have a poison law passed by the average state legislature. Horticulturists and agriculturists use insecticide in large quantities. It is not exceptional for a ton of a poison to be sold to a member of this group. This means that the shipment from the manufacturer is usually direct by rail to the horticulturist or agriculturist. It is also common for the state to supply or supervise the sale of insecticide. This means distribution of these poisons through other than drug stores. Here I feel the pharmacist was not alert to follow his advantage of education and service in the earlier days and demand and receive the distribution of poisons needed for the spraying of vegetables and fruits. We find our state poison laws, therefore, in many states limiting the sale of insecticides and poisons to the registered pharmacist when they are sold in original packages such as are used by the average householder—roughly speaking in pound lots and less.

Next we may consider the sale of narcotics. With the exception of exempt narcotics these are sold through hospitals and state institutions and through the channels of the retail drug stores. I feel that the pharmaceutical associations will receive both state and federal support in enacting state laws restricting the sale of all narcotics—that is, including the exempt narcotic preparations by registered pharmacists. Probably hospitals and penal institutions will have to be excepted in handling narcotic drugs. Even here registered pharmacists should be employed.

New York has led the way in restricting that vast field of medicine known as proprietary medicine through the channels of the drug store. New York has enacted a law requiring supervision of sales by registered pharmacists where poisons and powerful medicines are ingredients in proprietary medicines. Pages after pages could be written why registered pharmacists should sell all medicines of interest to public health. Our opponents' strongest argument seems to be that in the past grocery and general dealers have sold proprietary and household medicines without detriment to the public health. This statement, though, is general and cannot be supported by facts and figures. The damage to public health by the general sale of medicines can never be proved in my opinion or accurately estimated. I understand Pennsylvania also has a restricting law as to some proprietary medicines.

This briefly covers the résumé of the present legal supervision of the sale of drugs and medicines. There are, it must be remembered, two important factors to any restrictive law. One is the need for a rigid enforcement of the law and the other is the legality of any law passed. It is common knowledge that many laws restricting the sale of drugs in some states are not enforced. This can be corrected usually by an adequate sum of money being granted to the state enforcement authorities—a sum sufficient for inspection and prosecution. The legality of a restricting law can often only be determined by a test in Court. It must be admitted that the police power of the states is far in excess of the so-called police power of our Federal Government. The recent United States Supreme Court decisions are therefore not in point when considering the possible unconsti-

tutionality of a state law regulating the sales of medicines and drugs, permitting them only to be sold by registered pharmacists

This committee was appointed at a time when a large majority of the state legislatures were in session. It was not at that time advisable in my opinion to endeavor to collect material for such a state law as is desired. This law is too important for snap judgment to be taken and a poorly prepared law presented to the states for introduction into the then convening state legislatures. Now that the state legislatures have adjourned and state pharmaceutical associations have met and their deliberations are a matter of record, a restrictive law can now be considered. The fall of the year is the best time to start collecting the necessary data for the formulating of the desired law. At least six months should pass in collecting this material. Then the committee should endeavor to frame such desired legislation as may help toward this much talked of ideal. After this a suggested law should be drafted and published, constructive criticism asked for and then a year and a half or two years hence a bill be finally discussed for the state associations to consider getting behind and introducing in their respective legislatures.

Therefore, in conclusion I ask that this committee be continued although I also suggest that the new president of the AMERICAN PHARMACEUTICAL ASSOCIATION be free, if he desires to appoint a new chairman and a new committee. I also offer the suggestion that it may be better in the opinion of the president or the ASSOCIATION that this committee function as a sub committee of the legislative committee or some other committee that has already been appointed having a similar obligation and one that is collecting similar, if not the exact data from the various states.

On behalf of the committee I wish to state that the other members of the committee are experienced, seasoned legislators. Their words and opinion are to be carefully considered at all times. They are competent to help form any model law that pharmacy needs. Personally I would suggest their retention on a new committee when appointed. The fact that this committee has not reported a law at this time is in no way due to their neglect or their unwillingness to do their part.

W BRUCE PHILIP, *Chairman*

The report of the Committee on Development of Pharmacy Laws was called for, Chairman R L Swan made a verbal report and will be followed by a written report to be published.

Secretary E F Kelly presented a verbal report for the Committee on Press Relations. In concluding he thanked the members of the Local Committee through whom the fullest press report of the meeting had been made possible.

Secretary E F Kelly reported verbally for the Committee on Professional Relations. L A Seltzer, *Chairman*. Report is to be mailed. On motion by C T Gilbert and a second the report was referred to Council.

The delegate of the Scientific Section, F E Bibbins, presented the report for the Section, it follows:

To the House of Delegates, AMERICAN PHARMACEUTICAL ASSOCIATION

The Scientific Section held three regular sessions and one joint session with the Section on Practical Pharmacy and Dispensing.

Fifty one papers were presented and discussed. Thirty-nine papers were presented by title.

The following recommendations from the Committee on Chairman's address were approved. The report follows:

Your Committee commends the Chairman for his thoughtful address.

We approve Recommendation 1. 'The Board of Review on Papers shall be given power to reject or accept papers, or parts of papers, for publication and to require revision by the authors when necessary.'

I move that the Scientific Section instruct the secretary of the Section to request that the Council of the AMERICAN PHARMACEUTICAL ASSOCIATION grant the authority to the Board of Review on Papers necessary to carry out the objective of this recommendation.

We approve Recommendation 2. The Board of Review on Papers shall be increased to ten members each serving for five years. They shall be appointed by the Chairman. Any vacancies shall be filled by the contemporary Chairman.

I move that the Board of Review on Papers be increased to ten members, that the Chair

man appoint two members to serve for a term of five years, two members to serve for a term of four years, two members to serve for a term of three years, two members to serve for a term of two years, two members to serve for a term of one year, that in 1936 and in each year thereafter two members be appointed by the Chairman to serve for a term of five years "

Your Committee approves the intent of Recommendation 3 "The Board shall draw up a list of rules and regulations for the guidance of its members and of authors This list shall be presented for approval by this Section at the next annual convention " Since instructions to authors are now carried in the JOURNAL and are subject to continuous revision at the request of members and with the consent of the Editor, your Committee believes that no action on this recommendation is necessary at this time

Recommendation 4 "That a regulation be adopted requiring each paper to be presented as given on the program either in total or in abstract, and original copies of the paper to be turned over to the secretary at that time In each case of inability to appear in person, the author should delegate some one else to present the paper " Your Committee does not approve this recommendation We feel, however, that the intent of the recommendation should be carried out as effectively as possible by the officers of the Section We do not feel that the acceptance of papers by title should be prohibited Signed by the Committee LOYD E HARRIS C O LEE, FRANCIS E BIBBINS, F O TAYLOR, GLENN L JENKINS, *Chairman*

The report of the Committee on Ebert Prize awarding the prize this year to Marvin J Andrews for his paper presented at the Washington meeting on 'Determination of a Reasonable or Permissible Error in Dispensing' was approved

The following officers were elected and installed

Chairman, H M Burlage, *First Vice Chairman* Glenn L Jenkins *Second Vice Chairman* J C Ward, *Delegate to the House of Delegates* E V Lynn

(Signed) F E BIBBINS, *Secretary*

The report of the Section on Historical Pharmacy was presented by Heber W Youngken *Secretary*, it follows

The Section on Historical Pharmacy held two sessions on August 7th and August 8th, during which twenty six papers covering a great variety of historical subjects were presented fourteen of which were read by title

The following officers were elected for the ensuing year

Chairman, Heber W Youngken *Secretary*, Loyd E Harris *Historian* Eugene G Eberle, *Delegate to the House of Delegates*, C O Lee

(Signed) H W YOUNGKEN, *Secretary*

(See also report of Committee on Resolutions, page 712)

The report of the Section on Education was presented by George C Schicks as follows

Twenty one papers were presented before the Section on Education and Legislation on a wide variety of subjects of educational interest

There were two meetings of the Section and one joint meeting with the Conference of Pharmaceutical Law Enforcement Officials All of these meetings were well attended

The following resolutions were presented and adopted

'To the end that helpful information regarding ways and means of encouraging the prescribing of U S P and N F drugs and preparations by dentists be disseminated and made available to the pharmacists of this country, and to the end that the good work of one community or state may not be lost to other communities or states, therefore, *be it resolved*

'That a Committee be appointed—to be known as the National Committee on Professional Information Pertaining to Dental Pharmacy Its specific function shall be

'*First*—To study the methods used by the various local county and state organizations in their efforts to bring before dental men usable information on U S P and N F drugs and preparations

'*Second*—To present to the pharmacists of the nation at our next annual convention a digest of constructive ideas gathered from such a survey and other sources

'*Third*—The Committee is to act as a center for receiving and disseminating information which will increase the pharmacist's opportunities for professional scientific service to the dentist "

Be it further resolved that the Chairman of the Section on Education and Legislation appoint a Committee to study the problem of cooperation with hospital pharmacists and their service to the allied medical professions

Resolved, that the Section on Education and Legislation go on record as requesting the AMERICAN PHARMACEUTICAL ASSOCIATION to create a body or bodies with the necessary working facilities to give the pharmacists in this country up to date information on such pharmaceutical and medical material as new drugs preparations, formulas standards, plans for detailing doctors and dentists, as well as other medical groups, and other information which will prove helpful and be instrumental in increasing the cooperation and service of the pharmacist to the allied medical professions This information is to appear periodically throughout each year and some method be devised so that all pharmacists may be privileged to take advantage of such a pharmaceutical service

The following officers were elected for the 1936 Section on Education and Legislation
Chairman, C Leonard O Connell, *Vice Chairman* George C Schicks, *Secretary*, George A Moulton, *Delegate to the House of Delegates* L W Rising

(Signed) GEORGE C SCHICKS, *Delegate*

(See report of the Committee on Resolutions page 711)

The report of the Section on Practical Pharmacy and Dispensing was presented by Ralph W Clark

The Chairman's address was given the Secretary's report read and the papers presented The following recommendations were approved

Recommendations from Chairman's Address

1 The Chairman of the Committee on Glass Standardization previously requested that this Committee be discontinued but the Section overruled the recommendation Since he repeats this request I recommend that the Committee be discontinued unless recent developments have arisen which warrant its continuation

2 I recommend the continuation of the Committee for the collection of information pertaining to professional pharmacy and that the Council be requested to appropriate \$75 00 to carry on this work '

Recommendations made by the Committee for the collection of information pertaining to Professional Pharmacy

1 This Section, in cooperation with the Section on Education and Legislation, or the ASSOCIATION should foster a vigorous program to find out wherein the education of pharmacists is lax in respect to the attainment of professional ideals thereby endeavoring to uplift the dignity of pharmacy as a profession

2 The Section or the ASSOCIATION should make a survey as to the number of hospitals employing registered pharmacists as compared with those that employ more

3 The ASSOCIATION should endeavor to enlist the many hospital pharmacists in this country to join the A P H A as these men are the first to actually contact the young physician after they graduate

4 The Section or the ASSOCIATION should encourage hospital pharmacists to conduct dignified, scientific laboratories offering every assistance in the way of consultation, research etc, instead of conducting just a 'Pill Dispensing' storeroom

5 The ASSOCIATION should endeavor to correlate and supply authoritative information that will be of aid to local and state associations in promoting the use of official products

(Signed) RALPH W CLARK *Delegate*

The report of the Conference of Pharmaceutical Association Secretaries was presented by Charles J Clayton

The Conference of Pharmaceutical Association Secretaries held two sessions (Wednesday afternoon and Friday morning) both presided over by President F V McCullough of Indiana

In the absence of Secretary Carl G A Harring, of Massachusetts J Lester Hayman, of West Virginia acted in that capacity

Sixteen states were represented by the Secretaries of their respective associations

In addition to the two sessions previously mentioned, there was also held on Thursday

evening, a joint session of the Section on Education and Legislation, the Conference of Law Enforcement Officials and the Conference of Secretaries

At the Final Session, the following officers were elected

President, John Slocum, Iowa, *First Vice President*, Roy S Warnack, California, *Second Vice President*, Wm B Day, Illinois, *Secretary-Treasurer*, Carl G A Harring, Massachusetts

Executive Committee The four elected officers and F V McCullough, Indiana, R C Wilson, Georgia, J Lester Hayman, West Virginia, Jennings Murphy, Wisconsin, A L I Winne, Virginia *Delegate to the House of Delegates*, Charles J Clayton, Colorado

(Signed) CHARLES J CLAYTON

The reports of the Committee on State Codes and of the Committee on Code Matters were called for

Secretary E F Kelly stated that because of the decision of the Supreme Court having discontinued the Drug Code, no report would be made He recommended that and asked that the report be considered as received and the committee be discontinued

No report was received from the Committee on Professional Relations

The report of the Committee on Resolutions was called for Chairman R L Swain thanked the members of the Committee

The report of the Committee on Resolutions is printed on pages 708 to 715 of the August JOURNAL A PH A

In order to avoid duplication in printing only Recommendation No 1 is reprinted An addition was made to the Committee report on Recommendation No 9—matter in brackets at end—EDITOR

Recommendation No 1

It is recommended that it shall be the policy of the AMERICAN PHARMACEUTICAL ASSOCIATION to require its full-time officers to confine their pharmaceutical activities to the affairs of the ASSOCIATION This is not to be interpreted as an abridgment of the privilege to take part in related affairs in the capacity of advisor, committeeman or delegate It is, however, to be interpreted as abridging the privilege of serving in a secretarial or managerial capacity to any other organization or group or to act as the spokesman or representative of any other organization or group within the sphere of pharmaceutical activity unless permission to do so is specifically granted by the Council

The Committee is sympathetic with the principle of this recommendation in the President's Address but feels that the purpose can be fully effectuated by referring it to the Council for further study and for whatever action it deems to be in the best interest of the ASSOCIATION

After the reading of Recommendation No 1 and of the Committee's report, President Fischelis moved that the President's recommendation be substituted for that of the Committee, this motion was seconded by W J Husa It was discussed by Robert P Fischelis W J Husa and others A *viva voce* vote was taken A roll call was requested and W J Husa was asked to check the delegates with the secretary, the vote was tabulated by Chairman Rowland Jones and Chairman R L Swain of the Committee Roll Call showed 25 in favor of the substitute motion and 18 against the secretary not voting Recommendations of the president up to No 8, inclusive, as submitted by the Committee were adopted

No 9 was referred to the Council the secretary of the National Association of the Boards of Pharmacy and the secretary of the American Association of Colleges of Pharmacy President Fischelis moved an amendment, that the Council on Pharmaceutical Practice of the ASSOCIATION be included The amendment was carried

The Recommendations 10 to 17, inclusive were adopted

Recommendation on Resolutions of the New York Branch was approved and referred to Council, Recommendation on Local Branches was referred to Council Recommendations on Weights and Measures, Section on Education and Legislation Section on Historical Pharmacy were adopted the one on publications of the latter was disapproved The resolution of R L Irazary and the one relating to the American Association for the Advancement of Science were adopted The resolution from Indiana Pharmaceutical Association and the one submitted by the Section on Education and Legislation were approved and referred to Council All other recommendations of the Committee on Resolutions were adopted as presented

The report of the Committee as a whole was then approved

There being no Unfinished Business, Chairman Rowland Jones installed Roy Bird Cook as *Chairman* of the House of Delegates, and C. Thurston Gilbert as *Vice Chairman* who responded with thanks for the honor conferred

The session of the House of Delegates was then adjourned

PROCEEDINGS OF THE LOCAL BRANCHES

'All papers presented to the Association and Branches shall become the property of the Association with the understanding that they are not to be published in any other publication prior to their publication in those of the Association, except with the consent of the Council'—Part of Chapter VI, Article VI of the By Laws

ARTICLE III of Chapter VII reads "The objects and aims of local branches of this Association shall be the same as set forth in ARTICLE I of the Constitution of this body, *and the acts of local branches shall in no way commit or bind this Association, and can only serve as recommendations to it* And no local branch shall enact any article of Constitution or By-Law to conflict with the Constitution or By Laws of this Association "

ARTICLE IV of Chapter VII reads "Each local branch having not less than 50 dues paid members of the Association, holding not less than six meetings annually with an attendance of not less than 9 members at each meeting, and the proceedings of which shall have been submitted to the JOURNAL for publication, may elect one representative to the House of Delegates "

Reports of the meeting of the Local Branches shall be mailed to the Editor on the day following the meeting, if possible. Minutes should be typewritten with wide spaces between the lines. Care should be taken to give proper names correctly and manuscript should be signed by the reporter. *Please advise us of changes in Roster and mail reports promptly*

PHILADELPHIA

The regular monthly meeting of the Philadelphia Branch, AMERICAN PHARMACEUTICAL ASSOCIATION, was held Tuesday night October 8, 1935, at 8 15 P M at the Philadelphia College of Pharmacy and Science. E. H. MacLaughlin presiding.

The minutes of the last meeting were read and approved.

Dr. James C. Munch, chairman of the membership committee, presented the name of John Zinsser, recently elected president of Sharp & Dohme for membership. Mr. Zinsser was unanimously elected to membership in the Local Branch.

The speaker of the evening, Prof. E. Fuller ton Cook, chairman of the Revision Committee U S P XI was then introduced. His topic was 'The New Features of the Revised Pharmacopoeia.' The speaker began his most interesting dissertation with a review of the history of the U S P and then proceeded in a masterful fashion to explain the organization set up and functions of the Revision Committee and the way it carried on business. He discussed certain pertinent changes in titles in the U S P XI as well as certain additions and deletions. Changes in requirements for stor-

age and preservation were delineated—this brought forth discussions from the floor.

The Local Branch was indeed fortunate in having the chairman of the Revision Committee discuss the U S P XI, for no one is more able to do this than Professor Cook. We can now more fully appreciate the tremendous amount of research and revision work necessary and certainly each and every pharmacist in the United States should feel proud that the Revision Committee is in such capable hands.

A rising vote of thanks was given the speaker for the information presented.

GEORGE E. BYERS, *Secretary*

CHICAGO

The first fall meeting of the Chicago Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held Tuesday evening October 22nd at the University of Illinois College of Pharmacy.

The speakers of the evening were Samuel Shkolm, who discussed 'Current Topics at the Recent N A R D Convention in Cincinnati' and Lawrence Templeton, told of "The A P H A Convention in Portland" and Pharmacy Salmon and Cascara in Oregon."

A diversified and interesting discussion followed.

THE REMINGTON MEDAL AWARD

At the April 8 1918, meeting of the New York Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION, a special committee made a report, adopted by the Branch and later by the Council of the A P H A , which resulted in the establishment of the Remington Honor Medal The suggestion leading to the provision was made by Hugo H Schaefer and he has ever since directed the activities of the committee in charge of the annual award The recommendations for the award are worded as follows

That a gold medal to be known as the Joseph P Remington medal and suitably engraved to be awarded to the man or woman who has done most for American Pharmacy during the preceding year where the result of these efforts would be considered as being the most important and advantageous for American Pharmacy That no bar be placed as to the candidate's profession or kind of work accomplished '

That the medal be awarded by a standing committee consisting of all the past-presidents of the AMERICAN PHARMACEUTICAL ASSOCIATION, and in case the number of living past-presidents is less than five, the senior past vice-presidents of the ASSOCIATION be drawn upon in sufficient number to create a committee of five "

The secretary of the New York Branch is to act as secretary of this standing committee, the medal is to be presented by the Senior Past President of the Branch or in case of inability by other past presidents in the order of their seniority

SAMUEL L HILTON—THE 15TH REMINGTON MEDALIST



Samuel L Hilton
Remington Medalist



Inscription on Remington
Medal



Joseph P Remington—Face
of Medal

The Testimonial Dinner and the award of the Remington Medal was an outstanding function at the Mayflower Hotel, Washington, D C—under the auspices of the New York Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION the District of Columbia Pharmaceutical Association District of Columbia Board of Pharmacy, District of Columbia Veteran Druggists' Association Faculty, George Washington School of Pharmacy—October 19 1935 Augustus C Taylor, *Chairman*

More than 200 guests were in attendance, including members of the ASSOCIATION, of the National Association of Retail Druggists, of the Ladies Auxiliary, of local bodies, of the Reciprocity Club, relatives and friends Hundreds of letters and messages evidenced the esteem in which the medalist is held Mrs Hilton was presented with beautiful flowers, and decorations added to the splendor of the reception and banquet room Besides the District of Columbia New York Pennsylvania, Delaware, Maryland, New Jersey, Massachusetts, Virginia and, probably, other states were represented and few if any, states were missing among those who sent congratulations The toastmaster, R L Swan, performed his duty interestingly and expeditiously and did not take the time of the speakers Among the latter were Dr Elmer Louis Kayser, dean of the Students of George Washington University and Head of the Department of History, Dr C W Ballard, president of New York Branch, A P H A , Dr Harry A Fowler, past-president of the Medical Society of the District of Columbia, Prof E Fullerton Cook, chairman of the Revision Committee, United States Pharmacopœia, Dean Theodore J Bradley, of Massachusetts

College of Pharmacy, Secretary E F Kelly, of the AMERICAN PHARMACEUTICAL ASSOCIATION Dean H V Army, Columbia University College of Pharmacy, and Mrs S L Hilton who graciously acknowledged flowers and the words of greeting There were songs by Carson P Frailey and Miss Agnes Fealy and accompaniments by Mrs A C Taylor

Having given an outline of the delightful function, a few words from each of the addresses, including that of the recipient of the medal, follow

Dr Kayser referred to the high regard in which Dr Hilton is held and the valuation placed on the information given the pharmacy students

Dr Ballard explained the procedure in the medal award and the pleasure of New York Branch in making the presentation

Dr Fowler spoke of his relation with the well and favorably known pharmacist and the information received on many occasions from him The major portion of the address dealt with the important part of pharmacy in the progress of medicine

Professor Cook discussed the work involved in pharmacopœial revision and the devotion to and unselfish contributions made during many years by Dr Hilton without fear or favor so that the best results may be obtained and referred to improvements which resulted from his suggestions

Dean Bradley introduced his remarks by a number of well told stories, a happy faculty which marks him as a speaker on occasions of this kind He then referred to the guest of honor as one who is ever ready to render unselfish service without thought of personal favor, and spoke of many years of friendship and mutual association activities

Secretary Kelly interspersed his remarks with a story here and there He referred to the many years of acquaintance, the sterling qualities which contributed largely to the success of the building project and credited the medalist with the performance of essentials that resulted in the beautiful structure His efforts on a number of occasions cleared situations that required the guidance of one who knew of relations that existed and of one who had contacts, developed through years of acquaintance, and possessed information relative to civic and governmental affairs When the time came that work could be started on the foundation of the building the knowledge possessed by Sam Hilton," who as a lad played in this section on the very grounds now occupied by the INSTITUTE OF PHARMACY was of great value From the time that the first stone was placed, day by day as the structure took shape, this enthusiast visited the site Of no other person can it be said that he has as intimate an acquaintance of the location ground sand mortar stone and equipment as the guest of honor On later occasions, when it became necessary to adjust other matters it was again the information and acquaintance possessed by him which were essentially helpful

Carson P Frailey paid tribute by his words in the song, Friend of Mine ' A like appreciation (friend of mine) was given by members of the Reciprocity Club represented as a body on this occasion

The presentation of the medal was made by Dr H V Army who referred to the quality of service rendered by the recipient of the medal which it was his pleasure to present He considered this a great honor and congratulated him as a faithful member and the ASSOCIATION upon so worthy a son of American Pharmacy

ABSTRACT OF REMARKS BY THE MEDALIST

After impromptu appreciative references to the toastmaster and the speakers of the evening the recipient greeted them the members of the Committee of the New York Branch and other participating organizations

In his introductory remarks he acknowledged the honor of being deemed worthy of the award and extended thanks and referred to the thought which resulted in the memorial to a leading American pharmacist and the plan by which it is perpetuated

Continuing, he spoke of his early acquaintance with Professor Remington, in 1890, and the friendship formed was strengthened on the journey with him and other distinguished pharmacists to New Orleans in 1891 when he attended the first meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION He referred to a conference on pharmacopœial matters in Washington when the hours of the delightful evening ended at 4 o'clock in the morning

On many occasions thereafter it was his pleasure to be with Professor Remington—in the

class room, in the home and the annual meetings of the ASSOCIATION. He spoke of Remington's outstanding qualities of leadership and happy conversation, his ability to adjust difficulties and promote successful organization work, whereby improvements were made effective by the ASSOCIATION. He spoke favorably of his chairmanship in pharmacopoeial revision and authorship. In concluding his remarks the medalist referred to his happiness as a result of work and again expressed thanks and appreciation for the honor conferred.

Moments of visitations among friends closed the evening's ceremonies.

PHARMACY AND THE PUBLIC HEALTH

BY ROBERT P. FISCHELS

Lateness in the month prevents extended reference to the timely Radio address ushering in Pharmacy Week by former president, Robert P. Fischels, of the AMERICAN PHARMACEUTICAL ASSOCIATION delivered from station WEAf, New York, over the Red Network of the National Broadcasting Co., on Saturday evening, October 19th 7 45-8 00 P M.

Reference to an article by a prominent physician writing in one of the national magazines, in which he referred to Pharmacy as "a vanishing profession," served in part as a text. Rather than not do justice in making brief abstracts the concluding remarks of the address only are quoted.

In the observance of National Pharmacy Week, October 20th to 26th, the professional pharmacists of America will again demonstrate to the public through displays in their shop windows that they are keeping alive the best traditions of the medical profession in all its branches. It is significant that during the past year the two annual awards for outstanding achievement in pharmacy have been made on the basis of activities involving retail pharmacists. The Ebert Prize which is annually awarded by the AMERICAN PHARMACEUTICAL ASSOCIATION for scientific achievement was given to Professor Andrews of the University of Maryland for his researches on methods of improving the accuracy of prescription compounding. The Remington Honor Medal awarded annually by the New York Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION to the person, who in the opinion of the majority of ex-presidents of the ASSOCIATION, has done most for American Pharmacy in the preceding year or over a period of years, is being awarded to night in the City of Washington to Samuel L. Hilton, a practicing retail pharmacist of that City for activities connected with the erection of the beautiful headquarters building of the AMERICAN PHARMACEUTICAL ASSOCIATION.

"One hundred and thirty thousand registered pharmacists in nearly sixty thousand retail drug stores of the United States are thus encouraged to carry on. They believe that pharmacy is not a vanishing profession."

INTELLIGENT SERVICE

Progress, development and service are the watchwords of any science or profession and pharmacy must and is doing its share in advancing the general health sciences. The corner drug store is open about 18 hours out of the 24 and the druggist is on call at all hours to supply needed medicines to the sick. The purpose of his training is not the selling of merchandise as that is secondary but to intelligently serve his community when medicinal supplies are needed. — C. B. JORDAN

WHO SPEAKS FOR AMERICAN PHARMACY?

This question is asked repeatedly in the halls of our National and State Legislatures. It is asked by the heads of Governmental Bureaus—both national and state. It is being asked with increasing frequency by members of other professions engaged in providing medical care. It is a question which has become of more than passing interest to the public and it is a question which in the light of recent developments pharmacists are asking themselves, because there is a growing suspicion that what should be the right answer to the question does not coincide with the facts as we find them. —Dr. Robert P. Fischels in an address at the annual meeting of the National Association of Retail Druggists, Cincinnati.

EDITORIAL NOTES

RED CROSS ROLL CALL

Red Cross service is as wide as humanity's ills, meeting all manner of distress on the basis of individual and community need. Its two-fold programs of cure and prevention range in scope from the ministering to victims of disasters to teaching how to bandage a cut finger. There is scarcely a situation of human suffering which the Red Cross is not called upon to meet.

Even a volunteer organization such as the Red Cross must have funds with which to carry on and these are provided by the four million men and women who annually join the Red Cross and whose membership dues support its activities.

Join at Roll Call November 11th-28th



AN APPRECIATION

THE PHARMACY EXHIBIT at the 1933 34 Century of Progress Exposition at Chicago, which was conceived and developed by the committee appointed for this work, has shown the development of American Pharmacy to millions of people from every part of the world. This scroll is presented by the AMERICAN PHARMACEUTICAL ASSOCIATION as a token of appreciation to



Reduced etching of scroll presented to H C Christensen, Julius Riemenschneider, and Frank A Kirby. See page 817 September JOURNAL A PH A.

RECOGNITION OF OUTSTANDING SERVICES FOR PHARMACY AT CENTURY OF PROGRESS EXHIBITION

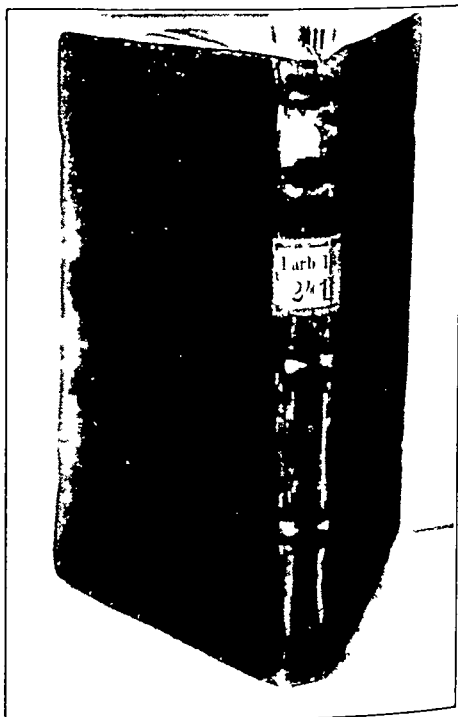
The AMERICAN PHARMACEUTICAL ASSOCIATION expressed its appreciation by individual scrolls to H C Christensen, Julius Riemenschneider and Dr Frank B Kirby for their valuable services in connection with the work represented by the Pharmacy Exhibit at the Century of Progress Exposition, Chicago.

Miss Esther H Barney served with distinction in superintending the exhibit and Thad-

deus Niemiec was in charge of the pharmaceutical dispensing. A copy of the scroll presented to Miss Barney is shown in the *C R D A News* for October 5th, page 56. The scroll awarded to her is signed by the Local Committee H C Christensen, Julius Riemenschneider and Frank B Kirby and by President R L Swain and Secretary E F Kelly of the AMERICAN PHARMACEUTICAL ASSOCIATION. The same applies to the scroll of Thaddeus Niemiec.

THE BADIANUS MANUSCRIPT

The Magazine Section of the *Washington Post* October 13th, features an article on Strange Discovery—First Book of Plant



Science" by Dr Frank Thone. Dr Emily Walcott Emmart contributed an interesting paper to the Section on Historical Pharmacy A PH A on the subject, printed in the JOURNAL, A PH A for September, pages 771-774. Since then Dr Emmart has visited the Vatican Library, examined the book and was granted permission to photograph it. The manuscript

is 6 by 8 $\frac{1}{4}$ inches, bound in crimson velvet, it is clearly written in Latin and Aztec. The text is exquisitely illustrated with pictures which retain their brilliancy of color, these have been copied in water color sketches, through the kindness of Dr Charles G Abbott, of the Smithsonian Institution. A half tone from the photograph mentioned is shown herewith.

NEWER PRESERVATIVES USED IN PHARMACY

Most of the early work in the esters of *p* hydroxybenzoic acid was summarized by S Back (*P J*, 128, 328 (1932)). Later, H Burlinson (*Quart J Pharm Pharmacol*, 7, 489 (1934)) found the propyl and ethyl esters to be efficient for the preservation of mucilage of tragacanth. The propyl derivative in a concentration of 0.05 per cent appeared to be the best preservative for the mucilage. The author has found that a 1 per cent w/v solution of tartaric acid in water in which ordinarily a mold appeared within twenty four hours may be preserved by the addition of 0.05 per cent of methyl *p* hydroxybenzoate or 0.01 per cent of propyl *p* hydroxybenzoate. In the case of fresh infusion of calumba while 10 per cent of alcohol (90 per cent) effectively preserved it, 0.15 per cent of methyl *p* hydroxybenzoate preserved it for four days only, while the propyl ester had practically no preservative effect in strengths up to 0.075 per cent.—E E NYE (*Austral J Pharm* 590 183 (1935), through *The Pharmaceutical Journal* of July 6, 1935).

ASSESSING ABILITY TO PAY

Physicians, dentists, pharmacists, members of hospital staffs and nurses of Omaha and county will be included among the members of the Omaha, Douglas County Central Health Service Association which will seek to reduce the charity rolls. Each low income patient will be questioned regarding his or her ability to pay—then a card will be given stating the ability to pay—one fourth, one-half or whatever portion is determined. When the patient visits the doctor a card conforming to schedule is presented and the physician charges the proportion designated. Similar procedure follows in prescription service.

KENTUCKY U S P EXHIBIT

The *Journal of Kentucky Pharmaceutical Association* for October carries on its cover a

print of the U S P Exhibit made at the annual meeting of the Kentucky State Medical Association, sponsored by this organization, the Kentucky State Pharmaceutical Association, Jefferson County Medical Society and Louisville Retail Druggists' Association. Along with the display, cooperative publicity material was distributed which gave information relative to U S P chemicals and proprietary products, preparations of the Pharmacopoeia and those known under proprietary designations.

The display and cooperation are helpful evidence in the interest of public health and better professional service.

THE YEAR BOOK AND MONTHLY ABSTRACTS

The *Rocky Mountain Druggist*, for October 1935, gives an interesting outline of the subjects considered in the YEAR BOOK for 1933 and comments favorably on this work as well as the publication of the monthly abstracts of pharmaceutical literature which have appeared in the *JOURNAL* of the A P H A since the March issue.

In closing the review the *Rocky Mountain Druggist* states the publication of "Pharmaceutical Abstracts" will make available each month a comprehensive review of literature for retailers, wholesalers, manufacturers, teachers, editors, research workers and all others connected with the profession and industry of pharmacy and marks another step in the enlarged service which the ASSOCIATION plans for all who are interested in professional and industrial pharmacy.

Appreciation is expressed for the detailed comment.

The October "Pharmacy Week" issue of the *Druggists' Circular* may be designated a work of art, brilliantly conceived and executed, containing also timely articles by Dr Charles H Mayo, of the Mayo Clinic, Rochester, Minn., Dr Lloyd K Riggs, director of research and Prof George C Schicks, of Rutgers University College of Pharmacy, Dr H A B Dunning and others.

A prominent feature of the issue is the five page section of photographs of the AMERICAN INSTITUTE OF PHARMACY, Washington, taken specially for the publication by Underwood & Underwood.

INFANTILE PARALYSIS SERUM

A serum, said by Dr E C Rosenow of the Mayo Foundation to be effective in the treat-

ment of infantile paralysis, was demonstrated in Louisville before members of the Kentucky State Medical Association. A conference was convened in San Diego, called by President Roosevelt to make Nation wide plans to eradicate infantile paralysis and to promote measures designed to lessen the handicap of those who have been crippled by the dread disease. The work outlined is to be under the Warm Springs Foundation.

Infantile paralysis has never attained the epidemic proportions of the plagues which ravaged civilization in earlier periods but when it is considered that 75 per cent of the 17 000 patients admitted to one of the Scottish Rite Hospitals for Crippled Children have suffered from disease or deformity originating in the infantile paralysis it becomes everybody's responsibility because no one is free from the attack, or members of the family may be stricken.

PERSONAL AND NEWS ITEMS

Preston Dunn, druggist of Eskridge, Kans., has been elected commander of the Kansas department of the American Legion. He is a former mayor of Eskridge.

Hans Heger's 80th birthday was celebrated by the Austrian Pharmaceutical Society, of which he is the secretary. He is also active in an editorial capacity of the official Austrian pharmaceutical publications. Congratulations are extended and best wishes for continued health.

President A C Taylor, of the District of Columbia Pharmaceutical Association warns pharmacists to be careful relative to returns under the law requiring payment of tax on cosmetics and toilet preparations. He refers particularly, in this instance, to rose water and glycerine.

Dean A. Richard Bliss, Jr, of the School of Pharmacy of Howard College of Birmingham Alabama, represented Columbia University at the inauguration of Doctor Alfred Benjamin Butts as Chancellor of the University of Mississippi on October 19th.

Dr C H Searle advises that a research fellowship has been established at the State University of Iowa under the supervision of Dr Henry Gilman professor of Organic Chemistry, and another fellowship at the University of California Medical School under the supervision of Dr C D Leake professor of Pharmacology.

Dr Francisco Cignoli, of Buenos Aires, has favored us with a reprint on National Formularies. The writer is much interested in the JOURNAL OF THE A P H A. The reprint is in Spanish, the following formularies are discussed from an historical and present viewpoint. The National Formulary, American, Brazil, Germany (Erganzungsbuch), Great Britain (The Pharmaceutical Code), France, "Formulaire Generale des Pharmaciens Francais," Belgium Formulaire National. Military and hospital formularies also receive attention.

J A Reese has been appointed to a graduate fellowship at the University of Florida.

T D Rowe, of the University of Montana, succeeds J A Reese at the School of Pharmacy Medical College of Virginia.

Dr R Eder, Institute of Pharmacy, Zurich Switzerland, contemplates making a visit to the United States. He hopes to be in this country about the middle of November.

The Evening Sun (Baltimore) of October 1st speaks editorially of Sir Henry Wellcome in connection with the medal associated with his name and awarded for valuable military service. The medal has recently been awarded to Major Leon A Fox U S A, attached to the 104th Medical Regiment.

Radio talks by Frederick J Wulling, dean of the College of Pharmacy, University of Minnesota are delivered each Wednesday over WLB, 1 00 to 1 15 P M from October 23rd to November 27th inclusive, on the following subjects: Pharmacy Week Anniversary, Pharmacy and the Public.

Famous Discoveries by Pharmacists, "Medicines Obtained from Animals," "Medicines Obtained from Bacteria" and "Drugs Mentioned in the Bible."

Abstracts of Scientific Literature have been prepared by the staff of the Library of E R Squibb & Sons Miss E Pickering, Director, contributed through the courtesy of F W Nitardy and published under the auspices of the U S P Board of Trustees.

PHARMACY WEEK IN THE DAILY PRESS

The interest in pharmacy has been evidenced in the Press by editorials and most of the articles coming to our attention have expressed a helpful purpose to promote professional pharmacy. Every day during Pharmacy week these editorials have appeared emphasizing that the annual occasion is worthy of public attention and that "the present trend is to

make the prescription department the heart of the store, with ware and apparatus accurate, immaculate and aseptic "

MONTANA EARTHQUAKES

A property loss of several million dollars on October 19th was reported from earthquakes and fire damages. Several deaths and many injuries were reported, the American Red Cross is active and helpful, and Helena officials soon had the situation well in hand.

FUNCTION OF MUSEUMS

Museums may be storehouses, but little else, the collecting, labeling and arrangement seem to be the only reasons for their establishment. A museum's existence should be justified by the extent to which it gives information and understanding. A museum should have a purpose to serve the students of the subject which is displayed.

OBITUARY

L E HIGHLEY

L E Highley, one of the pioneer pharmacists of South Dakota—member of the AMERICAN PHARMACEUTICAL ASSOCIATION since 1913—died September 16th in Rochester, Minn., following an illness of several weeks.

Mr Highley was born in Storm Lake, Iowa, March 13, 1876. With his parents he moved on February 14, 1887, to Whitewood, S D., where he received his grade school education. He was graduated from the pharmacy department of the State University of Iowa on March 17, 1897.

For thirty-five years Mr Highley had been in the drug business in Hot Springs, and during that time took a prominent part in helping to shape the development of the city. He was a member of the Masonic lodge, the Kiwanis club and the Chamber of Commerce. He served three terms in the South Dakota state senate in the years, 1909, 1928 and 1930 and contributed largely to the passage of South Dakota pharmacy laws.

Mr Highley was serving his fourth term as mayor of Hot Springs and it was in large measure his careful attention that has placed its affairs on a sound financial basis.

Besides his wife, Mr Highley is survived by three brothers, George, Edgemont, William, Whitewood, Elmer, San Francisco.

WALTER TREAT WALKER

Walter Treat Walker, Vice President In-Charge-of-Sales of the Kimble Glass Company of Vineland, N J., died suddenly at White Sulphur Springs, West Virginia, Wednesday evening October 2nd. Mr Walker was fifty-two years of age, a graduate of the Sheffield Scientific School of Yale University and a member of the Yale Club of New York.

City, and the Penn Athletic Club of Philadelphia. He was also a charter member of the American Legion, having served in the Air Section of the United States Signal Corps with the rank of Captain. He is survived by his widow, Mrs. Kate Walker, and his eight-year-old son, William.

DR CARL DUISBERG

The death is announced of Dr. Carl Duisberg at the age of 73. Dr. Duisberg was the founder and president of the German Dye Trust and the inventor of aspirin. He joined the staff of the Laboratory Elberfeld Dye Factories of Fr. Bayer and Co. when he was 21, and ultimately he became the company's managing director. When the leading dye factories were fused into I. G. Farbenindustrie A. G. he became chairman of the Supervisory Board and of the Administrative Council of the firm. Among the many important positions he held were chairman of the Reich Federation of German Industry, member of the Reich Health Bureau and Cologne Railway Council and member of the Prussian Academy of Science.

HENRY C. BIDDLE

The death is announced of Dr. Henry Chalmers Biddle, former dean of the College of Pharmacy of the University of California, aged 65 years. His activities included those of author, clergyman and educator. From 1901 to 1918 he taught in Monmouth College and the University of Chicago, for a period he was acting professor in Temple University, Philadelphia. He was lecturer in San Francisco State Teachers' College from 1922 to 1931 and professor of chemistry in the University of California School of Pharmacy, and was elected dean of the institution in 1926, retiring in 1932.

SOCIETIES AND COLLEGES

BALTIMORE

The October meeting of Baltimore Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION will be held on the 31st at Emerson Hotel. The speaker of the evening will be Dr David M R Culbreth, Emeritus Professor of Materia Medica, School of Pharmacy, University of Maryland, elected *Honorary President* of the AMERICAN PHARMACEUTICAL ASSOCIATION. His subject will be 'How can a person be satisfied and contented while making a living and a reserve for old age in the retail drug business?' A function of the evening will be the presentation of the Ebert Prize Award to Marvin J Andrews by Secretary E F Kelly, A PH A.

C JELLEFF CARR *Secretary-Treasurer*

MEETING OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

The ninety fifth meeting of the American Association for the Advancement of Science, together with scientific organizations associated with it, will convene in Pittsburgh during the Christmas holidays. The meetings begin on Thursday evening, December 27th, when the city and the institutions of Pittsburgh will extend an official welcome to their guests in the Carnegie Music Hall. Prof E L Thorndike, the distinguished psychologist president of the Association, in a brief address will respond for the visitors. A reception tendered by the Pittsburgh Local Committee will follow.

STATE BOARD REQUIREMENTS

Secretary H C Christensen has revised state board requirements for entrance to Registered Pharmacist examination. He is making the charts available and points out that pharmacy has taken rapid strides toward higher standards. A study of the chart shows that the four year college course with one year of retail experience is now prevailing in most states. Only five states are without provision for compulsory college training. We hope to publish the chart later and in the meantime the information can be obtained from the Secretary 130 North Wells St, Chicago, Ill.

WEST VIRGINIA STATE OFFICERS

The following officers were elected by mail

ballot by West Virginia Pharmaceutical Association

President, E O Wiseman Fayetteville, *First Vice President* James A Patterson, Martinsburg, *Second Vice President*, W S Coleman, Lewisburg, *Third Vice President*, Fred A McFarlin, Clarksburg *Secretary Treasurer*, J Lester Hayman, Morgantown *Council Member*, Marlinton. These officers will be installed next June at White Sulphur Springs.

GIFT TO MEDICAL COLLEGE OF VIRGINIA

Through an anonymous gift of \$300,000.00 and a federal grant of \$239,850.00 an out patient clinic building with associated medical laboratories, which has been planned by the institution for several years, will shortly go under construction. The building will be seven stories in height the four lower floors to be assigned to clinics, the upper floors for teaching laboratories in pathology bacteriology biochemistry, public health and preventive medicine.

RHO CHI SOCIETY

The annual convention of Rho Chi Society was held at the Hotel Multnomah Portland, Oregon on Wednesday August 7, 1935. There were approximately one hundred members and guests present at the banquet, at which Dean R A Lyman, of the School of Pharmacy University of Nebraska, was the speaker. L W Rising University of Washington, was installed as the new *National Treasurer*, and Loyd E Harris as *National Secretary*. F J Bacon and H M Burlage continue as *National President* and *National Vice President*, respectively, for another year. Glenn L Jenkins University of Maryland and Elmer H Wirth, University of Illinois were elected as members of the *Executive Council* for a period of two years.

Loyd E HARRIS, *National Secretary*

VETERANS OF THE CHICAGO AND MILWAUKEE ASSOCIATIONS MEET

Veterans of the Milwaukee and Chicago Associations met on October 17th, at Bismarck Hotel Chicago. This was an exchange visit the last meeting having been held in Milwaukee. The presidents of the two organizations presided.

Communications were read from Governor Horner and from F W Meissner of La Porte, Indiana. The details of the successful meeting were arranged by Secretaries Von Hermann and Mrazek.

CHICAGO MEDICAL SOCIETY

The Chicago Medical Society is continuing its work on the U S P and N F. A meeting of the committee was held on October 8th. Dr J J Gill and Dr Bernard Fantus were re-appointed on the Committee and Dr Otto S Pavlick was appointed as a new member. All of them have had pharmaceutical experience and have contributed largely to therapeutics.

DELAWARE PHARMACEUTICAL SOCIETY ISSUES MONTHLY BULLETINS

Delaware Pharmaceutical Society is issuing a monthly bulletin of information. It is contemplated to discuss a wide variety of subjects—laws and regulations, proposed legislation, professional pharmacy, trade practices, etc. The secretary of the Society is Albert Bunn, 1713 W 4th Street, Wilmington.

HOSPITAL PHARMACY

The Western New York Hospital Council, an organization composed of hospital executives at its October meeting devoted its program to pharmaceutical problems. Three well-prepared papers were presented by hospital pharmacists on the subjects 'Pharmaceutical Economics,' and 'The Preparation and Chemistry of Surgical Solutions.'

IDAHO STATE PHARMACEUTICAL ASSOCIATION BULLETIN

Idaho State Pharmaceutical Association Bulletin for October 15th has an interesting account of the meeting of AMERICAN PHARMACEUTICAL ASSOCIATION by Dean E O Leonard. This issue also contains much of interest for Idaho druggists and part of the resolutions adopted by the National Association of Retail Druggists.

PHARMACY RECOGNIZED LEGALLY AS A PROFESSION IN CALIFORNIA

The Supreme Court of California has ruled that the statute prohibiting aliens from registering as pharmacists as applied to Japanese is not invalid as conflicting with the treaty extending to Japanese citizens the right to carry

on trade or to own shop as if they were citizens of the United States, since the practice of pharmacy is a profession and not a trade (St 1933, p 2193, —2 3 Treaty of Commerce and Navigation between the United States and Japan Art 1, 37, Stat 1504) *Sashihara vs State Board of Pharmacy—Bulletin XXXI*, W Bruce Philip.

MEDICAL COLLEGE SCHOOL OF PHARMACY

Dean W F Rudd advises that the limit of one hundred students in the School of Pharmacy has been reached. Of the new matriculants sixteen had completed one or more years of academic college work, six have their Bachelors degrees and two their Masters and M D degrees.

OFFICERS OF THE NATIONAL WHOLESALE DRUGGISTS' ASSOCIATION

The following officers were elected by the National Wholesale Druggists' Association at the annual meeting, held at White Sulphur Springs, September 29th to October 4th: *President*, William J Schieffelin, Jr, New York, *First Vice-President*, George B Evans, Albany, N Y, *Second Vice President*, E A Morrison, Meridian, Miss, *Third Vice-President*, W F Terry, San Francisco, Calif, *Fourth Vice-President*, H M Folsom, San Diego, Calif, *Fifth Vice President*, J O Robinson, Baltimore, Md.

Members of the Board of Control, J C O'Dell, Birmingham, Ala, S O Davidson, Kansas City, Mo, J B McCormick, Pittsburgh, Pa, and Arthur S Raymond, Lincoln, Neb.

John W Phillips, New Orleans, was elected *Honorary President* of the Association, and William A Hover, Long Beach, Calif, was elected to *honorary membership*.

The Association voted to hold its 1936 convention in the Greenbrier Hotel, White Sulphur Springs, not earlier than the first week in October.

Quoting the Oil, Paint and Drug Reporter "Enactment of legislation to clarify the provisions of Section 2 of the Clayton act with regard to discriminatory prices and such other legislation as may be necessary to aid in the elimination of unfair trade practices which seriously jeopardize the welfare of retail and wholesale druggists was favored by the National Wholesale Druggists' Association in a

resolution approved by its Board of Control and adopted at its sixty first annual convention. The resolution followed discussions of the subject by President A Kiefer Mayer, Secretary E L Newcomb, Robert F Vaughan, Association counsel under the NIRA and various committee chairmen.

The Association considered other legislative developments of the past year, such as the Wagner Labor Bill, the Social Security Act, and State fair trade laws, and took the position that, inasmuch as the constitutionality of much of this new legislation is seriously questioned by eminent legal authority, it should adopt a policy similar to that which it followed in respect to the NIRA.

The Association recorded itself as a proponent of the basic principles of the Nye-King bill and favored the principles involved in the Patman bill. It commended its proprietary goods committee for assistance given to manufacturers and distributors with respect to lawful operation under fair trade laws and urged that this work be continued. The Association reiterated its position with respect

to food and drug legislation which will adequately protect the public but not unnecessarily handicap the drug industry."

OFFICERS OF THE NATIONAL ASSOCIATION OF RETAIL DRUGGISTS

The officers elected for the ensuing year by the National Association of Retail Druggists are the following: *President*, Charles Ehlers Cincinnati, Ohio, *First Vice President*, Z V Kerrigan, St Louis Mo, *Second Vice President*, Harvey L Wertley, Philadelphia Pa, *Third Vice President*, Walter H Varnum, Lawrence Kans, *Secretary*, John W Dargavel Chicago, Ill, *Treasurer*, H L Chichester, Macon, Ga. *Executive Committee*, *Chairman* Thomas S Smith, Wilmington, Del, George L Second, Chicago Ill, Monte L Powell, Denver Colo, Harvey A Henry, Los Angeles Cal, John Witty Portland, Ore, Hugh P Berne New Haven Conn. The *Editor* of the *N A R D Journal* is George A Bender and *Washington Representative*, Rowland Jones.

LEGAL AND LEGISLATIVE

Executive Officer A C Hill, Jr, has addressed former code authorities stating that in cases where the records and files of former Code Authorities are in danger of loss or destruction due to liquidation, or lack of facilities for storage, the custodians thereof should immediately contact the National Recovery Administration in order that it may arrange for proper storage. Confidential records will of course be preserved as such.

TEXAS LEGISLATURE PROVIDES FOR LICENSES

The Texas Legislature has provided license fees as follows: Upon one store the license fee shall be \$1 00, upon each additional store in excess of one and not to exceed two, the license fee shall be \$6 00, upon each additional store in excess of two but not to exceed five the license fee shall be \$25 00. Further assessments are fixed upon each additional store in excess of five and not to exceed ten, \$50 00, upon each additional store in excess of 10 but not to exceed 20 the license fee shall be \$150 00, up to 35, a \$250 00 license is assessed upon each additional store in excess of 35 but not to exceed 50, the license fee shall be \$500 00,

and for each additional store in excess of 50 the license fee shall be \$750 00.

LEGALIZING PRICE AGREEMENTS BY AMENDMENTS TO SECTIONS 1 AND 45, TITLE 15, U S CONGRESS

'Sec 1 Contracts in Restraint of Trade among States Illegal—Every contract, combination in the form of trust or otherwise or conspiracy, in restraint of trade or commerce among the several states, or with foreign nations is hereby declared to be illegal, *provided that nothing herein contained shall render illegal contracts or agreements prescribing minimum prices for the sale or resale of a commodity which bears or the label or container of which bears, the trade-mark, brand or name of the producer or owner of such commodity and which is in fair and open competition with commodities of the same general class produced by others, when such contracts or agreements are lawful under any statute now or hereafter in effect in any State, Territory or the District of Columbia in which such sale or resale is to be made and the making of such contracts or agreements shall not be an unfair method of competition under Section 45, Title 15 U S C* Every person who shall

make any contract, or engage in any combination or conspiracy declared to be illegal by this act, shall be deemed guilty of a misdemeanor and, on conviction thereof, shall be punished by fine not exceeding five thousand dollars or by imprisonment not exceeding one year, or by both said punishments, in the discretion of the court"—*Drug World*

PROPOSED NEW YORK HEALTH CODE CHANGES

The *Drug World* gives the following as the principal points in the proposed amendments to the New York City Sanitary Codes

'1 Every proprietary medicine or cosmetic sold in New York City shall be registered with the Board of Health at an initial annual cost of \$25.00 and renewal cost of \$10.00

'2 Products listed in the latest revision of the U. S. Pharmacopoeia or National Formulary are excepted. Also excepted are proprietaries each container of which bears the notice 'May not be sold except upon a doctor's prescription'

'3 A Certificate of Registration may be denied or revoked if a false or misleading statement is made in the application for registration, for false or misleading advertising, for a claim that a product is a cure, if the product contains poisons or dangerous substances in quantities to make it potentially harmful if the product contains alkaloid cocaine alpha or beta eucaine, more alcohol than needed for solvent or preservative, or alcohol not sufficiently medicated to be unfit for beverage purposes, if it contains methyl alcohol more than lawful quantities of opium or any radio active ingredient, if a formula, name or label is changed without approval of the Board of Health

'4 The amendments shall become effective June 1, 1936, but shall not apply to stocks in the hands of persons other than manufacturers at that time

'5 Applications for registration shall give name of product, name and address of applicant (if applicant has no New York address, address of agent on whom papers can be served) place of manufacture and by whom, name or chemist or pharmacist in continuous supervision exact text of every judgment decree or stipulation ever issued in connection with the product, therapeutic and other beneficial effects claimed exact form of label on retail package, all literature distributed in connection with the product exact text of all advertising material to be used in any manner

within the following three months a sworn statement of the quantitative and qualitative formula, a sample of the product and container'

WISCONSIN FAIR TRADE ACT IN COURT

A test case has been started in the circuit court at Milwaukee involving the Wisconsin Fair Trade Act. The plaintiff is the Wisconsin Wine & Spirit Importers Co. The defendant attacks the constitutionality of the Act on the grounds that it unlawfully attempts to legalize price fixing. The fair trade act became a law in Wisconsin several months ago. Wisconsin pharmacists originated agitation for the act and were prime movers in the formation of the Wisconsin Federation of Independent Associations which sponsored the bill.

VITAMIN C EASILY DESTROYED

In general vitamin C is the most easily destroyed of all the known vitamins, also it is easily soluble in water so that rejection of cooking water or the "water" of such canned vegetables as asparagus, peas or string beans may result in the loss of a large part of the vitamin C which had escaped destruction, and furthermore, fruits are often preserved prepared and eaten with such large amounts of added sugar that the vitamin value (and mineral content) is materially diluted and at the same time the consumption of actual fruit diminished because of the extent to which the sugar satiates the appetite—SHERMAN, H. C. "Food and Health," New York: MacMillan Company, 1934 through *Journal A. M. A.*

BOOK NOTICES AND REVIEWS

Medicinal Plants of France—The Center for Technical and Economic Documentation on Medicinal and Aromatic Plants (formerly the National Office of Primary Vegetable Materials for the Perfumery and Drug Trades) continuing the work begun, has just published a new series of engravings, in color, of wild and cultivated medicinal plants, representing the first edition of the 3rd and last volume, the first two volumes containing two articles and 104 plates, representing the complete collection up to date. A few of these series are exhausted and will not be published again.

Due to its consistently perfect execution and its scientific and artistic value, this 13th Series will be appreciated just as much as the previous

series by every one interested in botany and *materia medica*. It will be of the same service to collectors and cultivators of medicinal and aromatic plants, and also useful in various kinds of studies. The 8 plates composing this 13th Series represent Black Mustard, White Mus-

tard and Field Mustard, Cerise Laurel and Common Laurel, Odoriferous Asperule and Garance, Chiendents (Dog Teeth), Petit Houx and Official Asparagus, Reglisse and Galega, Ricin (Castor), Grande Absinthe and Marine Absinthe.

NOTICE TO CONTRIBUTORS TO THE JOURNAL AMERICAN PHARMACEUTICAL ASSOCIATION

The following notice has been prepared from comments received from members of the Board of Review of Papers and of the Publication Committee.

Manuscripts should be sent to Editor E. G. Eberle, 2215 Constitution Ave., N. W., Washington, D. C.

All manuscripts should be typewritten in double spacing on one side of paper 8½ x 11 inches, and should be mailed in a flat package—not rolled. The original (*not* carbon) copy should be sent. The original drawings, not photographs of drawings, should accompany the manuscript. Authors should indicate on the manuscript the approximate position of text figures. All drawings should be marked with the author's name and address.

A condensed title running page headline, not to exceed thirty-five letters, should be given on a separate sheet and placed at the beginning of each article.

The method of stating the laboratory in which the work is done should be uniform and placed as a footnote at end of first page, giving Department, School or College. The date when received for publication should be given.

Numerals are used for figures for all definite weights, measurements, percentages, and degrees of temperature (for example 2 Kg., 1 inch, 20.5 cc., 300° C.). Spell out all indefinite and approximate periods of time and other numerals which are used in a general manner (for example one hundred years ago, about two and one-half hours, seven times).

Standard abbreviations should be used whenever weights and measures are given in the metric system, e. g., 10 Kg., 2.25 cc., etc. The forms to be used are cc., Kg., mg., mm., L. and M.

Figures should be numbered from 1 up, beginning with the text-figures (line engravings are always treated as text-figures and should be designated as such) and continuing through the plates. The reduction desired should be clearly indicated on the margin of the drawing. All drawings should be made with India ink, preferably on white tracing paper or cloth. If coordinate paper is used, a blue lined paper must be chosen. Usually it is desirable to ink in the large squares so that the curves can be more easily read. Lettering should be plain and large enough to reproduce well when the drawing is reduced to the width of a printed page (usually about 4 inches). Photographs intended for half tone reproduction should be securely mounted with colorless paste.

'Figure' should be spelled out at the beginning of a sentence, elsewhere it is abbreviated to 'Fig.,' per cent.—2 words.

The expense for a limited number of figures and plates will be borne by the JOURNAL, expense for cuts in excess of this number must be defrayed by the author.

References to the literature cited should be grouped at the end of the manuscript under the *References*. The citations should be numbered consecutively in the order of their appearance (their location in the text should be indicated by full sized figures included in parentheses). The sequence followed in the citations should be: Author's name (with initials), name of publication, volume number, page number and the date in parentheses. Abbreviations for journals should conform to the style of *Chemical Abstracts*, published by the American Chemical Society.

(1) Author, A. Y., *Am. J. Physiol.*, 79: 289 (1927).

Papers presented at the Sections of the AMERICAN PHARMACEUTICAL ASSOCIATION's annual meeting become the property of the ASSOCIATION and may at the discretion of the Editor be published in the JOURNAL. Papers presented at these Sections may be published in other periodicals only after the release of the papers by the Board of Review of Papers of the JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

The Editor will appreciate comments from Board of Review and Committee on Publication, members, authors and others interested.



The panel, Phos Kai Elpis of the AMERICAN INSTITUTE OF PHARMACY, represents Light and Hope, the woman symbolic of Hope leads the invalid toward Light, the lamp on the pedestal symbolizes, in this interpretation, the knowledge to cure. The woman holds the staff of Æsculapius, the invalid follows, hoping that the Science of Medicine will restore him to health.



The designer, Ulysses A. Ricci, endeavored to express in this bas-relief panel *Pharmakeutike* of the AMERICAN INSTITUTE OF PHARMACY, the advancement of Pharmacy. The youth depicts the progressive step, the senior represents the pioneer, observing the improvements made as fruits of his earlier researches.

JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

VOL XXIV

NOVEMBER, 1935

No 11

THE SCULPTURAL PANELS OF AMERICAN INSTITUTE OF PHARMACY

The designer of the two bas-relief panels of the AMERICAN INSTITUTE OF PHARMACY is Ulysses A. Ricci of New York City, and they were carved in place by John Donnelly under Mr Ricci's supervision. The latter states that he has endeavored in the panel on the left, *Pharmakeutike*, to express the progress and advancement of pharmacy. The youth represents the progressive step, the senior represents the pioneer in pharmacy, looking on and observing the advancement made—the fruits of his earlier researches.

The following, part of a paragraph from an introductory lecture to a course in History of Pharmacy by Dr. Edward Kremers before the American Association of Colleges of Pharmacy at the Madison meeting,¹ may be applicable in this connection.

'If Greek literature was brought to Italy and thence to countries north of the Alps after the capture of Constantinople by the Turks, when Greek scholars sought refuge for themselves and their manuscripts in Italy and elsewhere, Greek medical texts had previously been spread over northern Africa and across the Mediterranean into Italy and Spain by the Moors. Not the original Greek, it is true—in this respect the medico pharmaceutical renaissance differed from the later rebirth of classical Greek literature—but through Syrian and Persian translations and then into Arabic. Just as in ancient Greece lay medico pharmaceutical practice had gained for itself a social position of its own as opposed to priestly standing, so during the middle ages, medicine and likewise pharmacy acquired footholds of their own quite independently of the monasteries and convents. With it came the separation of pharmacy from medicine as foreshadowed by the public apothecary shop of Bagdad in the 9th century, and as it was further developed in some of the Italian cities as reflected in the edict of Roger of Sicily, and more particularly in the edicts of Frederick II, ruler of the Holy Roman Empire of the German Nation from 1215 to 1250. Not that the separation was complete. For a long time physicians and apothecaries were members of the same guilds. Moreover, the physicians for a long time constituted the ruling branch of the professions united in the same guild and lorded it over their former confrères even after the apothecaries were permitted to have their own guild.'

The other panel, *Phos Kai Elpis*, depicting a woman—hope leading the invalid—represents Light and Hope, the woman, symbolic of Hope leads on toward

¹ See JOURNAL A. P. H. A., December 1933, pages 1270-1279.

Light—the lamp on the pedestal, symbolizing in this case the knowledge to cure, she holds the staff of Æsculapius and the invalid follows, hoping that the science of medicine will restore him to health

The following lines are taken from the address heretofore quoted

'Medico pharmaceutical practice of the primitive Celts and Germans had been largely in the hands of 'wise' women and priests as was the case with other primitive peoples. Pagan practices, medico pharmaceutical as well as religious, centered about the descendant of the 'wise' woman of an earlier civilization "

Dr Charles Moore,¹ in speaking at the dedication of the Pharmacy Building, said that into the sphere of the architectual influence exercised by the Lincoln Memorial the Pharmaceutical Building comes. Referring to the former, he said, "the building, like the man, belongs to the ages." "On its inner walls are carved Lincoln's Gettysburg Address and his Second Inaugural, heart-born thoughts expressed in diction comparable with Pericles' immortal oration over the Greeks who fell at Thermopylæ. This building (Pharmacy) has become a vital portion of the frame to the Lincoln Memorial picture." Dr Moore said—"How vital is this relationship was very recently told me by your reticent architect, John Russell Pope

'When plans were being made to mark Abraham Lincoln's birthplace at Hodgenville Kentucky, the program of competition called for one building to embody in its architecture as well as its contents the spirit of Lincoln. I submitted a design based on this representative idea. When a totally different scheme was adopted, I put away my drawing sadly as every artist does when he finds one of his conceptions fails of realization. Years passed. This Pharmaceutical Building came to me. I made many sketches. One day the design for the Lincoln Birthplace came to mind. I got it out of its repose and found that to my mind essentially it solved the double problem of a building with a purpose and yet in spirit akin to the Monument in whose company it stands

"Such in brief is the story of the inception and conception of this Pharmacy Building. unconsciously the spirit of the design—its elegant simplicity, the richness of its landscape setting, its thorough appropriateness, instantly impress artist and layman alike." Dr Moore concluded by congratulating the ASSOCIATION on providing a fitting home for the life-saving service the profession performs and expressed the hope that the members would persevere in well-doing in spirit and in architecture

PROFESSIONAL TRAINING FOR LIBRARIANS

Charles C. Williamson, dean of the School of Library Service, Columbia University, writing in *New York Times* of November 10th states that "an entirely new type of professional training for librarians will result from action recently taken by the faculty of the School of Library Service, Columbia University

This action consists of the adoption of a new curriculum designed to prepare the student for the higher levels of professional library service. The public library will, for example, be treated less as an efficient machine for the circulation of books and more as a primary agency in every community for adult education. In all but the larger centres it also will be viewed as the focal point for the cultural and intellectual interests of the whole population outside of the formal education provided by the public schools."

¹ Chairman, National Commission of Fine Arts

EDITORIAL

E G EBERLE, EDITOR

2215 Constitution Ave , WASHINGTON, D C

THE PHARMACOPŒIA AND NATIONAL FORMULARY

THE first American Pharmacopœia, "Pharmacopœia for the Use of Army Hospitals" was compiled by William Brown, M D , at Lititz, Pa , and published in Philadelphia in 1778, a second edition appeared in 1781 (see JOURNAL A PH A , November 1927, page 1090, October 1930, page 1041)

The Pharmacopœia of the Massachusetts Medical Society was presented in manuscript June 5, 1807, it was "prepared conformably to a vote of the Counselors, passed on the 3rd day of October 1805, and published in Boston, December 17, 1807 " The following paragraphs are quoted from the Preface

' Such a work is mutually convenient to the physician and apothecary As it is the business of the physician to prescribe and the apothecary to prepare medicines the physicians as a body ought to point out those articles of medicine, which they shall ordinarily employ, and the standard preparations of them "

Only the last lines of the last paragraph are quoted

"They (the members of the Massachusetts Medical Society) cannot therefore hesitate to solicit the aid of all scientific men in effecting a revolution, so very desirable for the correct practice of medicine, a revolution which concerns the reputation and success of every medical practitioner, and the health and safety of every individual "

The Pharmacopœia of the New York Hospital was published in 1816 A copyright was obtained by Collins & Co in conformity to the Act of the Congress of the United States, entitled an Act for the Encouragement of Learning, etc The publication was prepared by Samuel L Mitchell and Valentine Seaman, *Committee*

The first Pharmacopœia of the United States, officially recognized and of which the history is given in subsequent editions of the U S Pharmacopœia, was prepared under the direction of Dr Lyman Spalding and appeared December 15, 1820, and copyrighted on the same date by Ewer and Bedington, Cornhill, Number 51, printed by Wells and Lilly, of Boston (See JOURNAL A PH A , August 1917, page 675)

The United States Pharmacopœia XI will become official June 1, 1936 Instead of making comment at this time, reference is made to the "Report on the United States Pharmacopœia, Eleventh Revision" by Chairman E Fullerton Cook, published in the September JOURNAL A PH A , on pages 796-800 and to the historical accounts printed in the forthcoming and prior editions of the Pharmacopœia

The National Formulary VI will become official at the same time as the U S Pharmacopœia XI The National Formulary has an historical introduction to which reference is made, to recent Council Letters bearing on the subject and the report of Chairman E N Gathercoal, published in the JOURNAL A PH A for August, pages 689-694

The Pharmaceutical Recipe Book II, will be completed at an early day and reference is here made to the report of Chairman J Leon Lascoff in the August issue of the JOURNAL, pages 694-699

The two standards reflect credit on the professions and a valuable service has been rendered by the publication of the Recipe Book

The Pharmacopœia XI and National Formulary VI will be on sale December 16th

LIMITATION OF THE NUMBER OF PHARMACISTS

EVERYWHERE the matter of limiting the number of pharmacists is a subject for discussion and this applies to all other lines of activities, in every case the remedy is clear enough but in most instances, if not all, the application is very difficult or impossible, perhaps we need a new attitude on the definition of rights. There is a difference relative to the right of opening a drug store for service and of another where the purpose is an investment on which to make profit and because of larger means or ability in handling money and merchandise and using these means for the destruction of another with smaller means or lesser ability.

The subject is discussed in European pharmaceutical publications relative to pharmacy, here as elsewhere there are extreme views which are answered by those who hold that every citizen should have free choice of a profession, or at least training for a profession, and no limitations should be placed. Germany reduced the number of University students in 1934 by about 60 per cent. In France, the number of pharmacy students has increased, in Italy the sale of medicinal products is allowed only by pharmacists and the authority to open and carry on a pharmacy is in the hands of the Board of Health and the Mayor, a provision being that a new pharmacy may not be opened at less than 500 metres from another already in existence, modification in sparsely settled communities applies.

The foregoing comments are made for the purpose of showing that the difficulties which obtain here are also subjects of discussion in other countries where the possibilities for regulation are not so difficult, all of which points to the necessity of better coordination, and greater cooperation, and a consideration of right and tempering the desire for wealth and power.

PHARMACY AND THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

BY JOHN C. KRANTZ, JR. *

THE pharmaceutical sciences are very embracing in their scope. For a number of years an effort has been put forth to establish definitely for pharmacy a place in the semi-annual meetings of the American Association for the Advancement of Science. This goal was achieved last June at the Minneapolis meeting, where pharmacy held a session as Section N2 along with Section N Medical Sciences. The meeting was well attended and the papers presented were comprehensive in their scope and indicated the definite increment of progress achieved by the scientific workers in the field of drugs.

Another pharmaceutical program is being planned for the coming St. Louis meeting (December 30th-January 4th) of the American Association for the Advancement of Science.

* *Councilor* from the AMERICAN PHARMACEUTICAL ASSOCIATION to the American Association for the Advancement of Science.

vancement of Science At this meeting Section N2 Pharmacy is planning two sessions, one, a joint session with Section N Medical Sciences, and two, an individual section

The following papers have been accepted for the two sessions

PROGRAM, AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

(N) Medical Sciences

(N2) Pharmacy

- 1 "The Meaning of the Phenol Coefficients " George Reddish, St Louis College of Pharmacy (15 minutes)
- 2 "Chemistry of Aloin and Some Related Materials," John H Gardner, Washington University, St Louis, Mo (20 minutes)
- 3 "Some Unsymmetrical Aryl Sulfides and their Bactericidal Properties," Noel E Foss, School of Pharmacy, Duquesne University (20 minutes)
- 4 "The Effect of Chlorinated Ethylenes on the Perfused Leg Vessels of the Frog " John C Krantz, Jr, C Jelleff Carr, Ruth Musser and William Harne, School of Medicine, University of Maryland (15 minutes)
- 5 "The Use of the X-ray in Determining the Value of Enteric Coatings," F S Bukey, College of Pharmacy University of Nebraska (20 minutes)
- 6 "The Differential Pharmacognosy of the Two Lobes of the Pituitary Gland," Heber W Youngken Massachusetts College of Pharmacy (15 minutes)
- 7 "Microchemical Pharmacognosy," Elmer H Wirth School of Pharmacy, University of Illinois (15 minutes)
- 8 "Crude Drug Assays of the U S P XI," C B Jordan and H G DeKay School of Pharmacy Purdue University (15 minutes)
- 9 "The Determination of Iodine in Thyroid Combination," George D Beal, Mellon Institute, Pittsburgh (15 minutes)

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE, JOINT SESSION OF SECTION (N) MEDICAL SCIENCES AND (N2) PHARMACY, PHARMACY PROGRAM

- 1 "The New Alkaloid of Ergot," Marvin Thompson, School of Pharmacy, University of Maryland (20 minutes)
- 2 "Further Studies on the Adrenal Cortical Hormone," W M Firor and Arthur Grollman, Departments of Surgery and Pharmacology and Experimental Therapeutics Johns Hopkins University (20 minutes)
- 3 "Cyanide Poisoning and Its Treatment," K K Chen, C L Rose and G H A Clowes, Indianapolis, Ind (20 minutes)

The councilors urge that publicity be given to this meeting in the vicinity of St Louis and that the schools of pharmacy send delegates to attend and participate in the discussions

JAPANESE PHARMACOPŒIA COMMISSION

THE revised law creating the Commission for revising the Japanese Pharmacopœia is placed under the supervision of the Minister of Home Affairs The Commission is composed of one president and not more than sixteen members Temporary members may be appointed if necessary for special work The secretaries are appointed for the Commission on recommendation of the Home Minister

The Commission comprises seven physicians and surgeons

Fumihide Okada, chief of the Health Bureau of the Department of Home Affairs Chika-hiko Koizumi, Surgeon-General Shunichiro Takasugi, Inspector General of Fleets and Hospitals

Kenzo Tamura, Doctor of Medicine, professor of the Imperial University of Tokyo Junjro Shimazono, Doctor of Medicine professor of the Imperial University of Tokyo Taichu Kitajima Doctor of Medicine, professor of the medical department of Keio University, and the president of the Japan Physicians' Union Chujiro Nishino, Doctor of Medicine, professor of the medical department of Keio University

The president of the Commission and seven pharmacists are members

Katsuzaeon Keitmatsu, Doctor of Pharmacy, professor of the Imperial University of Tokyo (who has the court rank of shoshu and decorated with the Third Order of Merits) Yutaka Kinugasa, Doctor of Pharmacy, member of the Imperial Hygienic Laboratory in Tokyo Eizo Machiguchi Doctor of Pharmacy, member of the Imperial Hygienic Laboratory in Tokyo Dunta Taguchi, Pharmacist General Heizaburo Kondo Doctor of Pharmacy professor of the Imperial University of Tokyo Yasuhiko Asahina Doctor of Pharmacy, professor of the Imperial University of Tokyo Akira Ogata Doctor of Pharmacy, professor of the Imperial University of Tokyo Naoichi Fujita, Doctor of Pharmacy, assistant professor, Imperial University of Tokyo

One physician and two pharmacists are temporary members, one of the latter is also a Doctor of Medicine

Takehiko Yuasa, director of the Sankyo Kabushiki Kaisha and the president of the Tokyo Drug Manufacturers' Guild Takaoki Sasaki Doctor of Medicine, head physician at the Kyoundo Hospital Kametaro Kawai, Doctor of Medicine, president of the Japan Pharmacists' Union

The following are secretaries, five are physicians

Atsuki Shiramatsu, head of the medical affairs section, Department of Home Affairs Masabumi Ishio, Doctor of Medicine, engineer of the Imperial Hygienic Laboratory in Tokyo Mikiyoshi Ito, Bachelor of Medicine Chuzo Hata assistant professor of the Tokyo Imperial University and head physician of its attached hospital Seishi Takagi Doctor of Medicine and assistant-professor of the Tokyo Imperial University

The following are technicians and pharmacists

Jin Matsuo engineer in the Department of Home Affairs Tatsuo Kariyone Doctor of Pharmacy Unji Konno, Doctor of Pharmacy Kuchiro Yoneda, Doctor of Pharmacy Kakuji Ishifuku, Pharmacist Lieutenant-Colonel Shinta Shimizu Doctor of Pharmacy, Pharmacist Commander



Tri-State Window Display of Pharmacist Frank Nau, Portland, Ore

SCIENTIFIC SECTION

BOARD OF REVIEW OF PAPERS —*Chairman*, F E Bibbins, Glenn L Jenkins, John C Krantz, Jr., Heber W Youngken, L W Rowe, L W Rising, C O Lee, E V Lynn, W G Crockett

THE SULPHUR OINTMENTS AND THEIR ASSAY *¹

BY CHARLES E BRADY AND HENRY M BURLAGE ²

INTRODUCTION

The United States Pharmacopœia and the National Formulary recognize three ointments containing elemental sulphur in the sublimed form (a) Sulphur Ointment, U S P, which is a simple mixture of sublimed sulphur (15% by weight) and benzoated lard, (b) Alkaline Sulphur Ointment, N F, a more complex mixture of sublimed sulphur (20% by weight), K_2CO_3 , water and benzoated lard and (c) Compound Sulphur Ointment, N F, a still more complex ointment containing sublimed sulphur (15% by weight), precipitated $CaCO_3$, cade oil, soft soap and lard

Since the U S P and the N F serve as legal standards for maintaining the strength and purity of official medicaments it seems desirable to have a satisfactory assay for these three ointments

PROPOSED METHODS

Methods which oxidize the S to H_2SO_4 and subsequent precipitation with $BaCl_2$ test solution are tedious and difficult to apply to pharmaceutical preparations containing sulphur, especially the ointments Of the oxidation methods that have been especially applied to these ointments are those of Evers and Elsdon (1) The ointment is heated with a mixture of concentrated HNO_3 and Br_2 and the excess of the latter removed, diluted with water and the aqueous solution extracted with ether to remove the fat, or a mixture of Br_2 and $NaOH$ may be used to bring about the oxidation Both procedures are tedious and in general give low results

Simple methods employing organic solvents to separate the fatty material and other ingredients from the sulphur cannot be applied as sulphur is appreciably soluble in most organic solvents This has been proved by Henville (2) and substantiated by work done in our laboratories

Attention was, therefore, turned from the usual long oxidation-gravimetric methods to those involving volumetric procedure In 1932 Castiglioni (3) proposed the conversion of the sulphur contained in acetone extracts of rubber into thiocyanate by boiling with KCN solution under a reflux and evaporating to dryness and the thiocyanate determined by Shulek's method (4) in which the excess of cyanide is converted to glycol nitrile by formaldehyde and then determined by titrating with standard $AgNO_3$ solution in a solution acidified with HNO_3 Allport (5) investigated this method and found that it gave low results for ointments and modified the procedure by treating the sample with a reagent consisting of KCN (40

* Scientific Section, A PH A, Portland meeting, 1935

¹ Pharmaceutical Laboratories, School of Pharmacy, University of North Carolina, Chapel Hill, N C

² Professor of Pharmacy School of Pharmacy, University of North Carolina

Gm), and triethanolamine (90 cc) dissolved in H_2O (g s to 1000 cc) and refluxing in the presence of soft paraffin and pumice to convert the S to KCNS, adding 0.1N $AgNO_3$ and titrating the excess with 0.1N ammonium thiocyanate using ferric alum as an indicator

In 1934 Fleck and Ward (6) proposed the following method which they claim to be shorter than that of Allport's and is not affected by sulphates. The material is refluxed with a solution of Na_2SO_3 to convert the S quantitatively to $Na_2S_2O_3$ and the excess sulphite removed by the addition of HCHO and acetic acid and the thio sulphate titrated by 0.1N iodine solution using starch as an indicator. Soft paraffin is added as in the previous method to accelerate the reaction. Work in our laboratories did not substantiate the claims of Allport and of Fleck and Ward with regard to the accuracies and brevities of time claimed for their methods.

In 1933 Shulek (7) proposed a method for the determination of sulphur in sulphur-bearing drugs whereby the sample is treated with KCN in the presence of a small amount of H_2O and acetone converting the S into KCNS and after boiling with boric acid, the thiocyanate is determined volumetrically by the method of the same author (8). This investigator found that in slightly acid solutions alkali cyanides and thiocyanates with bromine water forms cyanbromide quantitatively according to the reaction $HCNS + 4 Br_2 + 4 H_2O = H_2SO_4 + 7 HBr + CNBr$, the latter compound being stable in acid solution. The excess of bromine is removed by the addition of phenol which does not react with CNBr in the course of 3-4 hours. Potassium iodide is then added which reacts with CNBr in acid solution to liberate iodine as follows $CNBr + 2 HI = HCN + HBr + I_2$. The latter substance may be determined by titration with 0.01-0.1N sodium thiosulphate using starch as an indicator. Our investigations show that this method could be used for the determination of elemental sulphur in ointments when modified as follows

"Weigh accurately into a small beaker (50 cc capacity) a sample of ointment equivalent to 0.02-0.04 Gm of S. Distribute on the sample about 0.2 Gm KCN add 8-10 drops of water and 15 cc acetone and evaporate to dryness at a temperature sufficiently high to melt the ointment. Repeat the process of warming with acetone and follow by subsequent evaporation twice, using each time 5 cc of acetone (or until all of the sulphur has been converted). Dissolve the residue in water and filter through a small filter. Heat the fatty material remaining in the beaker with 5 cc of water almost to boiling cool somewhat and pass the aqueous liquid through the same filter. Repeat this procedure 3-4 times. The combined filtrates are received in a 125 cc glass stoppered Erlenmeyer flask, add 1 Gm of boric acid and boil gently for 10 minutes. (If a clear filtrate is not obtained, add the boric acid first and in some cases 0.5 Gm coarse pumice may be necessary to accomplish this, boiling 10 minutes, filtering and washing the filter as described above.) Acidify the cooled solution (amounting to 50-60 cc) with 5 cc phosphoric acid (20%), add bromine water dropwise until the solution is distinctly yellow, add phenol (5%) until the solution is decolorized. Shake well and set aside for $\frac{1}{4}$ hour, add 0.5 Gm KI and allow to stand in the dark for $\frac{1}{2}$ hour, keeping the flask securely stoppered, and then titrate in the usual manner with 0.1N $Na_2S_2O_3$ using fresh starch solution as an indicator. (1 cc 0.1N $Na_2S_2O_3$ = 0.01603 Gm S)

EXPERIMENTAL

Samples used in the investigation consisted of Sublimed Sulphur, U S P, of a commercial sample of Sulphur Ointment, U S P (No 1), a sample of sulphur ointment prepared in the laboratory according to the official directions (9)

(No 1-A), alkaline sulphur ointment prepared according to the N F (10) (No 2), Compound Sulphur Ointment prepared according to the N F (10) (No 3) and a commercial sample stated to be twice the official strength for sulphur ointment (No 3-A)

TABLE I

Sublimed Sulphur U S P	Wt of Sample	Wt Found	% Purity
	0 0203 Gm	0 0201 Gm	99 01
	0 0205	0 0205	100 00
	0 0217	0 0216	99 54
		Av	99 52

TABLE II

Preparation	Sample No	Series No	Observer I Wt of S Found	Observer II
Sulphur Ointment (0 2 Gm = 0 03 Gm S)	1	1	0 0300 Gm	0 0303 Gm
			0 0304	0 0322
			0 0291	0 0284
			Av 0 0298	0 0303
		2	0 0303	
			0 0299	
			0 0296	
			Av 0 0299	
		3	0 0293	Grand Average of All Detns = 0 0299
			0 0301	
			Av 0 0297	
	1-A	1	0 0304	0 0318
			0 0284	0 0282
			Av 0 0294	0 0300
			0 0288	0 0311
			0 0296	0 0307
			0 0293	
			Av 0 0292	0 0309
			Grand Average of Series = 0 0298	
		2	0 0387	0 0390
			0 0398	0 0388
			0 0394	
Alkaline Sulphur Ointment (0 2 Gm = 0 04 Gm S)	2	1	Av 0 0393	0 0389
			0 0399	Grand Average of the Series = 0 0392 Gm
			0 0398	
			0 0388	
			Av 0 0395	

Compound Sulphur Ointment

(0.2 Gm = 0.03 Gm S)

3

1

0.0293

0.0295

0.0292

0.0302

0.0289

0.0295

Av 0.0291

0.0297

Grand Average of Series = 0.0294 Gm

3 A

1

0.0655

0.0663

Av 0.0659

SUMMARY

1 A modification of Shulek's volumetric method for the determination of Sulphur in drugs is proposed for the assay of the official sulphur ointments

2 The proposed method has been found to be applicable to the official ointments and is applied with promising results to samples of the three official ointments carefully prepared in the laboratory and to two commercial samples of which one was stated to be twice the official strength

BIBLIOGRAPHY

- (1) Evers N, and Elsdon, G D *Analyst*, 47, 199 (1922)
- (2) Henville, *Ibid*, 55, 385 (1930)
- (3) Castiglioni *Zeit analyt Chem*, 91, 32 (1932)
- (4) Shulek, E, *Ibid* 65, 433 (1925)
- (5) Allport, N L, *Quart J Pharm Pharmacol* 6, 431-435 (1933)
- (6) Fleck, H R and Ward A M, *Ibid*, 7, 178-181 (1934)
- (7) Shulek, E, *Pharm Monatsh* 14, 228-229 (1933)
- (8) Shulek E, *Z analyt Chem*, 62, 337 (1923)
- (9) United States Pharmacopœia X, page 416
- (10) National Formulary V, pages 269-270

A NOTE ON THE ASSAY OF MASS OF FERROUS CARBONATE *

BY JOHN C KRANTZ, JR, AND C JELLEFF CARR ¹

INTRODUCTION

Based upon the work of Scott (1) and Knop (2), Krantz and Vidal (3) suggested the use of diphenylamine as an indicator in the titration of Mass of Ferrous Carbonate with tenth-normal potassium dichromate. This suggestion was adopted by the Revision Committee of the U S P XI owing to the advantages offered by diphenylamine as an inside indicator, over potassium ferricyanide as an outside indicator.

The formation of the green chromic ion makes it somewhat difficult for the inexperienced worker to determine sharply the end-point of the titration. To obviate this difficulty, the present investigation was begun, with the aim to introduce the volumetric reagent, tenth-normal ceric sulphate solution, in place of the

* Scientific Section, A. P. H. A. Portland meeting 1935

¹ Department of Pharmacology, School of Medicine, University of Maryland

corresponding dichromate solution The use of ceric sulphate as an oxidizing volumetric reagent has been extensively studied by Smith (4)

EXPERIMENTAL

A sample of Mass of Ferrous Carbonate was prepared according to the directions in the U S P X The theoretical yield of ferrous carbonate in the mass is 41.5 per cent

This mass was assayed using potassium dichromate tenth-normal solution with diphenylamine T S as the indicator Using this method, the mass assayed above the theoretical amount of FeCO_3 , namely, 43.2 per cent This higher value is in conformity with the findings of Hartley and Linnell (5) who suggested that the oxidations occur in the following order ferrous iron-carbohydrate indicator Using tenth-normal ceric sulphate as the volumetric reagent, the mass showed the following percentages of ferrous carbonate 40.6, 40.4, 40.4, 40.5, 40.5, 40.3, 40.6 and 40.6 When the pure ferrous sulphate is titrated in the absence of honey and sugar, the results with the two volumetric reagents are identical

The results using ceric sulphate are closer to the theoretical amount of ferrous carbonate and the end-point is much sharper Ortho phenanthroline, an indicator recommended by Smith (4) in the titration of ferrous salts with ceric sulphate, gave satisfactory results and a strikingly sharp end-point

The following procedure is recommended

Dissolve about 1 Gm of Mass of Ferrous Carbonate, accurately weighed, in 15 cc of diluted sulphuric acid, add 10 cc of diluted phosphoric acid and 100 cc of distilled water Immediately titrate with tenth-normal ceric sulphate, using 0.5 cc of diphenylamine T S as the indicator Each cc of tenth normal ceric sulphate is equivalent to 0.01159 Gm of FeCO_3

CONCLUSION

Ceric sulphate solution has been advantageously employed in the assay of Mass of Ferrous Carbonate

REFERENCES

- (1) Scott W W, *J A C S*, 46, 1396 (1924)
- (2) Knop, J, *Ibid*, 46, 263 (1924)
- (3) Krantz, J C, Jr, and Vidal, M J *Jour A Ph A*, 14, 882 (1925)
- (4) Smith, G F, *Ceric Sulfate Vol I* "G F Smith Co, Columbus, Ohio (1926)
- (5) Hartley, F, and Linnell, W H, *Quart J Pharm and Pharmacol*, 7, 549 (1934)

STUDIES ON CUDBEAR *

BY E H WIRTH, L E MARTIN AND P G SODERDAHL ¹

Cudbear as a coloring agent for pharmaceutical preparations came into use about 1874 (1) and in spite of complaint involving principally its lack of uniformity, it has enjoyed considerable popularity Although the tincture was previously official, cudbear as such, did not appear until the N F IV, where it was defined as

* Scientific Section, A Ph A, Portland meeting, 1935

¹ University of Illinois, College of Pharmacy, June 1935

"A purplish red powder prepared from species of *Rocella*, *Lecanora* and other lichens" The monograph in the N F IV included tests for brazilwood, logwood and coal-tar colors, and allowed 35% ash No marked change was made in the N F V except that the maximum ash limit was placed at 12%

Various attempts have been made to replace cudbear with one or another of the synthetic organic dyes, the most favorable one being amaranth suggested by Morrison (2) who offers as his objections to cudbear, the hinderance in filtration, color changes in acid and alkaline solution, fading and lack of uniformity (3) The bulletins of the N F VI, however, show considerable controversy (4) over the replacement of cudbear with amaranth in N F formulas, the objections to change being that amaranth does not impart the same color as cudbear, it therefore being unwise to change the color of established preparations, that it is satisfactory, that no lack of uniformity has been observed, and that some states have regulations restricting the use of coal-tar dyes The controversy finally resulted in the committee voting for the retention of cudbear At the request of Chairman Gathercoal the studies published herewith were made in connection with the revision of the cudbear monograph

Earlier objections to the use of cudbear were based particularly upon the lack of uniformity of tinctures made from various lots Attempts by Gardner and Raubenheimer (5), Arny (6) and Beringer (7) to prepare extracts of cudbear for use in coloring pharmaceutical preparations did not meet with considerable success In the cudbear of that time it had been noted that sodium chloride (8) seemed to be present in many samples in considerable quantity Craig (9) among others reported the lack in uniformity in color, concentration and tint The N F IV seemed to solve the variation in the color of preparations colored with tincture of cudbear by substituting cudbear itself in the formulas It, however, still allowed 35% of ash which did not remedy the sodium chloride situation In the N F V the ash limit was reduced to 12% which then resulted in the disappearance of sodium chloride as a diluent

Cudbear belongs to that interesting group of dye substances, orchil, cudbear and litmus, which are commercially produced from various lichens, principally *Rocella* and *Lecanora* Beringer (7) (1912) mentions *Lecanora tartarea* of Northern Europe as the principal source Most of the present-day cudbear, however, is produced in the Canary Islands, Madagascar and on the African coast

Very little definite information relative to the manufacture of cudbear is available, the manufacturers apparently guarding their secrets rather closely In general, however, the lichens contain colorless glucosides (?), acids and ester-like compounds of orcin which upon oxidation in the presence of ammonia split first into orcin, a colorless compound and are then converted into orcein and other colored substances The variety of colored substances produced is rather considerable and is discussed at length by Beringer (7) Altering the source of the lichens or modifying the process and the alkali used produces different end products which result in the different commercial substances

Cudbear itself is usually produced by digesting the lichens with about three times their weight of solution of ammonia at 60° for from three days to a week, air being admitted as a considerable requisite The mixture assumes first a blue and subsequently a red color when the product is dried and ground

The problem then consisted (1) in studying the uniformity of cudbear, (2) in studying its quality and purity and finally (3) in establishing, if possible, standards to insure these points. To this end 16 samples were obtained from various sources representing in a fair degree the average cudbear on the market. The samples were as follows

Sample 1	U of I Pharmacognosy Museum	Sample about 40 years old
Sample 2	Local druggist's stock	Age and source unknown
Sample 3	Mass College of Pharm	Age and Source unknown
Sample 4	U of I Coll of Pharm Dept of Pharm stock	Purchased 1933 from a New York wholesale house
Sample 5	Local druggist's stock	Purchased 1929 from Chicago wholesale house No 1
Sample 6	Purchased from Chicago wholesale house No 2,	1932
Sample 7	Purchased from Chicago wholesale house No 3	Age unknown
Sample 8	Local druggist's stock	Age and source unknown, apparently old
Sample 9	State Ed and Research Hosp Pharmacy	Purchased 1931 from a New York wholesale house
Sample 10	State Ed and Research Hosp Pharmacy	Purchased 1933 from a Chicago wholesale house
Sample 11	Chicago wholesale house No 4	Received by them from foreign dealer "A" 1934
Sample 12	Chicago wholesale house No 4	Received by them from foreign dealer "B" 1934
Sample 13	Chicago wholesale house No 4	Received by them from foreign dealer "C" 1934
Sample 14	Chicago wholesale house No 4	Received by them from foreign dealer "D" 1932
Sample 15	Chicago wholesale house No 4	Received by them from foreign dealer "E" 1929
Sample 16	Southern Illinois wholesale house	1934

COLORIMETRIC VALUE

Since cudbear is employed solely as a coloring agent, a study of the colorimetric value of the samples at our command seemed the best way to determine their quality. The method suggested by Scoville (10) employing standardized solutions of inorganic chemicals as devised by Army and his co-workers (11) appeared well adapted to this purpose. The method is as follows

' Accurately weigh one gram of Cudbear previously dried over sulphuric acid, macerate it for 18 hours in 100 cc of a mixture of 3 volumes of alcohol and 1 volume of water, cooled to room temperature before measuring. Shake frequently and allow the drug to settle. To 5 cc of the clear liquid, accurately measured, add 15 cc of alcohol then gradually add distilled water to make 1000 cc and mix. Compare the color of this freshly prepared solution in Nessler tubes or in a colorimeter with the color of a standard color solution prepared as follows

Decinormal Cobalt Chloride	0.75 cc
Two hundredth-normal Potassium Dichromate	0.30 cc
Ammonium Carbonate T S	3.00 cc
Distilled water a sufficient quantity to make	10.00 cc

The color of the cudbear solution should not be less than that of the standard solution prepared above.

In carrying out the method the standard solution was set in the colorimeter (B & L Biological No 2400) at a depth of 20 mm. The cudbear solutions were adjusted to equalize the color field, and depth readings taken. Several readings (often by several observers) were averaged and recorded. Two macerations were made from each sample and are designated as "A" and "B". Factors were then calculated for each sample indicating its color intensity as compared with 1.00 =

the standard (Thus, a sample in which the depth reading is less than that of the standard will consequently have a factor larger than 1 00, it being stronger than the standard) Results are given in Table I

TABLE I

Sample No	Depth in Mm A	of Samples B	Average Depth in Mm	Factor
1	18 5	18 1	18 3	20/18 3 = 1 09
2	18 3	18 5	18 4	20/18 4 = 1 08
3	16 4	15 3	15 85	20/15 85 = 1 26
4	17 3	17 0	17 15	20/17 15 = 1 17
5	20 7	20 8	20 75	20/20 75 = 0 97
6	19 5	19 3	19 4	20/19 4 = 1 03
7	16 0	15 7	15 85	20/15 85 = 1 26
8	22 5	22 7	22 6	20/22 6 = 0 88
9	23 8	24 5	24 15	20/24 15 = 0 83
10	20 5	21 3	20 9	20/20 9 = 0 96
11	16 5	15 7	16 1	20/16 1 = 1 24
12	17 0	16 5	16 75	20/16 75 = 1 19
13	15 6	15 0	15 3	20/15 3 = 1 30
14	12 3	12 5	12 4	20/12 4 = 1 61
15	17 3	17 1	17 2	20/17 2 = 1 16
16	17 3	17 0	17 15	20/17 15 = 1 17

COMMENTS ON COLORIMETRIC RESULTS

(1) Color tints between samples and standard check fairly close, at least close enough to make a semi quantitative estimation of color. Slight variations in tint between samples may be due to variation in manufacture or in rare cases to the presence of added coloring substances. In the sixteen samples examined only one such variation was observed, and this was not great enough to materially affect colorimetric observation.

(2) The standard solution should be freshly prepared and should be used at once due to the volatilization of ammonia. The three component solutions used in its preparation, however, are stable, and may be kept as stock solutions. The Ammonia T S should of course, be kept tightly stoppered and the usual precautions involving the effect of ammonia on glass observed. The cobalt chloride and the potassium dichromate solutions should be standardized by the usual chemical means.

(3) Although the strongest sample (No 14) was twice that of the weakest (No 9) in colorimetric strength both were extreme as compared with the entire group. The surprising thing is that for a substance reputed to be so carelessly prepared, the results run astoundingly close. This suggested to us that the manufacturers were employing some means of keeping the color value of cudbear more or less constant. No reference to such a fact appears in the literature or any textbook at our command. Our color findings, however led us to make a microscopical examination of the cudbear samples with further surprising findings. These results appear elsewhere in this paper. Rather extended subsequent correspondence with foreign and domestic dealers in cudbear, however, substantiated our supposition. It seems to have been a known fact to them that for some time diluents have been used commercially.

(4) It will be observed that 12 samples (75%) ran above standard and 4 (25%) ran below standard. Of those above standard 8 or $\frac{2}{3}$ of them ran over 10% above standard, while of those below standard 2 or $\frac{1}{2}$ of them ran more than 10% below standard. The standard, therefore, as suggested by Scoville seems to be a fair one. Of the sixteen representative samples only two ran more than 10% below the standard.

SOLUBILITY

As a possibility for determining the quality of cudbear a solubility method suggested itself. Approximately 70% alcohol (the tincture menstruum) appeared to be the most likely solvent for such a determination. Solubility tests were run in

conjunction with the colorimetric determinations as follows After a small portion of the supernatant liquid had been withdrawn for the colorimetric tests from the 18 hour macerations, previously described, the balance of each was filtered through a tared filtering crucible, the residue being washed with 70% alcohol until the washings were colorless The residue was then dried at 100° and weighed, the weight obtained representing that portion of the 1-Gm sample of cudbear insoluble in 70% alcohol The results are given in Table II

TABLE II — SOLUBILITY

Sample No	Percentage of Residue Insoluble in 70% Alcohol		Average of A & B	Color Factor (Table I)
	A	B		
1	63 02	62 48	62 75	1 09
2	69 44	69 65	69 54	1 08
3	65 60	65 17	65 38	1 26
4	72 57	73 22	72 89	1 17
5	69 25	68 91	69 08	0 96
6	69 08	69 42	69 25	1 03
7	67 02	66 10	66 56	1 26
8	66 21	66 04	66 13	0 88
9	83 62	83 18	83 40	0 83
10	83 57	82 79	83 18	0 96
11	73 55	73 52	73 54	1 24
12	73 05	74 00	73 53	1 19
13	65 32	65 15	65 24	1 30
14	68 46	68 97	68 72	1 61
15	73 25	73 32	73 29	1 16
16	65 74	66 12	65 93	1 17

COMMENTS ON TABLE II

While it is true that some of the samples which run high in color value show a low percentage of material insoluble in 70% alcohol (e g, No 3 and No 13) and that some of the samples which run low in color value show a high percentage of material insoluble in 70% alcohol (e g, No 9 and No 10) it can readily be observed that there is no consistent agreement between colorimetric and solubility results Solubility results are therefore no criterion of the tinctorial value of cudbear A comparison of the results, however, does seem to indicate that there may be substances present in some of the samples which do not impart a color but still go into solution in 70% alcohol It is also interesting to note that between 62% and 83% of cudbear is insoluble in 70% alcohol

PURITY

As was previously pointed out the earliest foreign matter reported (8) present in cudbear was sodium chloride To eliminate this the N F V reduced the ash limit from 35% to 12% In order that our cudbear studies be as complete as possible ash determinations were run on the samples These appear in Table III

TABLE III — TOTAL ASH

Sample No	Percentage Total Ash		Av	Color Factor (Table I)
	A	B		
1	13 74	13 92	13 83	1 09
2	7 3	7 55	7 48	1 08
3	4 96	4 97	4 96	1 26
4	4 29	4 55	4 42	1 17
5	6 14	6 21	6 18	0 96

6	9 58	9 76	9 67	1 03
7	6 55	6 45	6 50	1 26
8	23 87	24 22	24 05	0 88
9	10 43	10 31	10 37	0 83
10	8 76	9 12	8 94	0 96
11	4 72	4 86	4 79	1 24
12	4 69	4 51	4 60	1 19
13	5 11	5 40	5 26	1 30
14	16 05	16 08	16 07	1 61
15	13 47		13 47	1 16
16	4 09		4 09	1 17

COMMENTS ON TABLE III

It will be observed that 75% of the samples run well under the N F ash limit of 12%. Only one sample (No 8) runs excessively above this limit. Samples 1 and 8 were definitely known to be of considerable age and therefore suspecting their high ash content to be due to the presence of salt, they were extracted with water and gave the customary microchemical tests for NaCl. Samples 14 and 15, however, gave only traces of chlorides.

Color factors have again been carried over from Table I. As is to be expected there is no correlation between ash and color value. *e g*, No 14 the sample of highest color value runs considerably over the ash limit while No 16 the sample lowest in ash is only average in color value. On the other hand, however, samples No 8 and No 9 do show high ash and low color value while No 3, No 11 and No 13 show low ash and high color value.

There is always a question as to the selection of an ash limit. The present limit of 12% is probably a satisfactory one. At least it is not severe since half of the samples examined ran under 6 5%.

MICROSCOPICAL

As was previously stated our colorimetric and other analytical results indicated that a microscopical examination of the samples might throw some light on the question of their purity. Such an examination was made, both the original samples and the residues from the (70%) alcoholic extractions being observed. As was to be expected with a substance of the nature of cudbear, the mounts showed considerable quantities of extraneous matter. The most surprising foreign substance found was potato starch, present in variable amounts in about half of the samples and indicating most conclusively that starch is being added as a diluent, presumably to regulate the color value. Since the starch was that of the potato (except No 13, which was wheat) this adulteration no doubt takes place abroad.

Several other tissue elements, not of lichen origin, were found in many of the samples, the most common being woody tissues and hairs (presumably from leaves). These apparently originate from plant parts either gathered with the lichens through carelessness or added intentionally to the lichen mass during or before treatment.

Hyphae from the subhymenial layer of the lichen are abundant in the mounts occurring occasionally as tissue fragments but more often torn apart and more or less broken. The hyphae vary considerably in length and are from 0 002 to 0 006 mm in diameter. In rare cases they show branching. Fragments of the undifferentiated pseudo-parenchymatous portions of the lichens may also be seen especially after clearing with chloral.

Most of the woody tissue appears to be of a dicotyl source, although coniferous wood was found in some samples. We were unable to identify the botanical source.

of either the woody tissue or the hairs. It is highly doubtful whether the woody tissue found was from brazilwood, logwood or other colored woods. It seems rather to be a local adulterant entering through carelessness, being often accompanied by fragments of various bark tissues notably stone cells.

The microscopy of cudbear presents some difficulties. The phloroglucin-hydrochloric acid reaction for lignin cannot be used since the lignified tissue present is already colored pink or reddish by the natural coloring principle of the cudbear. Attempts to remove this coloring principle were more or less unsuccessful. Alcohol will not extract it from the tissue elements. We were, however, able to reduce the dye to its colorless base with sodium hydrosulphite. This reagent, however, also removes the lignin and is therefore of no use in preparing the sample for lignin testing. Identification of woody tissue could be and was based upon the presence of its characteristic elements, tracheæ, tracheids, wood fibres and fragments of medullary rays. Mounts allowed to remain 12-24 hours in chloral became sufficiently clear to facilitate the study of these elements. For the sake of brevity the microscopical results are tabulated in Table IV.

TABLE IV—MICROSCOPIC

Sample No	Potato Starch	Woody Tissue	Hairs	Remarks	Color Factor
1	0	+	0		1.09
2	0	++	0		1.08
3	+	+	0	Both pine and dicot wood	1.26
4	+++	0	0		1.17
5	0	++	+	Hairs long, unicellular	0.96
6	0	++	0		1.03
7	0	+	0	Wood mostly pine	1.26
8	0	+++	0	Dicot and pine wood	0.88
9	+++	+	+++	Stone cells in groups, hairs unicellular, often in clusters	0.83
10	++	+++	+++	Hairs long, unicellular	0.96
11	0	+++	0		1.24
12	+++	+	0		1.19
13	++ (wheat)	0	+	Endosperm cells of wheat, cross cells of wheat bran	1.30
14	0	+	+	Few curved unicellular hairs, occasional stone cells	1.61
15	+	0	+++	Wavy unicellular hairs, stone cells in groups	1.16
16	+++	0	+		1.17
Explanation of figures			0 = absent		
			+ = present		
			++ = considerable		
			+++ = abundant		

DISCUSSION OF TABLE IV

The microscopical studies show that

(1) Where considerable potato starch is present (4, 12 and 16) the color value is fairly constant (about 1.17), except in No. 9 which appears to be grossly adulterated and is low in color value. Samples 4, 12 and 16 appear to be reduced to a definite color value.

(2) No. 13 is diluted with ground whole wheat.

6	9 58	9 76
7	6 55	6 45
8	23 87	24 22
9	10 43	10 31
10	8 76	9 12
11	4 72	4 86
12	4 69	4 51
13	5 11	5 40
14	16 05	16 08
15	13 47	
16	4 09	

COMMENTS ON TABLE

It will be observed that 75% of the samples. Only one sample (No 8) runs excessively above this limit to be of considerable age and therefore suspecting the loss of salt, they were extracted with water and given. Samples 14 and 15 however gave only traces of chlorophyll.

Color factors have again been carried over correlation between ash and color value. e. g. No 8 considerably over the ash limit while No 16, the standard. On the other hand, however, samples No 8 and No 3 No 11 and No 13 show low ash and high color.

There is always a question as to the standard which is probably a satisfactory one. At least it is under 6.5%

MICROSCOPICAL

As was previously stated our conclusion was that a microscopical examination of the tissue section of their purity. Such an examination of the residues from the (70%) of the tissue expected with a substance of the same nature. The considerable quantities of extraneous material found was potato starch, present in the tissue and indicating most conclusively that the material was used to regulate the color value. No 13, which was wheat) the

Several other tissue elements were found in the samples, the most common being cellulose. These apparently originate from the tissue carelessness or added into the tissue.

Hyphae from the substrate were occurring occasionally as they were broken. The hyphae were of varying diameter. In rare cases they were differentiated pseudo-parenchymatous after clearing with chloral hydrate.

Most of the woody tissue appeared to be from the wood was found in some samples. We were unable to

of either the woody tissue or the hairs. It is highly doubtful whether the woody tissue found was from brazilwood, logwood or other colored woods. It seems rather to be a local adulterant entering through carelessness, being often accompanied by fragments of various bark tissues notably stone cells.

The microscopy of cudbear presents some difficulties. The phloroglucin-hydrochloric acid reaction for lignin cannot be used since the lignified tissue present is already colored pink or reddish by the natural coloring principle of the cudbear. Attempts to remove this coloring principle were more or less unsuccessful. Alcohol will not extract it from the tissue elements. We were, however, able to reduce the dye to its colorless base with sodium hydrosulphite. This reagent, however, also removes the lignin and is therefore of no use in preparing the sample for lignin testing. Identification of woody tissue could be and was based upon the presence of its characteristic elements, tracheæ, tracheids, wood fibres and fragments of medullary rays. Mounts allowed to remain 12-24 hours in chloral became sufficiently clear to facilitate the study of these elements. For the sake of brevity the microscopical results are tabulated in Table IV.

TABLE IV —MICROSCOPIC

Sample No	Potato Starch	Woody Tissue	Hairs	Remarks	Color Factor
1	0	+	0		1.09
2	0	++	0		1.08
3	+	+	0	Both pine and dicot wood	1.26
4	+++	0	0		1.17
5	0	++	+	Hairs long, unicellular	0.96
6	0	++	0		1.03
7	0	+	0	Wood mostly pine	1.26
8	0	+++	0	Dicot and pine wood	0.88
9	+++	+	+++	Stone cells in groups, hairs unicellular, often in clusters	0.83
10	++	+++	+++	Hairs long, unicellular	0.96
11	0	+++	0		1.24
12	+++	+	0		1.19
13	++ (wheat)	0	+	Endosperm cells of wheat cross cells of wheat bran	1.30
14	0	+	+	Few curved unicellular hairs, occasional stone cells	1.61
15	+	0	+++	Wavy unicellular hairs stone cells in groups	1.16
16	+++	0	+		1.17
Explanation of figures			0 = absent		
			+	= present	
			++	= considerable	
			+++	= abundant	

DISCUSSION OF TABLE IV

The microscopical studies show that

(1) Where considerable potato starch is present (4, 12 and 16) the color value is fairly constant (about 1.17), except in No. 9 which appears to be grossly adulterated and is low in color value. Samples 4, 12 and 16 appear to be reduced to a definite color value.

(2) No. 13 is diluted with ground whole wheat.

(3) Where an abundance and a variety of foreign matter occur (9 and 10) the color value is usually low. Samples 9 and 10 also show a high residue insoluble in 70% alcohol (Table II) and No 10 is excessively high in arsenic. These particular samples may therefore be exceptions. Samples 13 and 14 on the other hand show some foreign matter and are high in color value.

(4) Woody and leaf tissue show no correlation with color value and appear to be present due to carelessness in collecting and treating the lichens.

(5) All samples contain some foreign matter or other, and it may reasonably be said that no such a thing as a 'pure sample' of cudbear can be found on the market. By a pure sample is meant one containing only lichen tissue and the oxidized color base.

(6) The addition of starch as a diluent, which seems to be extensively practiced, brings up the question whether such a diluent should be permissible. Both the Pharmacopœia and the National Formulary have in the past specified and permitted inert diluents for certain drugs. Starch is, of course, an inert diluent. If a color standard is to be established there will be a natural tendency to meet it but not to exceed it. If the object of the color standard be that of insuring a uniform drug a specified diluent should be permitted. If on the other hand, it be the object of the standard to insure the quality of the drug, no such diluent should be permitted and an effort should be made to prohibit within reasonable limit all foreign matter. The standard should then be placed high enough to insure care in manufacture and discourage dilution.

WOODY ADMIXTURE

Certain woods containing coloring principles seem to be suspected adulterants of cudbear. In the past several editions, the N F has included tests for brazil wood and logwood. It would seem, however, that adulteration with these and other colored woods whose habitats are far removed from those regions where cudbear is produced, would be of rare occurrence. Neither time nor authentic samples were available for a very extensive survey of this question. A few experiments, however, were made with the samples of dye-woods available to us. These consisted of logwood, *Hæmatoxylon campechianum*, brazilwood (Pernambuco wood), *Cæsalpina echinata*, hypericum, *Hypericum perforatum*, cam wood, *Baphia nitida*, fustic, *Chlorophora tinctoria* and red saunders, *Pterocarpus santalinus*. Five tests customarily applied to colored woods were employed using the powdered wood itself, cudbear and samples consisting of cudbear containing 25% of the admixed powdered wood. The tests were as follows:

(1) One gram of the comminuted material consisting of woody material or admixtures of woody material and cudbear was macerated in 100 cc of distilled water for approximately one hour and filtered. The color of the filtrate was observed. (The filtrate was used for the following tests.)

(2) Five drops of glacial acetic acid were added to 5 cc of the filtrate and (A) any color change noted. The mixture was then boiled for one minute and (B) any color change noted. Five drops of stannous chloride T S were then added and (C) any color change noted. The mixture was then boiled for one minute and (D) any color change noted.

(3) 2 cc of basic lead acetate solution were added to 5 cc of the filtrate and (A) the color change noted. The mixture was then acidified with glacial acetic acid and (B) any subsequent color change noted.

(4) 2 cc of lime water were added to 5 cc of the filtrate and the color change noted.

(5) 2 cc of a 10% aqueous alum solution were added to 5 cc of the filtrate and the color observed.

The results of the tests will be found in Table V.

COMMENTS ON TABLE V

A study of Table V shows that while many of the tests are fairly characteristic for the woods themselves, the tests are of doubtful value when the wood is mixed with cudbear. The purplish red coloring principle of cudbear often changes the end color reaction to such an extent as to mask

it entirely or at least to such an extent that it becomes indefinite. It would seem that their histologic characters might be more adaptable to the identification of these woods.

The present N F test (our Test No 2, D) states that logwood and brazilwood give solutions of a deep red color. While this is true for logwood, it is of questionable value for brazilwood. Several samples of brazilwood and Pernambuco wood available to us gave a final light red color alone, and an orange red color when mixed with cudbear. This final orange red does not differ enough from the light reddish brown obtained with cudbear to be distinctive.

Attempts to identify the woody material actually occurring in our commercial samples (see Table IV) as one or the other of these colored woods were not successful. The above tests when applied to these samples did not give positive results. As has been previously mentioned it is doubtful whether these colored woods are found as adulterants of cudbear in more than exceedingly rare cases.

All in all, however, it would seem that the question of the identification of the woody adulterants, both the colored woods and others, must be subjected to considerable further investigation before really dependable means for their identification can be established.

TABLE V—TESTS ON WOODS

Material	(1)		(2)		(3)		(4)	(5)
	A	B	C	D	A	B		
Cudbear	r v	o r	r b	r b	l r b	bl	r b	p o r
Logwood	d o r	y	o y	d p	d p	da bl	y b	p bla d r p
Brazilwood	o bf	y	y	l r	l r	la	l y	r y r b
Hypericum	o bf	y	y	r	r	la	y	d r y r
Cam wood	o y	y	y	o b	o b	y	y	y l y
Fustic	o	y	y	d y	d y	y	g y	d y l g
Red saunders	l y o	dec	dec	dec	l r	dec	dec	l y l y o
Cudbear + logwood	d r	o	o	d r	d r	bl r	b	p r b
Cudbear + Brazilwood	r p	d o	d o	o r	o r	la	o r	p r b
Cudbear + hypericum	r p	o b	o b	r b	r b	la	o	d p r r b
Cudbear + cam wood	r p	o r	o	d o	d o	la	o y	d p o r
Cudbear + fustic	r	o r	o r	d o	d o	r bl	o r	d r o r
Cudbear + red saund	p r	d o r	d o r	d o	d o	r la	l o r	d p d o b

Explanation of abbreviations: b brown bl blue bla black d deep da dark dec decolorized f fluoresce g green l light la lavender o orange p purple r red v violet y yellow.

ARSENIC CONTENT OF CUDBEAR

Several shipments of cudbear have in the past been denied entry into this country because of high arsenic content. There is no official arsenic standard for cudbear. This work was undertaken to determine the arsenic content of our samples of cudbear.

The samples for the Gutzeit Test were prepared according to the method outlined in A O A C, page 308, part d (12). After digestion and dilution to a definite volume a small sample was removed and the acidity determined.

The generator used was a modification of that given in Hillebrand and Lundell, page 219 (13). Test tubes 10 cm x 1.25 cm were constricted 6 cm from one end, and the end then blown out and fire polished, giving a hollow tube constricted 6 cm from one end. This was fitted to a one hole rubber stopper of such size that it fit a 60 cc wide mouth bottle. The tube for the mercuric bromide paper was 12 cm long and fitted with a rubber stopper. The lower (longer) portion of the tube contained fluted filter paper 8 cm x 3 cm soaked in 20% lead acetate solution and dried. The upper portion contained a roll of the same lead acetate paper well moistened with water and then plugged with cotton and the mercuric bromide tube.

The mercuric bromide strips were strips purchased from A H Thomas & Co., and soaked for one hour in 5% alcoholic solution of mercuric bromide, removed and dried.

The test was carried out according to A O A C, page 308, part 4. These agents were all tested and found to be arsenic free. Standards of 0.010, 0.015, 0.020, 0.025 mg As₂O₃ were run.

along with the unknowns each time a determination was made. The lengths of the stains were measured and graphed according to Thomas (14), in which the ratio of the individual length to the total length is plotted against the concentration. This method gives a straight line graph which eliminates the error due to the possibility of several curves being drawn through the same points as when the length is plotted against the concentration. After trial runs to determine the approximate concentration, a sample was chosen which would give a stain within the range of the standards.

Whenever the lower lead acetate paper turned yellow or dark blue the results were not recorded. It was noticed that uniform results could not be obtained when this occurred.

TABLE VI—ARSENIC CONTENT AS As_2O_3 IN PARTS PER MILLION

Sample No	Parts per Million	Sample No	Parts per Million
1	21.0	9	9.3
2	Insufficient for test	10	4325.0
3	13.0	11	93.0
4	1.73	12	2.0
5	35.2	13	1.24
6	78.6	14	Insufficient for test
7	47.7	15	Insufficient for test
8	Insufficient for test	16	0.25

Each result is the average of two or more samples. The accuracy of the Gutzert Method has been studied by Neller (15) and found to give an average deviation of $\pm 6.6\%$ from the mean of several determinations, approximately the same degree of accuracy is reported by Barnes and Murray (16).

The standard set for certain fruits is not over 1.4 parts As_2O_3 per million. A recent article by Holmes and Remington (17) gives the arsenic content of American Cod Liver Oils as being from 1 to 6 parts per million. Much of the marine life which we use as food contains varying amounts of arsenic. Shrimps contain up to 20 parts of arsenic per million. Norwegians have been taking as much as one ounce of cod liver oil per day without apparent ill effects. If such amounts are harmless in the oils, fruits and marine foods, then in a coloring agent such as cudbear where the actual amount of drug in the finished product is exceedingly small, an arsenic content up to 50 parts per million should be perfectly safe and possibly justified. It does seem, however, that arsenic is an impurity which enters through carelessness. In a communication from the Department of Agriculture we are advised that six samples received at New York late in 1934 ran 1.2, 1.0, 5.0, 1.0, 2.4 and 1.0 parts per million. It will also be observed that among our own samples several (4, 12, 13, 16) produced in 1933-1934 also ran low in arsenic. This seems to indicate that cudbear with a low arsenic content can be produced if necessary.

The choice of a standard, if it were advisable to establish one, could be based on an amount within the limit of safety as 50 parts per million, but since carelessness appears to be the reason for its presence in large amounts, a maximum of 10 parts per million would be our recommendation. We choose this standard because it would apparently be easy to meet, and would give a coloring agent which would impart practically no arsenic to the finished pharmaceutical preparation. It also corresponds to the arsenic content specified in the present arsenic test of the Pharmacopœia (18).

SUMMARY

The uniformity, quality and purity of cudbear have been studied. While the commercial samples examined exhibited a surprising uniformity in tinctorial value,

the examination disclosed that several had been intentionally diluted, the most common diluent being potato starch

(1) A colorimetric method for the determination of quality and a color standard are advised

(2) Solubility tests are of questionable value in estimating quality

The discussion of purity involves

(3) Studies on ash content which reveal that many of the commercial samples run well under the N F requirements

(4) Microscopical studies which indicate considerable adulteration both intentional (the addition of potato starch as a diluent) and unintentional (the presence of woody, bark and leaf tissues)

(5) The usual methods for the detection of dye woods do not give satisfactory results The presence of dye woods as adulterants of cudbear is, however, probably exceedingly rare

(6) The study of arsenic content reveals that many samples of cudbear have a considerable amount of arsenic present Those produced in 1933 and 1934, however, show a smaller content indicating that the presence of arsenic is probably due to carelessness An arsenic limit of 10 parts per million is tentatively suggested

REFERENCES

- (1) Wilder, Hans, *Am J Pharm*, 46, 299 (1874)
- (2) Morrison, S W, *Jour A Ph A*, 22, 1112 (1933)
- (3) Morrison, S W, *Bulletins of N F VI*, page 1115
- (4) *Bulletins of N F VI*, pages 687, 688, 725, 1390
- (5) Gardner and Raubenheimer, *Drug Circ* 55, 515 (1911), *Jour A Ph A*, 2, 51 (1913)
- (6) Arny, H V, *Ibid*, 2, 47 (1913)
- (7) Beringer, G, *Ibid*, 1, 820 (1912)
- (8) *Ibid*, 2, 52 (1913)
- (9) Craig, *Drug Circ*, 56, 189 (1912)
- (10) *Bulletins of N F VI*, page 1273
- (11) *Drug Circ*, 58, 131 (1914), *Jour A Ph A*, 12, 839 (1923), *Ibid*, 22, 956 (1933)
- (12) Association Official Agricultural Chemists, *Methods of Analysis*, 3rd Edition (1930)
- (13) 'Applied Inorganic Analysis,' Hillebrand and Lundell (1929)
- (14) Thomas, B D, *Ind Eng Chem*, 26 356 (1934)
- (15) Neller, J R, *J Am Off Agr Chem*, 12, 332 (1929)
- (16) Barnes, J W, and Murray, C W, *Ind Eng Chem, Anal Edn*, 2, 29 (1930)
- (17) Holmes, A D, and Remington, Roe, *Ind Eng Chem*, 26, 573 (1934)
- (18) *U S Pharmacopœia X*, page 428

THE DETOXIFICATION OF STRYCHNINE BY PENTOBARBITAL SODIUM *

BY EDWARD E SWANSON ¹

Clinically, Zerfas and McCallum (1) observed that sodium amytal detoxifies strychnine In animals, Knoefel, Herwick and Loevenhart (2), Dawson and Taft (3) and Haggard and Greenburg (4) reported that several barbituric acid deriva-

* Scientific Section, A Ph A, Portland meeting, 1935

¹ From the Lilly Research Laboratories Indianapolis

tives have antidotal action in strychnine poisoning Swanson (5) found that single effective doses by vein of sodium amytal antidotes $6\frac{2}{3}$ lethal doses of strychnine By small, effective doses, repeatedly injected at intervals as judged by the recurrence of strychnine convulsions, Barlow (6) with pentobarbital sodium and Swanson (7) with sodium amytal observed that 30 lethal doses of strychnine could be antidoted The purpose of this investigation is to ascertain definitely in experimental animals whether pentobarbital sodium in single, equivalent, effective doses detoxifies strychnine the same as sodium amytal

Rabbits were used in the experiments The minimal anesthetic dose of pentobarbital sodium, employed in 5 per cent solution by vein, was determined to be 25 mg per Kg and the minimal lethal dose 50 mg per Kg It is generally agreed that 0.6 mg per Kg injected subcutaneously is the fatal dose of strychnine sulphate in rabbits The procedure was the same as that used by Swanson (5), that is, the poison is injected subcutaneously, and a minimal anesthetic dose of the barbiturate is given simultaneously by vein or mouth—See paragraph under Table

TABLE I—DETOXIFICATION OF STRYCHNINE SULPHATE BY PENTOBARBITAL SODIUM

Without Barbiturates			Injected Intravenously Pentobarbital Sodium 5% 25 Mg per Kg			With Barbiturates Administered Orally Pentobarbital Sodium 75 Mg per Kg			With Barbiturates Administered Orally Sodium Amytal 10% 50 Mg per Kg			Administered Orally Sodium Amytal 150 Mg per Kg		
Number of Rabbits	Dose of Strychnine Mg per Kg	Number Died	Number of Rabbits	Dose of Strychnine Mg per Kg	Number Died	Number of Rabbits	Dose of Strychnine Mg per Kg	Number Died	Number of Rabbits	Dose of Strychnine Mg per Kg	Number Died	Number of Rabbits	Dose of Strychnine Mg per Kg	Number Died
3	0.3	0	5	2	0	5	1.0	1	5	1.0	1	5	1.0	1
6	0.4	1	5	2.5	3	15	1.25	5	15	1.25	5	15	1.25	5
5	0.5	0	5	3.0	5	2.5	4.0	15	1.50	6	2.0	2.4	2.4	2.4
6	0.6	4	5	3.5	5			15	2.0	11				
3	0.7	3												

As shown in the table, with 25 mg per Kg of pentobarbital sodium by vein the M L D of strychnine is 2.5 mg per Kg ($4\frac{1}{6}$ M L D's of strychnine) With sodium amytal (50 mg per Kg the minimal anesthetic dose) the M L D of strychnine is 4 mg per Kg ($6\frac{2}{3}$ M L D's of strychnine) By the oral administration of 75 mg per Kg of pentobarbital sodium, the M L D of strychnine is 2 mg per Kg ($3\frac{1}{3}$ M L D's of strychnine) The M L D of strychnine with equal effective doses of sodium amytal (150 mg per Kg by mouth) is 2.4 mg per Kg (4 M L D's of strychnine) Thus either by vein or by mouth in single equivalent, effective doses, pentobarbital sodium is not as efficient in antidoting strychnine as sodium amytal This difference is probably due to the difference in duration of action of these barbiturates With equal, effective doses of sodium amytal the duration of action is obviously longer than that of pentobarbital sodium Thus, during the critical period of strychnine poisoning, sodium amytal has a longer period of action or a more sustaining effect

CONCLUSIONS

- 1 Pentobarbital sodium has an antidotal action in strychnine poisoning
- 2 In single, equivalent doses pentobarbital sodium is less effective in strychnine poisoning than sodium amytal

REFERENCES

- (1) Zerfas, L G and McCallum, J T C, *Anesthesia and Analgesia*, 8, 349 (1929)
- (2) Knoefel, P K Herwick R P, and Loevenhart, A S *J Pharmacol & Exper Therap* 2, 397 (1930), 33, 265 (1931)
- (3) Dawson W T, and Taft, C H *Proc Soc Exptl Biol Med*, 28, 917 (1931)
- (4) Haggard H W and Greenburg L A *J Am Med Assoc* 98, 1133 (1932)
- (5) Swanson, E E, *J Lab & Clin Med*, 17 325 (1932)
- (6) Barlow, O W, *J Am Med Assoc* 98 1980 (1932)
- (7) Swanson, E E *J Lab & Clin Med*, 18, 933 (1933)

ASSAY OF LINIMENT OF CAMPHOR *

BY D A OVERBYE AND R E SCHOETZOW ¹

Various methods have been suggested for the determining of camphor in Liniment of Camphor

Mann (2) suggested counterbalancing two pairs of filter papers pouring 0.4 to 0.5 Gm of Liniment of Camphor on one pair and an identical weight of olive oil on the other pair. These two sets of papers were then to be exposed to the temperature of a hot air bath for about twenty minutes and again weighed to determine the amount of camphor present. Cook (3) found that heating at 100° C for three hours drove off all but about one-half per cent of the camphor and, therefore suggested adding about one half per cent as a correction factor.

Cowie and Dickson (4) ascertained that 20 Gm of camphor in 80 cc of olive oil measured 100 cc and that therefore, the volume and weight of camphor in the finished liniment were identical. They proposed to take the specific gravity of the liniment at 15.56° C place the weight equivalent to 10 cc in a beaker, weigh 8 cc of olive oil in a similar beaker and heat in a sand bath at 150° C for thirty to forty minutes, making a correction for the loss in the oil.

Lothuan (5) recommended placing the liniment in a shallow dish, such as the cover of a petri dish to a depth of about one-half millimeter. The dish was then supported on a copper ring and leveled on the water-bath to obtain a uniform layer. This was heated one hour and weighed. He found that further heating would cause a gain in weight of the olive oil while the oil, itself, under these conditions did not gain. This indicated that the oil was affected by the camphor and therefore he placed no reliance on correction figures.

Wallace and Plummer (9) found that cottonseed oil oxidizes faster when heated with camphor than when heated alone as determined by the refractive index, the saponification value and the iodine value before and after heating. They found it was necessary to heat cottonseed oil at 120° C for five hours to completely remove the camphor.

Kebler and collaborators (13) prepared a standard 20% solution of camphor in cottonseed oil and found the optical rotation to be plus 58.5 on the sugar scale in a 200 mm tube. In a series of determinations heating to 150° C to practically constant weight gave fairly concordant results with the polarimetric determinations. They stated that heating may give slightly high results due to the presence of moisture.

Miller (14) says best results are to be obtained in a flat bottomed platinum dish at 110° C for 90 minutes in a well ventilated oven.

Poe Lipsey and Vaughn (11) made a study of the U S P method for determination of camphor in Liniment of Camphor and found that the method gave consistently low results, due to the oxidation of the olein in cottonseed oil. Various kinds of dishes were used but none proved satisfactory.

Dowzard (1) made a series of gravimetric assays on Liniment of Camphor and determined the optical rotation of the samples in angular degrees in a 100 mm tube at 15° C. He then divided the rotation by the per cent of camphor found gravimetrically to obtain a factor whereby

* Section on Practical Pharmacy and Dispensing A Ph A, Portland meeting 1935

¹ Analytical Department of the Chemical and Pharmaceutical Laboratories E R Squibb & Sons Brooklyn New York

the observed rotation could be converted into per cent camphor. For the seven assays listed the average factor was found to be 1.962.

Cook (3) pointed out that a polarimetric method becomes complicated by the fact that a solution of camphor in olive oil shows a different specific rotation (plus 50.63°) from that exhibited by an alcohol solution (plus 43.52°) and that a correction must, therefore, be made.

Hund (6) determined that cottonseed oil showed no optical rotation and on accurately prepared 10% and 20% solutions of camphor in cottonseed oil found that at 13° C one per cent camphor showed an average rotation of 0.493° in a 100 mm tube. Per cent by weight is therefore found by dividing the reading in a 100 mm tube by 0.493. This gave fairly concordant results with the gravimetric method. Malosse (7) says that the specific rotatory power of camphor in olive oil increases with the dilution.

Von Friedrichs (8) studied the polarimetry of camphorated oil with reference to the oil used as a solvent. For liniment prepared with olive oil he derived the factor: Per cent camphor = $1.958 \times \frac{\text{Rotation observed}}{\text{Length of tube in decimeters}}$. Factors are also given for liniments prepared with other oils. He found that ordinary deviations of temperature were almost negligible.

David (10) suggested that 4.0 Gm of camphorated oil be placed in a flask together with 1 Gm of calcium oxide and 100 to 120 Gm of water and the mixture distilled until 60 cc of the distillate has been collected in a graduated cylinder. Twenty Gm of sodium chloride were added to the distillate and the condenser washed with ether collecting the ether in the same cylinder. Ether was added to about 50 or 60 cc and the mixture thoroughly shaken. An aliquot of the ether was then poured into a tared flask weighed and evaporated on the water bath and the residual camphor weighed. From this the per cent of camphor in the original sample was calculated. Lajos (12) reports a method identical with this.

In connection with current work on U. S. P. revision, an assay method has been proposed (15) in which the liniment is dried in an oven maintained at 110° C for two hours under a stream of carbon dioxide.

Work was undertaken to obtain comparative results by polarimetric and gravimetric methods. Dowdard's factor was used in the polarimetric work. The carbon dioxide method was followed as outlined in the "Bulletin of the Subcommittee on Organic Chemicals". A third determination was made in an electric oven at 110° C without carbon dioxide protection, controls being run on the oil of cottonseed used for the liniment.

	Polarimetric	Per Cent Camphor in Sample Under CO ₂ at 110° C	Exposed to Air at 110° C ¹
Sample No 1	18.44%	18.63%	18.25%
Sample No 2	19.19%	19.52%	19.02%
Sample No 3	19.66%	19.68%*	19.41%

* The actual figure was 20.74 but correction of 1.06 was necessary due to loss when the oil itself was dried.

¹ The results given for the assays exposed to air at 110° C are corrected for increase or decrease in weight of the oil used.

Twenty-eight samples of cottonseed oil were tested for volatile matter at 110° C under carbon dioxide for two hours, only two samples showed any significant change. The results were as follows:

1 0 01 % increase	8 0 04 % increase	15 0 03 % increase	22 0 002% increase
2 0 01 % loss	9 0 04 % increase	16 0 004% increase	23 0 08 % increase
3 0 81 % loss	10 0 05 % increase	17 0 02 % increase	24 0 085% increase
4 1 79 % loss	11 0 005% increase	18 0 015% increase	25 0 039% increase
5 0 02 % increase	12 0 04 % increase	19 0 02 % increase	26 0 068% increase
6 0 01 % increase	13 0 07 % increase	20 0 06 % increase	27 0 066% increase
7 No loss or gain	14 0 007% increase	21 0 09 % loss	28 0 065% increase

A known solution of camphor in cottonseed oil was made up in a glass-stoppered, tared Erlenmeyer flask, 103 8016 Gm of cottonseed oil were weighed into the flask and 25 9704 Gm of camphor were added to make 129 8520 Gm of exactly 20% Liniment of Camphor. The flask was tightly stoppered immediately after the addition of the camphor. The mixture was warmed gently (not over 40° C) and shaken until the camphor was completely dissolved. The weight of the flask and contents was then checked to determine possible loss during solution, a loss of 0 0123 Gm was found, but as this represented only 0 01% of camphor it was disregarded. Optical rotation of this liniment was then determined in a 50-mm tube at 25° C and found to be plus 5 07. The oil used in the preparation of the liniment had a rotation of minus 0 03 in a 50-mm tube at 25° C. Using Dowzard's factor this gave 19 91% camphor based on the rotation of the liniment. When corrected for the rotation of the oil, the result was found to be 20 01% camphor. By the carbon dioxide method at 110° C the prepared liniment showed 20 02% camphor, but a blank on the oil showed a loss of 0 13% making a net result of 19 89% camphor. Another portion heated in a glass evaporating dish at 110° C till no odor of camphor was discernible showed 19 30% camphor, but a blank on the oil corrected this to 19 92% camphor.

	Polarimetric	CO ₂ Method	U S P X Method
Liniment	19 91% camphor	20 02% camphor	19 30% camphor
Correction for Oil	plus 0 10%	minus 0 13%	plus 0 62%
Net	20 01% camphor	19 89% camphor	19 92% camphor

It is apparently necessary to run a blank on the particular oil used in any given Liniment of Camphor if an accurate assay is to be obtained.

REFERENCES

- (1) Dowzard, *Chemist and Druggist* 56 328 (1900)
- (2) Mann, Arthur W, *Proc A Ph A* 51, 630-631 (1903)
- (3) Cook, E Fullerton *Proc A Ph A*, 54, 637 (1906)
- (4) Cowie and Dickson, *Ibid*, 54, 637-638 (1906)
- (5) Lothian, *Ibid*, 54 638 (1906)
- (6) Hund, *Ibid*, 56, 91-92 (1908)
- (7) Malosse *YEAR BOOK, A Ph A*, 3, 201 (1914)
- (8) O von Friedrichs, *Ibid*, 7, 98 (1918)
- (9) Wallace and Plummer, *A J P*, 93 600-604 (1921)
- (10) David, *YEAR BOOK, A Ph A*, 17, 1115, (1928)
- (11) Poe, Lipsey and Vaughn, *JOUR A Ph A* 18, 580-586, (1929)
- (12) Lajos, *YEAR BOOK, A Ph A*, 18 429-430 (1929)
- (13) Kebler and collaborators, *JOUR A Ph A*, 6, 617-618 (1917)
- (14) Miller, *Ibid*, 6, 683 (1917)
- (15) Bulletin of the Sub-Committee on Organic Chemicals," U S P XI Revision page

335

"APOTHECARY SHOPS OF COLONIAL TIMES"

A compilation of scattered historical data published in pharmaceutical literature and other sources of the past few years and describing apothecary shops, proprietors and distinguished customers of colonial days. The oldest American apothecary shop still in existence and doing business is the Rau Pharmacy in Bethlehem, Pa. The oldest record of an apothecary shop in America (1646) is that of Wm Davies of Boston, Mass. This was probably the first store devoted exclusively to Pharmacy in America.

* Abstract of a paper before Section on Historical Pharmacy, A Ph A, Portland meeting 1935—by Millicent R. LaWall

TINCTURE OPIUM *¹

BY P L BURRIN AND F E BIBBINS

Tincture of opium that was made according to directions given in the United States Pharmacopœia (1) contained a very large amount of precipitate in a short time. *This precipitate continued to form even after aging and subsequent filtration.* A sample of such a product that had been aged and filtered several times during its manufacture was still so turbid that one could not see through a column of the liquid which was 20 millimeters in diameter. This sediment does not seem to adhere to the sides or the bottom of the bottle, but remains thoroughly suspended for a long time. The unsightly appearance of such a product will immediately suggest the desirability of a more elegant tincture.

The United States Dispensatory has the following statement regarding tincture of opium which has precipitated

"Laudanum when long kept with an occasional exposure to air becomes thick from evaporation of a portion of the alcohol and the deposition of solid matter. If given in this state, it often acts with unexpected energy, and death has resulted in infants from doses which would have been entirely safe if the tincture had been clear" (2)

The method of preparing tincture of opium as outlined in the French Codex (1908) is somewhat different than the U S P X method. The French tincture is manufactured by dissolving an aqueous solid extract of opium in 70 per cent alcohol. The solid extract of opium is prepared as follows. Opium is cut in fine pieces and macerated in distilled water. This is expressed, and a second extraction made. The two liquids are then combined and reduced to a soft extract on a water-bath. This extract is then dissolved in distilled water and filtered. The filtrate is again reduced to its former consistency (3).

In order to develop a method whereby the objectionable precipitate in tincture of opium might be eliminated, several experiments were tried. The results of quite a number of experiments can be reduced to three, which will properly illustrate the procedure.

The following formula was used

Granulated opium	100 Gm
Paraffin	50 Gm
Alcohol	200 cc
Water distilled, a sufficient quantity to make	1000 cc

The tincture was prepared by dissolving the proper amount of opium in hot water. We allowed this mixture to stand over night, filtered the liquid, and added water distilled *q s* to make 250 cc. This aqueous mixture was heated on the water-bath until it was reduced to about 150 cc. This concentrate was cooled, and paraffin added. The mixture was then heated just sufficiently to melt the paraffin, and the whole was thoroughly mixed. After the paraffin had solidified, the product was allowed to stand twenty-four hours. The pellicle of paraffin was pierced, and the liquid poured off. The paraffin was washed with sufficient dis-

* Section on Practical Pharmacy and Dispensing, A. Ph. A., Portland meeting, 1935

¹ From the Control Laboratories, Eli Lilly and Company

tilled water to make a total of 800 cc This liquid was filtered, and 200 cc of 95 per cent alcohol added This resulted in a fairly clear product

Tincture of opium made by this method after aging thirty days was clear One can easily see through 20 millimeters of the liquid

Sixty days' aging, with subsequent filtration, further improved the clarity of the product, and gave us a brilliant tincture

This procedure does not entirely inhibit the formation of the precipitate However, the precipitate that forms on the sides and bottom of the bottle was more or less of a scaly nature, and while it will flake off and mix with the contents of the bottle, yet it does not produce a turbid and unsightly tincture A product made by this method could be used in dispensing very easily, merely by decanting the clear portion

A further improvement on this formula can be made by changing the procedure slightly An example of such a formula follows

Granulated opium	100 Gm
Paraffin	50 Gm
Alcohol	200 cc
Water, distilled a sufficient quantity to make	1000 cc

The granulated opium was dissolved in about 200 cc of hot water, and allowed to stand overnight, filtered, and the filter paper washed with water *q s* to make about 250 cc

This aqueous mixture was then heated to 77-80° C, and kept at this temperature until it was evaporated to about one-half volume The paraffin was added to this, and allowed to melt The mixture was then thoroughly beaten and allowed to cool

After the paraffin had solidified, the pellicle was punctured and the liquid drained off The paraffin was washed with enough distilled water to make a total of 800 cc This was then filtered, and 200 cc of alcohol mixed with the filtrate

A portion was assayed, and the product diluted according to this assay A sample of this mixture after aging 7 days and then filtering had much less precipitate in it than one made by the regular U S P X method

A sample that was aged 30 days and then filtered showed improvement in the amount of precipitate thrown down upon longer aging

Sixty days' aging was found to further reduce this quantity of final precipitate

A sample of tincture that had been made by this method and aged sixty days showed only a very small amount of precipitate This precipitate adhered to the bottom and sides of the bottle as a hard scale, which could be shaken loose, but immediately settled to the bottom Therefore, such a tincture could be used for dispensing very conveniently, as the clear product could be decanted readily from any dispensing bottle

A tincture that was made according to the U S P X method contained a very thoroughly suspended and muddy precipitate which, even after long aging, did not allow a clear portion to be decanted

These two groups of experiments were followed by a third one, in which the same procedure was followed, except with a change at only one point At the

stage where the aqueous mixture of opium was reduced, the liquid was boiled for 15 minutes, and allowed to stand overnight, instead of being maintained at a temperature of 77° to 80° C. The result of this procedure was even better than the previous experiments. The amount of precipitate in this tincture was materially reduced, and at the end of eighteen months had not shown any further sedimentation. An assay on the clear supernatant liquid showed no loss in potency during this period.

This experiment was repeated with opium from several different shipments in order to be sure that such a formula would be adaptable to the material usually obtained in commerce.

It has been suggested by some that caramel should be added to tincture of opium as a coloring agent. In order to prove that this might have some effect on the resulting precipitate, samples of all experiments were colored with a small amount of caramel. The results of all such experiments performed were the same, namely, a small amount of additional caramel to any of these tinctures increases the amount of precipitate, or at least the character of its formation. In all cases in which caramel had been added to the tincture, these products showed a fine, well-suspended precipitate which had no tendency to coagulate, and was very easily mixed by shaking. It is interesting to note that the samples colored with caramel showed the same easily suspended, and muddy precipitate that is characteristic of the U S P product. Therefore, the addition of caramel is objectionable.

CONCLUSIONS

Since a tincture of opium made by the method outlined above is free from this large amount of light, muddy precipitate that is characteristic of the U S P product, we suggest that the formula for tincture opium U S P be modified slightly so that a product can be made which will remain clear for a considerable period of time. Furthermore, the use of caramel as a coloring agent causes an additional precipitate, which is undesirable.

REFERENCES

- (1) The Pharmacopœia of the United States Tenth Decennial Revision 400 (1926)
- (2) The United States Dispensatory Nineteenth Edition, 1280 (1907)
- (3) French Codex 438 (1908)

A STUDY OF COMPOUND CRESOL SOLUTION *

BY K L KAUFMAN¹ AND C O LEE^{2 3}

Compound Solution of Cresol was first made official in the U S Pharmacopœia VIII. It has been continued in the succeeding revisions with but slight changes in the formula and procedure.

As a germicide the use of cresol is attributed to German workers (1). The fact that it is soluble in a soap solution has led to its wide use in such preparations which are well known by the official titles and various trade names.

* Section on Practical Pharmacy and Dispensing A P H A, Portland meeting, 1935

¹ J K Lilly fellow, Purdue University School of Pharmacy, 1933-1936

² Professor of Pharmacy

³ Purdue University School of Pharmacy La Fayette Indiana

DIFFICULTIES WITH THE OFFICIAL FORMULA

Compound Cresol Solution has been regularly assigned to our students to make for a number of years. We have observed that they find it hard to prepare. Also that the formula of the U S P X is more difficult to make than that of the U S P IX. We have come to the conclusion that the present official formula is objectionable for the following reasons:

- (a) The time required for completing the reaction and effecting a solution is too long
- (b) Two alkalis are used where one is sufficient
- (c) Possible loss of cresol, and changes in the product due to continued heating necessary to complete the reaction

IMPROVED PROCEDURES STUDIED

As a result of our observations and experiences, with this preparation, we have sought to eliminate the major objectionable features in making it. In addition several other oils, having saponification numbers close to that of linseed oil, have been used in preparing the cresol solution. These have all been studied with respect to their phenol coefficient, surface tension, ease of manufacture, penetration power, and general appearance.

SPEEDING UP THE REACTION

The liquor was prepared according to each of the formulas of the U S P VIII, IX and X. From the standpoint of the time required the U S P IX formula was the most desirable. It contains but one alkali and permits the use of a small amount of alcohol which, we assume, catalyzes the saponification reaction.

In an effort to determine the accuracy of our assumption several samples were prepared in which alcohol was added in varying amounts and at various stages in the process. When no alcohol was used the time required for complete saponification was much longer.

An effort was also made to speed up the saponification reaction by substituting methyl alcohol and chloroform for ethyl alcohol. The last traces of chloroform were hard to remove and methyl alcohol proved to be no better than alcohol so the use of these was abandoned.

THE USE OF OILS OTHER THAN LINSEED

It has been repeatedly suggested that the use of any suitable oil be permitted in making compound cresol solution. Such liberties with the official formula would raise questions as to the uniformity of the finished solutions for which the Pharmacopoeia strives. Then too the germicidal value and other properties of the solutions made from the various other oils are unknown. For these reasons we concluded to study the effects of substituting other oils in the formula. Those used were expressed oil of almond, olive, corn, sesame, sunflower, peanut and soy bean oils. The saponification ranges of these are close to that of linseed oil which served as a control.

The results of our studies upon the compound cresol solutions made from these eight well-known fixed oils are given in Table I following. The samples were all prepared according to the formula and procedure which we have proposed later in this paper.

The results clearly indicate that any of the oils named yield good compound cresol solutions. The eight samples tested proved to be practically alike in all of the essential properties.

TABLE I

Sample No	Oil	Specific Gravity	Color	Effect of 1-250 Dilution	Phenol Coefficient * <i>B. Typhosus</i> <i>S. Aureus</i>		Penetration* 1-100 Dilution <i>S. Aureus</i>
19	Soy bean	1.026	Dark red amber	Slightly cloudy	2.40	1.75	None
35	Linseed	1.032	Reddish amber	Clear	2.30	1.80	0-0.2 mm
36	Olive	1.027	Amber	Clear	2.10	2.10	None
37	Peanut	1.027	Reddish amber	Clear	2.00	2.10	None
38	Corn	1.027	Light red amber	Clear	2.35	2.00	None
39	Almond	1.026	Light amber	Clear	2.65	2.45	None
41	Sunflower	1.025	Light red amber	Clear	2.30	2.00	None
42	Sesame	1.026	Light red amber	Clear	2.00	2.00	None

* The authors are indebted to Mr. F. L. Willis, Department of Biology, for the penetration studies, and to Mr. G. L. Baker, J. K. Lilly fellow, School of Pharmacy, Purdue University, for the phenol coefficients.

THE QUESTION OF SOY BEAN OIL

The use of soy bean oil in the manufacture of the official Compound Solution of Cresol has been urged by manufacturers (2), as well as independent workers (3). They have argued that it is much cheaper and makes a product which is, in every way, comparable to the official product. The opposition has argued that soy bean oil yields a product which is too viscous, unsuited to easy dilution, and which gelatinizes upon cooling in the absence of excess alkali, or when potassium hydroxide is used alone (4).

These claims led us to make a special brief study of soy bean oil. Seven samples of 125-cc quantities of Compound Cresol Solution, using varying amounts and mixtures of alkalis, were prepared. The formulas are given in Table II following. The official procedure was followed.

TABLE II

Ingredients	1		2		3		Formulas 4		5		6		7	
Cresol	62.5	Gm	62.5	Gm	62.5	Gm	62.5	Gm	62.5	Gm	62.5	Gm	62.5	Gm
Soy bean oil	37.5	Gm	37.5	Gm	37.5	Gm	37.5	Gm	37.5	Gm	37.5	Gm	37.5	Gm
Potassium hydroxide	9	Gm	10	Gm	11	Gm	12	Gm	7	Gm	5	Gm	2	Gm
Sodium hydroxide									2.13	Gm	3.45	Gm	5.51	Gm
Alcohol	1.25	cc	1.25	cc	1.25	cc	1.25	cc	1.25	cc	1.25	cc	1.25	cc
Water to make	125	cc	125	cc	125	cc	125	cc	125	cc	125	cc	125	cc

OBSERVATIONS

1. None of these preparations gelatinized upon being cooled to 15° C.

- 2 All dilutions, even up to 1-250 were clear except formula 1 which was deficient in alkali
- 3 The use of mixed alkalis proved to be of no advantage

The objections raised to the use of soy bean oil in this preparation were not supported by our observations

The problem of gelatinization which has been reported by several workers has also been encountered by us but we were able to trace the difficulty, in every case, to the use of inferior grades of cresol Good cresol of U S P quality gave no trouble

A PROPOSED NEW FORMULA FOR COMPOUND CRESOL SOLUTION

While we have worked with the various other oils, previously named in this paper, after the manner described for soy bean oil, details of observations and results will be omitted here Suffice it to say that all yielded Compound Cresol Solutions of very good appearance and quality As a result the following formula and procedure for this preparation is proposed

COMPOUND CRESOL SOLUTION

Cresol	500 cc
Oil (any fixed oil mentioned in this study)	300 Gm
Potassium hydroxide	80 Gm
Alcohol	10 cc
Water, sufficient to make	1000 cc

Procedure —Put the potassium hydroxide into 80 cc of water When solution is about three-fourths complete, add the alcohol and stir until solution is effected Add this solution to the oil which has been previously warmed to about 60° upon a water-bath, and stir gently When saponification is complete, as shown by testing with water, in the usual way, or by appearance, add the cresol, in small portions with stirring Finally, remove from the water-bath cool and adjust the volume to 1000 cc with distilled water

The new formula has proved to be a great time saver We were able to complete the preparation easily, within fifteen minutes which is much less time than the average person takes to prepare the official formula For this reason also the losses and changes due to continued heating are minimized Students in manufacturing pharmacy were able to compound this formula with ease and success

SURFACE TENSION OF COMPOUND CRESOL SOLUTIONS

The Committee of Revision of the U S Pharmacopœia is interested in setting up dependable standards for its preparations With respect to Compound Cresol Solution there is considerable interest in surface tension specifications for it In Table III, on page 970, are the relative surface tension measurements of two different dilutions of eight samples of cresol solution The samples are the same as those given in Table I

The dilutions studied were 0.5% and 5% by volume These were selected because they are near those dilutions commonly employed in using this product They were made up with quantitative procedure The measurements were made by means of a Cenco-du Noüy Precision Tensiometer The instrument was carefully checked and calibrated in accordance with the instructions accompanying it (5)

TABLE III
Compound Cresol Solution

Sample No	0.5% Solutions		5% Solutions	
	Observed S	T Temperature	Observed S	T Temperature
19	30 33	28 0 degrees	34 60	28 5 degrees
35	31 17	28 0 degrees	35 40	29 5 degrees
36	29 75	28 0 degrees	35 12	29 5 degrees
37	30 19	28 0 degrees	34 87	29 5 degrees
38	30 50	28 0 degrees	35 33	29 5 degrees
39	29 92	28 1 degrees	35 27	29 5 degrees
41	30 72	30 0 degrees	34 92	30 7 degrees
42	30 47	30 4 degrees	34 26	30 8 degrees

The observed surface tension readings are in dynes per centimeter and are given as relative values only. They are the averages of several measurements upon each of the dilutions.

In conclusion we wish to suggest that it is our belief that a solution so well known and widely used as is Compound Cresol Solution deserves to be made with considerable exactness. This can be done, by using high-grade chemicals, and refined technique. Reasonable standards for purity of the finished product could then be worked out.

REFERENCES

- (1) *Chem-Zig* 12, 186, through *Archiv f Pharmacie*, 226, 217 (1888)
- (2) Bull Subcommittee 12 U S P X " pages 9-10
- (3) Éwe, George Proc Penna Pharm Assoc, 41, 166 (1918), through YEAR BOOK, A PH A 7, 206 (1918)
- (4) "Bull Subcommittee 12, U S P X," pages 31 and 107
- (5) The Ring Method for Surface and Interfacial Tensions, "Bull 101, pages 15 and 18, Central Scientific Co "

THE HOSPITAL AND THE PHARMACIST *

BY H C MCALLISTER ¹

With the evolution of hospital care and group hospitalization in this country, it has become necessary for the institutions to give more efficient service at a lower cost to the patient than was formerly the case. This is true from a professional as well as an economical point of view. Many institutions, especially those doing some non-profitable work, find it difficult to meet the economic demands which are being made of them at present. It is with these conditions in mind that the following observations are recorded. It is believed that they will very probably apply to a majority of the hospitals of the Southeast, and may suggest a method of remedying some of the conditions met in dispensing medication.

Many of the smaller hospitals are still operating with a "Drug Room" method of dispensing under supervision of a graduate nurse, who has had no particular training in this work. She is assisted by student nurses who refill supplies or stock preparations kept on the wards, as well as compounding the simpler prescriptions written by the Visiting Staff. The prescriptions which are too complicated to be filled by the nurses are sent to an outside pharmacy. This system obviously has a few advantages.

* Section on Practical Pharmacy and Dispensing A PH A, Portland meeting, 1935

¹ Pharmacist, Watts Hospital, Durham, North Carolina

- (1) Supplies can be obtained at any hour of the day or night
- (2) The operating personnel is practically no expense to the hospital

The disadvantages are

- (1) Prescriptions are filled by unqualified persons with a great risk to the patient's welfare and the hospital's reputation. This is necessarily true where untrained, immature persons are allowed to refill stocks of potent drugs and compound prescriptions of a similar nature.
- (2) Supplies are often allowed to become exhausted due to lack of foresight on the part of student nurses, whose duty it is to keep up the want list. This impairs the service of the hospital greatly.
- (3) The students are usually rotated every four to six weeks so that when a student becomes proficient enough to manage the system she is replaced by a new student.
- (4) Such a method is very expensive for the quality of service obtained. The handicaps of such a routine could be enumerated in great detail.

The first suggestion is, of course, the employment of a pharmacist. The type and size of the hospital must be considered before any definite decision might be made that it can support a pharmacist. Some comparative information may be gained from the experience of an institution that has had the services of a pharmacist for one year. The rate capacity of this institution is 225 beds, and it has an average of from 125 to 150 patients per day. This is slightly larger than most of the hospitals operating without a pharmacist but it can be easily seen from the following outline that smaller institutions cannot only afford but profit by the services of one trained in the art of manufacturing and dispensing.

As an experiment this hospital employed a pharmacist who relieved the nurses of all of their duties connected with the dispensing of drugs. The duties consisted of refilling such stocks as were kept on the wards, filling prescriptions, ordering drugs and the preparations of intravenous solutions. Under the system then being employed the plan proved to be very time-consuming. The average number of patients at that time was about 135 per day and the attending physicians wrote special prescriptions on their morning and evening visits. Many patients were medical cases and the number of special prescriptions, averaging between thirty-five and forty per day, was disturbing. Due to these special prescriptions valuable time was consumed with the medications of a comparatively few patients.

The first step to eliminate this variety of prescribing was to compile a formulary. A list was prepared from the most useful prescriptions employed by the Visiting Staff including some preparations from the U. S. Pharmacopœia, the National Formulary and the Recipe Book. Special efforts were made to include those preparations which were counterparts of certain popular proprietary preparations. The list was presented to the staff for their consideration, correction and revision. Promotion of these formulary preparations was done when the members of the staff called at the Pharmacy for information about other preparations. In order to accomplish this purpose, tact must be exercised in order not to antagonize the physicians in attempting to substitute official preparations for proprietary remedies, one or two suggestions should be made at a time. In this manner a splendid spirit of cooperation can be established between the physician and the pharmacist. Some preparations worked out by the pharmacist for the particular needs of the hospital proved to be of special interest to the staff. This interest was further stimulated at staff meetings which are held once a month. Papers are read at these meetings

concerning the new preparations to be added to the formulary Usually two or three preparations of the same nature are presented at each meeting and the merits and demerits of each are discussed This serves to acquaint the physician with the particular item under discussion Only basic drugs or preparations were submitted at these meetings After the formulary had been in use for six months the number of special prescriptions was reduced to ten or fifteen a day This allowed several hours of extra time which could be devoted to manufacturing, replacing supplies, studying, etc It also saved much medication since special prescriptions when returned from the wards are discarded

Shortly after the formulary was introduced the hospital adopted a flat-rate charge Included in the flat-rate a definite sum was charged for the room and ordinary drugs, dressings, X-rays, laboratory work, etc The term ordinary drugs was construed to mean drugs contained in the formulary This proved to be most successful, since the physicians, interested in keeping the cost of hospitalization as low as possible for the patient, would use stock preparations when the ingredients of which were analogous to those of proprietary preparations The medication to the charity patients was limited to stock preparations as far as it was possible On several occasions it was found that the formulary was too limited in its scope and additions were made

After using the list for some months it was found to contain some preparations for which there were no calls These had found their way into the list because of their popularity elsewhere This would indicate that it is necessary to compile an individual list for the particular needs of the institution

Records were kept including (1) the number of times the "special preparations" were called for, *i e*, those preparations not included in the U S P or N F but those that had been used in the hospital or in other institutions, (2) the name of the doctor prescribing these preparations If the frequency of prescribing a certain preparation was below a definite figure in a justified period of time the attention of the physician ordering it was called to a similar preparation, which was contained in the formulary In this way it was possible to eliminate the rarely used preparations, and further standardize the prescribing There are certain types of medication for which the indications for use are seldom Consideration must be given to this type of medication lest it be deleted without warrant, due to its infrequency of use and to overlook this fact will defeat the purpose of much hard work

Some idea as to the amount saved in stabilizing the prescribing and by careful buying may be gained from the following

	1933	1934
Cost per patient day for drugs	\$0 1421	\$0 1138
Cost per patient day for misc	0 0304	0 0151
	<hr/>	<hr/>
Total cost per patient day for Pharmacy	\$0 1725	\$0 1289

If the cost of the pharmacy for 1934 is figured on the basis of the cost per day for 1933, a saving of 26 43% on operation is noted A comparison of the inventory of the two years adds to the total potential savings, since that of 1934 was about 50% over the inventory of the preceding year The cost per patient day considering this increase in inventory is reduced to \$0 1186 which indicates a total potential saving to the institution of 31 18%

The question of salaries arises in figuring the total cost of operating the pharmacy Under the old system one-half of the graduate nurse's salary was included in the cost of maintaining the pharmacy and the remainder was charged to nursing service Under the new system, the entire salary of the pharmacist, as well as that of the employee who did cleaning, etc., was charged to the Pharmacy The salary paid was based on the average paid in the community, and included full maintenance in the institution The hours spent in work were shorter than those of other pharmacists in the neighborhood

It is believed that these conditions will apply in varying degrees to every institution averaging over fifty patients per day, and that such institutions can well afford the employment of a pharmacist for the following reasons

- (1) Nurses are relieved to do nursing duties
- (2) Closer cooperation between the institution and the doctor can be secured
- (3) Dispensing is standardized and the welfare of the patient as well as the reputation of the hospital is protected
- (4) A pharmacist can operate the pharmacy at a lower cost (including salaries) than can a person untrained in the art of dispensing

THE VISIBLE PRESCRIPTION DEPARTMENT *

BY GEORGE W FIERO ¹

Probably the most modern development in retail pharmacy is the so-called "open front" or visible prescription department Not that the idea is particularly new (Horton & Converse, Los Angeles, have had a completely visible prescription department since 1920), but it is now becoming quite popular It is no doubt a step in the right direction, since it emphasizes the professional nature of the pharmacist, however, one should be sure of his step before making such a radical change

Numerous articles have appeared in the drug journals praising the visible prescription department Some pharmacists have placed their prescription department in the window so that it is visible from the street (1), others have a completely visible prescription department within the store (2) and others have a prescription department wherein the actual compounding of prescriptions is not completely visible (3)

Silsby (4) points out that the physicians he interviewed were unanimous in their disapproval of a prescription department in which the patient could see the actual compounding It is important that the pharmacist should have a good professional relationship with the physician, therefore, his opinion of this type of prescription department should be quite important In order to determine this opinion, a questionnaire was mailed to one hundred physicians The names of these physicians were not merely taken from a directory, but were obtained from several active prescription pharmacists (both open and concealed prescription departments) in various parts of Buffalo The list included the physicians who wrote the most prescriptions The result of the survey is as follows

* Section on Commercial Interests, A P H A, Portland meeting, 1935

¹ University of Buffalo, School of Pharmacy

Number of returns, 40, 40%

Favoring visible department, 14, 35%

Not favoring visible department, 36, 65%

Among the reasons given by those favoring a visible prescription department were "It will give an excuse for a general merchandise store to call itself 'Prescription Pharmacy,' anything which emphasizes the professional side of pharmacy is favorable, it raises the standard of the entire profession, it is not only educational, but shows that the pharmacist is a skilled professional man. The customers can see the care, time and skill which the pharmacist devotes in preparing a prescription, it will promote a greater degree of confidence and respect for the pharmacist. They can see that the prescription is not all water and they will be satisfied with the price charged. It will dispel the secrecy of a prescription, there is nothing which a pharmacist has to hide. It will incline the pharmacist to make up fresh solutions, rather than merely pour them from a stock bottle. The pharmacist must keep the prescription department clean and orderly."

Among reasons given by those not favoring a visible department were "If a simple drug is prescribed, the patient, seeing it compounded, will feel that nothing is being done and will lose confidence in his physician, seeing the prescription compounded will create distrust and loss of confidence in the physician. It would be disconcerting to the pharmacist, make him nervous and take his attention from his work, it would make the patient apprehensive and confused, seeing poison labels, narcotics, etc., would cause fearfulness. The laity is unable to judge the ability of a pharmacist, as they know nothing of compounding, some prescriptions require consultation with the physician. In some cases (e.g., solution of potassium iodide) the compounding is not in accord with the price, the public may lose confidence, if the pharmacist merely pours from one bottle to another, or, if he merely replaces the proprietary label with his own. Hand-filling of capsules and pills is not always helpful, patients know too much about drugs now, they endeavor to read their prescriptions and reading a proprietary label may lead to self medication. It is unwise to permit some patients to know what goes into the prescription, patients, seeing what goes into the prescription, may get a wrong idea of their ailments—if they see a bromide, they may arrive at a false conclusion, for this reason many physicians dispense some medicines. The department should always be open for inspection, but not visible. The patient may conclude from a prescription containing a proprietary preparation as a vehicle that he is getting a 'patent medicine'."

The results of this survey would indicate that the physicians are not in favor of an open front prescription department in which the actual compounding may be observed. Probably a more satisfactory arrangement would be to have a prescription department with the actual compounding not entirely visible to the patient.

REFERENCES

- (1) Fay, L. C. *American Druggist* May page 66 (1935)
- (2) Philip, W. Bruce, *JOUR A PH A*, 24, 224 (1935) Brooks, H. A. *Druggists Circular*, May, page 13 (1934), Milner, Louis, *Ibid*, September page 16 (1934)
- (3) McNulty, W. J., *Ibid*, November page 15 (1934), Moser, T. A., *Ibid*, March, page 14 (1934)
- (4) Silsby, J. N., *JOUR A PH A*, 24, 134 (1935)

A HISTORY OF DENTIFRICES ^{*1}

BY MARTHA E FOULK AND ELIZABETH PICKERING

The history of dentifrices is a striking example of the persistent marketing and use of preparations containing substances known by the medical profession to be harmful. The literature abounds in advertisements lauding dentifrices, and in medical criticisms of their ingredients. It is true that the most dangerous, for example, sulphuric acid for whitening the teeth and powdered glass as a powder, have fallen into disuse. Dentifrices constitute such a substantial proportion of the toilet preparations sold by pharmacists, and the latter, as well as the general public, are to day presented with such a multiplicity of conflicting statements regarding the various market products that survey of the ingredients used in previous centuries may be of interest.

The Council on Dental Therapeutics defines dentifrices as preparations (pastes, powders and liquids) which aid in the removal of debris from tooth surfaces. From almost the earliest recorded writings on the subject, dentifrices have taken these three physical forms. Such preparations were first used chiefly to whiten the teeth, that is to beautify, but even as early as the middle of the first century Damocrates, a Greek physician, considered cleanliness the indispensable condition for avoiding disease of the teeth and gums. In any case the covering or removal of unwholesome breath was undoubtedly an important object as practically all formulas included one or more perfumes or deodorant materials.

Powders were composed of a great variety of substances, usually insoluble and often abrasive or astringent in character. In the 19th century insoluble powders were considered objectionable because they tended "to accumulate in the space formed by the fold of the gum and the neck of the tooth, and thus present a colored circle." To hide this, many tooth powders were colored red with bole Armenian.

Pastes as made then were of the same fundamental composition as powders but altered by the addition of a gum or a "pasty" substance, or often by addition of a liquid such as honey, and were unstable. It was not until early in the 20th century that the modern stable tooth paste or dental cream, of very much more complex constitution, was produced.

Mouth washes were sometimes of very simple nature, such as wine, asses' milk, etc., but more frequently were composed of very many substances and thus recall the "shotgun" remedies of the early ages. The active ingredients appear to be without exception acidic or astringent. These preparations were often claimed to be effective in "strengthening" the teeth and were, therefore, probably also used in the treatment of diseases of the gums.

Throughout the Middle Ages these various forms of dentifrices changed but little, and their ingredients were usually of indefinite composition and often of doubtful efficacy, or injurious. A partial list of ingredients is as follows:

Magistery of Pearls, Dragon's Blood, mastik, myrrh, pineapple, flowers of pomegranates, spring-water, gum of guaiac, Peruvian balsam, aqua vulneraria, cinnamon water, spirit of cochlearia, powdered crab's eyes, orris root, cuttlefish bone, burnt roots of birthwort, white salts, honey,

* Section on Historical Pharmacy, Portland meeting, 1935

¹ Library, E. R. Squibb & Sons, Brooklyn, N. Y.

burnt land snails, unwashed wool burnt with salt, sal ammoniac, costus, pellitory, pepper, emery, talcum, pumice, alabaster stone, coral powder, burnt purple shell or ashes of the murex, burnt trumpet wheels, pennyroyal, sage seed, Saint John's bread, gall-nuts, ashes and powder of stag's horn, ashes of the heel of an ox, and of the feet of a goat, goat's milk, burnt eggshells, salt, powdered skin of the radish asses' milk, alum, cedria, burnt figs, burnt gypsum, verdigris, vinegar wine, meerschaum, nitre, burnt orris root, aristolochia and reeds, moschata, cubeb, juniper seeds, root of cyperus, rosemary leaves, cream of tartar, armenian bole

During the 18th and 19th centuries a greater variety of definite chemical compounds were incorporated in these forms of dentifrices. Also, in 1868, there appeared a "new and improved form of tooth powder," the tooth tablet. This was supplied in the form of a cake from which one tablet at a time, sufficient for one brushing, could be broken. Tooth soaps, made by adding about one-third by volume of powdered soap to an ordinary tooth powder, had their vogue toward the end of the 19th century. At this time, as a result of the search for a means of preventing dental decay and bad breath, the trend toward dentifrices and mouth washes having antiseptic properties developed.

It is our purpose in the following, so far as is possible, to classify early dentifrice ingredients according to their mode of action, and to show how the members of those classes varied from antiquity up to the end of the 19th century.

The use of abrasives is as old as dentifrices themselves. Chemically, abrasives have consisted usually of phosphates, carbonates, silicates and carbon but the form and sources of these compounds have varied greatly.

Ashes obtained by calcining bones or portions of animals were much used for several centuries. One of the favorites was the ash obtained by burning the head of a hare, mentioned alike by Hippocrates, Pliny and others. At times this was combined with the ashes of mice and substituted by the ashes of the heel bone of an ox, the teeth of a dog, stag's horn, etc. Ashes from such sources doubtless consisted chiefly of tricalcium phosphate, to-day considered too highly abrasive for use.

Probably the most effective abrasive substance, which appears to have been used but little, was the "very white glass, similar to crystal, powdered and mixed with spikenard," which Scribonius Largus, physician to Emperor Claudius, recommended. Pumice was likewise a constituent of the 14th-century powders of Gaddesden and of de Chauliac mentioned above. It was condemned as harmful by Berdmore in 1769 and by James in 1814, but it appeared as a constituent of a dentifrice marketed in this country as late as 1879, which was moreover claimed harmless by its maker. Ashes of vegetable products, mentioned below, would be like glass and pumice, of silicious character.

Vegetable substances that were "burnt" were used as abrasives in ancient times. Galen (131 A. D.) advised that teeth be rubbed with dried figs burnt and pounded with spikenard and honey. Charcoal or ashes of other vegetable products such as wood, tobacco, cigars, bread, etc., were frequently used during the 19th century and carbon or soot in admixture with salt and snuff was much used. Charcoal from such sources was usually thought harmful, but a dentifrice consisting of it and quinine (21) appeared in the French Pharmacopœia of 1866. Because of its chemical identity it is pertinent to note in this connection that Aristotle considered the diamond dangerous to keep in the mouth as it would inevitably crack the teeth. It is doubtful if he referred to this as a mode of cleaning the teeth.

Calcium carbonate in its several forms has been continuously used as a dentifrice from very early times, on account of its mild abrasive action and its value as an antacid. Hippocrates (430-377 B. C.) discusses the use of powdered marble or white stone, Pliny, burnt eggshells, de Chauliac (1368 A. D.), powdered sea shells.

Powdered cuttlefish bone, which consists chiefly of calcium carbonate, was an ingredient of a powder recommended by Gaddesden of Oxford, in the 14th century, by Guy de Chauliac (1300-1368), by Anton Nuck (1650-1692) and later by Ruspini in 1750. The French Pharmacopœia

in 1850 contained a dentifrice recommended by Canton containing cuttlefish bone and Sir Edwin Saunders, Court dentist to Queen Victoria in 1851, also recommended one containing it. Powders for general use, used in London in 1872, contained cuttlefish bone and small amounts of it may still be constituents of them to day.

Seventeenth century dentifrices often contained powdered red coral, as did the dentifrice included in the French Pharmacopœia of 1850.

Thereafter chalk was usually substituted and was frequently used alone. It was recommended by John Greenwood, dentist to George Washington, who wrote him as follows: "If your teeth grow black, take some chalk or a pine or cedar stick, it will rub off." In Philadelphia in 1784, when tooth brushes were not known, people rubbed their teeth with a chalk rag. In 1842 the English used a dentifrice consisting mostly of white chalk and the largest constituent of Dr. Bridge's tooth powder used in 1854 in Brooklyn was prepared chalk. Equal proportions of prepared chalk and orris root made a good dentifrice (1854). Chalk was the main constituent of Dr. Chapin Harris' dentifrice (1850), Sir Edwin Saunders', Dr. Brown's (1867) and several powders used in London in 1872. Further references to this ingredient are unnecessary—it is the most extensively used abrasive in present day dentifrices.

Salt was used by the Chinese, the Greeks and the Romans in dentifrices, and was mentioned by Paul of Ægina. Later Avicenna (980–1037 A. D.), Guy de Chauliac and Giovanni of Arcole included salt in their dentifrices. Table salt along with other saline substances was considered undesirable in dentifrices in 1814 and again in 1847. In 1902, however, Greve gave two formulas for dentifrices, each of which contained 70 parts of a saturated solution of sodium chloride and today sodium chloride is still recommended by some for regular use.

Toward the end of the 18th century, orris root was used extensively. Ruspini mentions it in 1750. It continued to be a constituent of dentifrices through the 19th century and was present in Dr. Bridge's tooth powder (1854), Dr. Chapin Harris' dentifrice used in Baltimore in 1850, Sir Edwin Saunders' powder and Dr. Brown's powder (1867). As late as 1898, Dr. Willoughby D. Miller, an American dentist who practiced in Germany, recommended a tooth powder containing pulverized root of orris. It does not now appear to be extensively used, but appears in some formulas.

Reviewing briefly the tendencies of change in this field, it will be seen that in ancient times very abrasive substances were used—such as silicates, tricalcium phosphates, etc., and that their dangers were likewise very early recognized.

During the 11th century, Avicenna (980–1037 A. D.) in his book "The Canon" said that hard tooth powders injured the dental substance and must be avoided. In 1769, Berdmore warned that dentifrices that whitened the teeth by mechanical grinding were always composed of pumice, emery or some other cutting powder and were extremely pernicious as they destroyed the enamel. However, when theories about the teeth changed, advice about the use of abrasives changed. In 1782 when many believed that the enamel of the teeth could be regenerated and it was of no consequence that it be worn away by the use of abrasives, a renowned surgeon, Theden, recommended the use of them.

After the excessive use of abrasives in dentifrices during the first part of the 19th century, they were condemned strongly toward the end as being the cause of decay and irritation. This was probably due to some extent to the work of James, who in 1814 experimented with abrasives by placing teeth in a vice and rubbing them with powders containing coral, pumice, emery, etc. He found that one hour's application of them with a brush removed the enamel from the tooth. He stated his results thus:

'From this fact we may ascertain pretty nearly the time required for the destruction of enamel under the daily use of powder. Suppose such dentifrice be used for 10 seconds each day, by this calculation, we see it requires but one year's perseverance in its use to ruin the teeth.'

Bell considered that frequently the cause of dental decay was the abrasion of the enamel produced by coarse, gritty materials in tooth powders. Burchardt (1898) also discussed the irritant effects of abrasives such as charcoal and pumice and recommended the use of precipitated chalk or of magnesium carbonate or hydrate.

Because the original purpose of dentifrices was to beautify, there were, among the earliest used preparations, many for the whitening of teeth by chemical means. Some of these were of unknown and indefinite composition, as for example, the excrement of the bat used by the Chinese.

in a powder The Emperor Huang-Ti, called the founder of Chinese medicine, who lived from 2698-2598 B C, described two powders for whitening teeth, both of which contained musk

The majority of whitening agents used have been acid in character One of the most harmless used in early times was vinegar—mentioned by Hippocrates (460-377 B C) and subsequently by others From Strabo we learn that the Cantabri and other peoples of Spain used to clean their teeth with old urine which was kept for the purpose in suitable cisterns

To Lazare Riviere (1589-1655), professor at the University of Montpellier, goes the doubtful credit of first suggesting sulphuric acid for this purpose "If the teeth be very dirty, sulphuric acid might be used pure, otherwise one mixed it with mel rosatum or with water" The present day whitening agents which consist of mineral acids such as hydrochloric, cannot, therefore, be considered original or unique

After such treatment it is not strange that toward the end of the 18th century acids fell into disrepute as ingredients of dentifrices Among the critics were Thomas Berdmore (1769), dentist to George III, and James of Boston (1814), both of whom stated in no uncertain terms that whitening dentifrices, without exception, owed their action to the presence of acid by virtue of which they destroyed as well as cleaned the enamel

Tartaric acid, first mentioned as an ingredient of dentifrices by Nuck (1650-1692) was later replaced by Ruspini (1750) by the less acidic potassium bitartrate, cream of tartar This was an ingredient of a dentifrice included in the French Pharmacopœia of 1850 and was present with an equal weight of powdered lactose in the acid dentifrice given in the same pharmacopœia of 1866 With respect to the earlier formula, the statement appears that this salt may ultimately injure the enamel

Although it was well recognized that its continued use would injure the teeth, chloride of lime appeared in dentifrices of this period and was recommended, in a mixture with 2 parts of powdered red coral, for brushing yellow teeth It was considered to have disinfectant and deodorizing properties

Toward the end of the 19th century, phenol was recommended by Frey as an ingredient of a dentifrice Benzoic acid was recommended by Miller in a dentifrice in 1898, tannic and benzoic acids and boro-benzoic acid by Greve in 1902

Ancient dentifrices, particularly washes, contained astringent substances and these were also sometimes included in powders Alum was one of the earliest used of such substances and was mentioned by Paul of Ægina (625-290 A D), by Scribonium Largus who recommended it rubbed on the teeth three times a month and by Rhazes (850-923) as a constituent of a cement to stop tooth decay It continued to be an ingredient of many dentifrices until late in the 19th century Myrrh was used for the same purpose during ancient times and in the middle ages Other astringents such as camphor tincture of rhatany and quinine sulphate came into use in the 19th century The last two still appear in formulas

Calcium carbonate as chalk was first used for its abrasive action but by the middle of the 19th century its value as a neutralizer of mouth acids was recognized For this purpose it was sometimes allowed to remain on the teeth over night

Blondeau, a pharmacist, is given the credit for introducing alkaline salts in dentifrices before 1836 A dentifrice of magnesium subcarbonate in combination with cocoa butter appeared in France in 1847, and preparations containing magnesia and magnesium carbonate, shortly after A suspension of magnesium hydroxide was recommended as an antacid in 1898

Another alkaline salt recommended at this time was sodium bicarbonate which is also to some extent still in use in antacid dentifrices

Soap came into use in the 19th century and has since been an important ingredient of creams and the subject of much controversy regarding its effects on the gums

It must be recognized that the application of dentifrices at the present time is far different than in previous centuries Although the relationship of cleanliness to tooth preservation was early recognized and Giovanni in 1484 recommended cleaning of the teeth after every meal, this practice was certainly not general Dental education among laymen and the general advance of hygienic knowledge has resulted in a great increase in care of teeth which are now brushed daily or

oftener by a large proportion of the population. The heroic treatment given by many of the older dentifrices was possible only because they were applied at infrequent intervals. Along with the change in frequency and mode of application have developed the modern dental creams and powders, better adapted by physical form and the character of their substituents to produce and maintain dental hygiene without injurious effects on the teeth or gums. These, it is true, contain in some instances the very abrasive and acid substances mentioned above but usually only when the product is to be used in certain special conditions and with the advice of a dentist.

During the first third of the 20th century the relative importance of the various types of dentifrices has undergone considerable change. Liquids or solutions have been sharply differentiated into those intended to whiten the teeth and into the antiseptic mouth washes. The first class, as always, was uniformly acid. Investigations have shown that many of these contain the mineral acids, hydrochloric and sulphuric, and are distinctly harmful to the teeth. Somewhat less objectionable are those which contain the organic or so-called fruit acids.

Mouth washes containing various antiseptic ingredients have been extensively advertised and sold but it is now recognized that only extremely active disinfectants can be expected to have any action on the mouth bacteria under the conditions of use. These preparations, however, continue popular for the purpose of improving the breath and removing that bad taste.

The modern toothpaste or cream, welcomed on account of its convenience, palatability and stability, rapidly became a best seller. The first preparations of this type contained the more severe abrasives recommended at the time, such as tricalcium phosphate. Other abrasives which have been considered are magnesium phosphates, calcium fluoride, barium sulphate, silica, calcium and magnesium sulphates, etc. These and many others have been investigated and the majority abandoned for various reasons. Experience has shown the consumer that extremely abrasive creams are not suitable for continued use. Generally chalk or precipitated calcium carbonate has satisfactory cleansing action without injurious effects on the enamel, and it is therefore to-day the polishing agent most frequently present in pastes intended for general use, as opposed to the abrasive creams intended for prescription use.

A good polishing agent, but chiefly valuable as an antacid, magnesium hydroxide or milk of magnesia first appeared as an ingredient of pastes in products sold locally in Detroit and San Francisco and soon thereafter in a nationally advertised cream. The insolubility of this base gives to creams containing it the ability to neutralize mouth acidity without conferring on them the high alkalinity of the earlier alkaline creams. Magnesia dental creams now comprise a most popular type of dentifrice.

The scope of this paper does not permit the discussion of numerous ingredients in addition to those necessary for stability, used in creams. Attempts have been made to render these antiseptic by the addition of strong oxidizing agents, such as peroxides or other compounds inherently bactericidal. Recalling the use of chlorinated lime in the past, potassium chlorate was at one time an ingredient of a popular toothpaste. In 1931 Chilson still considered it a common ingredient of pastes. Disinfectants are now, however, infrequently added to pastes, except for the pur-

pose of stabilizing the paste, it having been recognized that they, like washes, can hardly be effective in the manner applied

The tooth soaps common during the latter part of the 19th century declined in importance with the rise of the toothpastes and are now little in evidence. In spite of the extended controversy over its dangers and advantages, soap, however, has continued an important ingredient of dentifrices. Powders, so important during past centuries, became much less so after the development of pastes. It has been said that recently, especially during the last year, the sales of pastes have declined in favor of powders. According to a survey made by *American Perfumer*, however, sales of pastes still greatly predominate, the sales of powders in 1934 representing only about 8% of the total.

Modern dentifrices, in whatever physical form, are quite complex as compared to those of the 18th and 19th centuries, and indeed at times approach the complexity of those of the ancients. In contrast to them, the individual constituents of present dentifrices, particularly of creams, are as a rule necessary to the stability of the preparations.

The authors are indebted for the above facts to the books listed in the bibliography and to many others which contained no additional information.

REFERENCES

- Allen, Charles, "Curious Observations on the Teeth" (1687), Bale, London (Dental Reprints, No 1)
- Ambler, Henry L, "History of Dentistry in Cleveland, Ohio" (1911), Evangelical Association
- American Medical Association, *Lecture Memoranda*, "Dental Art in Ancient Times," lecture delivered at A M A meeting, Atlantic City, 1914, Burroughs, Wellcome Co, London
- Bell, Victor C, "Our Teeth How to Take Care of Them" (1901) Young American Publishing Co
- Bell, Victor C, "Popular Essays upon the Care of the Teeth and Mouth" (1894)
- Berdmore, Thomas 'A Treatise on the Disorders and Deformities of the Teeth and Gums' (1769), Exshaw, Dublin
- Bridge, M K, 'Budget of Receipts' (1854), Hogan
- Brown, J P H, "The Teeth Their Health, Disease and Treatment" (1867)
- Brown, Solyman, "An Infallible Method of Preventing Diseases of the Teeth, Mouth and Gums" (1839), Kelly, New York
- Bulkeley, J P, "Modern Dental Materia Medica Pharmacology and Therapeutics" (1910), Robinson London
- Burchard Henry H, 'Textbook of Dental Pathology and Therapeutics, including Pharmacology' (1898) Lea & Febiger Philadelphia
- Canton, Alfred, "The Teeth, Their Preservation in Infancy and Manhood to Old Age" (1851), Ballière, London
- Clark, Andrew, 'Practical Directions for Preserving the Teeth' (1825), Knight and Lacy, London
- Desirabode, M, "Complete Elements of the Science and Art of the Dentist," 2nd Ed Translated from the French (1847) ("Am Library of Dental Science," Vol 7), Am Soc of Dental Surgeons, Baltimore
- Greve, Christian H, 'Prevention of the Diseases of the Teeth and Mouth,' in "The Prevention of Disease" (1902), Constable Co, Westminster
- Guerini, Vincenzo, "A History of Dentistry" (1909), Lea & Febiger, Philadelphia
- James, Benjamin, "A Treatise on the Management of the Teeth" (1814), Callender
- Kanner, Leo, "Folklore of the Teeth" (1928), Macmillan
- Kleinmann, Friedrich, "Recept Taschenbuch für Zahnärzte" (1874), Felix, Leipzig
- Meredith, L P, "The Teeth and How to Save Them" (1872) Tegg, London

- Miller, Willoughby D, "Lehrbuch der Conservirenden Zahnheilkunde" (1898), G Thieme Leipzig
- Parsons, E, "Conversations on the Teeth" (1879)
- Percira, Jonathan, "Elements of Materia Medica and Therapeutics," 3rd Am Ed, Ed by Joseph Carson (1852), 2 vols, Lea & Febiger, Philadelphia
- Prinz, Hermann, "A Historical Review of the Evolution of the Therapeutic Concept during the Last Hundred Years," *Dental Cosmos*, 76, 97 (1934), No 1
- Prinz, Hermann, "Dental Materia Medica and Therapeutics" (1920), St Louis, Mosby
- Robinson, James, "The Surgical, Mechanical and Medical Treatment of the Teeth" (1846), Webster, London
- Taylor, J A, "History of Dentistry" (1922), Lea & Febiger, Philadelphia
- Thompson, T D, "Facts for People Relating to the Teeth" (1854), Mussey
- Thomson, Noel H, "Formulaire de Medicine et de Chirurgie Dentaires, Maladie et Hygiene de la Bouche et des Dents" (1895), Baillière, Paris
- Watson, John F, "Annals of Philadelphia and Pennsylvania in the Olden Times" (1909), Leary
- Wedgewood, J J, "Progress of Dentistry and Oral Surgery," 4th Ed (1885), Kimpton
- Weinberger, Bernhard Wolf, "Orthodontics an Historical Review of Its Origin and Evolution" (1926), Mosby
- White, James W, Comp, "Dental Materia Medica," appendix (1868), S S White, Philadelphia

CALIFORNIA FAIR TRADE ACT *

BY IRA J DARLING, M A, LL B ^{1 2}

The anti-trust law of California, passed in 1907, is popularly known as the Cartwright Act. In the act a trust is defined to include a combination to increase the price or prevent competition in the sale of merchandise or to fix any standard or figure, whereby its price to the public or consumer shall be controlled (Stats 1907, page 984, ch 530). Such a trust is forbidden and very severe penalties are prescribed.

Statistics are not readily available to show what attempts were made to enforce the California anti-trust law in the two years following its enactment, but it is doubtful whether it was ever sternly enforced in all its rigor.

In its original form the California anti-trust law absolutely forbade any kind of a price setting agreement. It was clearly based upon the economic theory that the general welfare would be promoted by free and unlimited competition. It was enacted at a time when it was believed that an industrial system saturated with competition would automatically result in well-equipped factories, an efficient system of distributing the manufactured products and room for an unlimited number of small retail outlets with an ever-increasing rate of turnover. The law of supply and demand was considered adequate to adjust prices. *Laissez-faire* was the slogan.

In some magical way the energetic California competition was to make it possible for all the retail outlets, the numerous small drug stores as well as the large ones, to have customers who had the purchasing power to maintain indefinitely a high rate of turnover with a healthy mark-up. Now these California customers were mainly people with pay envelopes, salary checks or those receiving incomes

* AMERICAN PHARMACEUTICAL ASSOCIATION, Portland meeting, 1935

¹ Member of the California Bar and instructor in Accounting and Laws of Pharmacy, College of Pharmacy University of California.

from rents or interest The amount received by customers in wages, salaries, rent and interest was not equal in amount to the selling price of the articles offered for sale It was not equal to the selling price, never has been, and the California Legislature, by the enactment of an anti-trust law could not make it equal The amount received in wages, salaries, rent and interest not being equal to the total selling price of the products offered for sale, some of them, obviously, had to remain unsold, and there was "overproduction," or, to state it more accurately, there remained the lack of purchasing power

Furthermore, the larger concerns who had reserves of capital and had access to favorable markets began cutting prices in order to get rid of their stock The small stores, of course, had to cut prices likewise to meet the competition, but many stores, especially the small ones, could not afford to take the loss and failed

When the California Legislature met in 1909 it was faced by the ever present and sorrowful fact that purchasing power did not equal selling price, and that good management and lusty competition had not succeeded in making it equal At that session the Legislature decided to reverse some of its economic theories in order to try to solve the chronic problem that has driven sales managers to early graves while production managers have been able to take merited vacations So, in 1909, there was adopted a sweeping amendment to the Cartwright act of doubtful constitutionality In part the amendment provided " No agreement, combination or association shall be deemed to be unlawful the object and business of which are to conduct its operations at a *reasonable profit* or to market at a reasonable profit those products which cannot otherwise be so marketed " (Stats 1909, page 593, ch 362) In other words, if a contract sets a minimum resale price, and it merely assures a reasonable profit, and if there is no other way of selling the product at a reasonable profit, then the contract is lawful But what did the Legislature mean by a "reasonable profit?" Similar words in a Colorado statute were held to be so vague as to be unconstitutional, in the opinion of the United States Supreme Court in 1927 (Cline vs Frink Dairy Co , 274 U S 445, 47 Sup Ct Rep 681) However, in the eighteen years intervening, the constitutionality of the 1909 amendment was not questioned by the California courts

If the "reasonable profit" amendment of 1909 was unconstitutional, then it is probable that the original anti-trust law remained in effect However, the California courts construed the anti-trust law as though the amendment were valid so as to permit contracts for what was claimed to be a reasonable profit

The anti-trust law of 1907, the "reasonable profit" amendment of 1909 and the several bulky volumes of fine-printed statutes since then had all failed to usher the hard working retail druggist of California into the golden land of eternal prosperity where red ink is unknown In 1931 the rate of turnover was not what it should be, it was hard to maintain a respectable mark-up Customers just didn't seem to buy enough goods at the proper prices Sometimes it was hard to pay the rent Many small stores resorted to bankruptcy and the bankrupt stock was bought up and sold by some of the inconsiderate chain stores at cut-throat prices, even below the wholesale price

The Legislature sought to remedy this situation in 1931 by the passage of the Fair Trade Act (Stats 1931, page 583, ch 278), which definitely abandons the "reasonable profit" test, and makes resale contracts legal regardless of whether or

not the price named is one that will render the buyer or seller a reasonable profit, or more or less than a reasonable profit, or none at all. Such contracts need not be limited to forms of business that cannot otherwise be conducted at a profit. The California Fair Trade Act provides in part

'No contract relating to the sale or resale of a commodity which bears, or the label or content of which bears, the trade mark, brand, or name of the producer or owner of such commodity and which is in fair and open competition with commodities of the same general class produced by others shall be deemed in violation of any law of the State of California by reason of any of the following provisions which may be contained in such contract

"1 That the buyer will not resell such commodity except at the price stipulated by the vendor

"2 That the vendee or producer require in delivery to whom he may resell such commodity to agree that he will not, in turn, resell except at the price stipulated by such vendor or by such vendee "

Perhaps the troubles of the retail merchant were over. Perhaps!

In spite of the Fair Trade Act of 1931, sad but stern history tells us that prosperity did not come to California in the two years following 1931. By the time the Legislature of 1933 met it was painfully evident that the Fair Trade Act had not ushered in an era of abundance. As far as the retailer was concerned prosperity was still "around the corner," and he had decided that the world was at least an octagon.

One trouble seemed to be that the contract signed by the manufacturer and retailer was binding on no one except the parties who signed it. There were many ways of evading the purpose of the Act.

A competitor of the person violating the contract could not take any action to enforce it. The contract could not be enforced by some one who had not signed it, unless it stated that it was made for the benefit of that person, and it could not be enforced *against* some one who had not signed it. It was simply a private arrangement between the contracting parties.

The California Legislature is very obliging. It never hesitates to correct the mistakes of earlier legislatures or to change its economic theories when necessity seems to demand it, provided, of course, that there is no powerful pressure-group with a well-organized lobby opposing the change.

The theory was advanced by the retail druggists' lobby and others that the Fair Trade Act needed some "teeth," that it should be made easier to wreak legal vengeance upon some one when a duly signed Fair Trade contract failed to get the desired results, that possibly the highway to retail prosperity could be made smooth by paving it with lawsuits!

In 1933 the Legislature amended the California Fair Trade Act by adding the following section:

'Section 1^{1/2}. Wilfully and knowingly advertising, offering for sale or selling any commodity at less than the price stipulated in any contract entered into pursuant to the provision of section 1 of this act, whether the person so advertising, offering for sale or selling *is or is not a party to such contract* is unfair competition and is actionable at the suit of *any person damaged thereby* " (Stats 1933, page 793, ch 280)

Thus it is seen that the 1933 amendment to the Fair Trade Act authorizes an action to enforce a contract between a manufacturer or a wholesaler and the

retailer against anyone who "wilfully and knowingly" violates it, even though the party had not signed the contract. The person bringing the action need not be a person who has signed the contract, but may be any person damaged by the breach thereof. The amendment appears to declare that a private price fixing contract entered into between a manufacturer or wholesaler and a retailer may take on a status approaching that of a law binding upon every one else who knows about it.

The constitutionality of the 1933 amendment has not been definitely decided. There is no Federal decision or other state Supreme Court decision in point because there is no other statute similar to the California statute to be construed. The cases that have arisen in this state under the Act have not yet been decided by the California Supreme Court. One of these cases is now before the Court but no decision has been rendered. There have been trial court decisions upholding the amendment and decisions declaring it unconstitutional. Notice will be taken of three decisions in the trial courts.

Since there is no direct precedent for the 1933 amendment the courts are not in a position to follow an established precedent, moreover, it is impossible for the attorneys before a court to prove positively what the effect of the amendment would be, for the simple reason that the fact does not yet exist. If the court can decide the case on neither proof nor precedent, then it must theorize. If so, the decision will depend upon the economic theories of the particular judge or judges who hear the case.

In each of the California cases the plaintiff was a manufacturer or distributor who had signed a Fair Trade contract with various retailers. However, in each case the defendant was a retailer who had refused to sign one of plaintiff's contracts and was selling at a price lower than that named in plaintiff's contracts.

In the case of *Max Factor & Co vs Clarence G Kunsman*,¹ decided in October 1933, by Judge Emmet H. Wilson of Los Angeles, it was held that the 1933 amendment violated both the California and the United States constitutions. The court considered the amendment an attempt to legislate under the police power, but held that the amendment had no reasonable and necessary connection with the public welfare. The court says,

'The right of the owner to sell his property at a price satisfactory to himself is an inherent attribute of the property itself,' and is within the due process clause of the Fifth and Fourteenth amendments to the Constitution of the United States.'

The court further states

'A legislative enactment undertaking to regulate useful business enterprises is subject to review by the courts with a view of determining whether it is a lawful exercise of the police power or whether under the guise of police regulations there has been an unwarranted interference with the constitutional right to carry on a lawful business to make contracts or to use and enjoy property.'

In summing up the case against the 1933 amendment the court says

'It necessarily follows that section 1½ of the Fair Trade Act is in violation of the Fifth and Fourteenth amendments to the Constitution of the United States and in violation of the Constitution of California, in that it deprives persons of their property without due process of law and without compensation it abridges the privileges and immunities of citizens it deprives them of the full and free use of their property it imposes an unlawful unnecessary and unreasonable restraint

¹ See text of opinion, *The Los Angeles News*, October 21 1933

upon the alienation of property and upon contracts, and it is an unlawful interference with private business. It is not a valid exercise of the police power and it is not for the protection of the peace, health, safety, morals, or welfare of the public" (*Italics mine*)

This decision is a good expression of the older economic theories relating to property and contract rights. The court takes the view that the public welfare demands hands off from private property and non-interference with business competition, at least so far as the retailing of cosmetics is concerned.

In *Weco Products Company of California vs. Sunset Cut Rate Drug Co.*,¹ decided in January 1934, by another Judge of the Superior (trial) Court, the amendment was held constitutional. The court did not devote very much space in its opinion to the knotty problem of "public welfare," not approaching that indefinite theory nearer than to say, "the legislative body is presumed to be guided by proper considerations of public policy." Most of the opinion is devoted to the argument that the amendment is valid on the theory that it was passed to protect the manufacturer or distributor, that is, to protect his system of contracts, good will, trade-marks, etc. The defendants by their conduct were inducing other people who had signed contracts to break them.

Parties to a contract traditionally have been given some protection against third persons coming in and inducing the other person to break the contract. But never before has it been held that mere price cutting by the third party was the kind of conduct which would make him liable. However, in no other case decided on the theory of protecting contracts against the actions of third parties has there been a statute declaring price cutting unlawful. In this state under the Fair Trade Act if the defendant's actions are unlawful, they are unlawful because of the statute and not because the contracts are injured. Therefore it would seem that the court's reliance upon the legal theory that the plaintiff has a right of action because of an unlawful invasion of his contract is not sound. It cannot be logically advanced that the breaking of the contract because of fear of competition is an unlawful invasion of contract right on the part of the third party competitor, unless it can be held to be constitutional for the Legislature to give private contracts the status of law which cannot be broken.

In the *Weco* case the court in its opinion barely referred to the "public welfare," and made no reference to the welfare of the retailers.

This case would not be precedent for the constitutionality of that part of the Act which states that "anyone injured thereby" can sue.

If the Supreme Court should decide that the manufacturer has property rights remaining to him in trade-marked articles which he can protect against any price cutting then he, but not the retailers, would have a legal remedy.

The last decision to be particularly noticed in this paper is the case of *General Cigar Co. vs. The Drug Market*,² decided in the Superior Court, in September 1934. In holding the amendment constitutional the court said, "It is in evidence before me that the underselling of branded and trade-marked articles has resulted in the bankruptcy of hundreds of small independent dealers, leaving in its wake unemployment and economic distress," and it "is a fair exercise of the police power

¹ See text of opinion, *West Coast Druggist* February 1934, page 8.

² See text of opinion, *The Los Angeles Daily Journal*, September 28, 1934.

" The court took the view that the amendment was enacted to aid the retailer directly, and indirectly to promote the public welfare

The older view of police power was that it extended only to public *health, safety and morals*. The court in the *General Cigar* case takes the newer view that the police power extends also to some field, as yet poorly defined, that is sometimes termed "public welfare," and sometimes called "economic welfare, public convenience and general prosperity of the community". In support of the view that the police power extends to the economic sphere the court quotes at length from the case of *Nebbia vs New York* (March 1934), 291 U S 502, 54 Sup Ct Rep 505

If the law making body within its sphere of government concludes that conditions or practices in an industry make unrestricted competition an inadequate safeguard of the consumer's interests produce waste harmful to the public, threaten ultimately to cut off the supply of a commodity needed by the public or portend the destruction of the industry itself, appropriate statutes passed in an honest effort to correct the threatened consequences may not be set aside because the regulation adopted fixes prices reasonably deemed by the legislature to be fair to those engaged in the industry and to the consuming public "

The *Nebbia* case clearly shows that the police power now extends to economic affairs, but it must be noted that the prices in the *Nebbia* case were fixed by the government itself

As an additional ground for upholding the 1933 amendment the court in the *General Cigar* case advances the following theory " where the goods are well advertised and branded, a manufacturer has an interest, or concern, if you like, in those goods which are identified by his marks and advertisements " The court places great weight on the New Jersey case of *Robert H Ingersoll & Bro vs Hahne & Co*, 89 N J Eq 332, 108 Atl 128. New Jersey passed a statute making it unlawful to "discriminate against (a trade-mark) by depreciating its value," etc., except where the goods did not carry a notice forbidding such practice. The plaintiff marketed a popular brand of watch bearing a notice and trade-mark, the notice being construed by the court as a contract. The notice or contract provided that the retailer was licensed to use the *trade-mark*, etc., provided the watch were not sold for a price other than \$1.35. The retailer could remove the notice and *trade mark* and sell the watch at any price that he chose, but without removing the trade mark and notice this particular defendant offered the watches for \$1.00. The court held it unlawful for the defendant to do so, and held the New Jersey statute constitutional. But it is to be noted that the New Jersey contract did not set a price on the *article itself* as do the contracts authorized by the California statute. Possibly some courts would be inclined to distinguish between the two statutes.

It will be very interesting to read the opinion of the California Supreme Court, and ultimately an opinion from the United States Supreme Court.

The court says, in the *General Cigar* case, "It is a matter upon which only the opinions of the highest court in the state and nation can be of practical interest to the litigants, their counsel and the commercial world in general ". In the meantime, we must be guided—and confused—by the decisions of the trial courts, and since these decisions are in direct conflict one with another, we can only guess what the law will ultimately prove to be.

Will a judicial opinion upholding the validity of the 1933 amendment to the Fair Trade Act solve the problem? At their best such contracts are very difficult

and expensive to enforce¹ One user of Fair Trade contracts plaintively writes "We cannot sue 200 or 300 retailers Frankly, the legal expense is beyond our means"²

Possibly, after all this legal travail, many retailers will place slight reliance on Fair Trade Acts, amendments, injunctions, voluminous briefs and learned but conflicting judicial decisions We find editorial reference to the "universal complaint of Fair Trade manufacturers that retailers are not showing enough interest in the Act to return contracts, and the lack of support of Fair Trade items by retailers, the apparent divided opinion on the part of manufacturers regarding the advisability of refusing to sell retailers who do not sign Fair Trade contracts"³

There is no provision in the Fair Trade Act that the minimum retail price named in the contract shall be high enough to insure a profit to the retailer

There is no requirement that products be sold to all retailers at the same price

There are many types of disastrous competition that cannot be reached by Fair Trade legislation It does not limit the *producing* units—factories, laboratories, etc, with duplicating machinery It does not limit the number of *distributing* units with their duplication of facilities Nor does it limit competition between substantially the same product under an unlimited number of trade names It does not limit the number of competing retail stores, as new stores are permitted to open at any time regardless of the public need for such stores

More sweeping legislation is needed to correct the difficulties confronting the retail druggist

THE PLACE OF COMMERCIAL SUBJECTS IN THE PHARMACY CURRICULUM *

BY NEAL B BOWMAN¹

No one will deny the fact that there is an ever-increasing trend toward specialization in almost every field of endeavor Therefore, it is not surprising to find that the drug business is concerned with various proposals concerning its possible reconstruction This reconstruction was given impetus by the increase in course requirements and the demands brought about by changes in the business relations of the pharmacist, and the question suggests itself, "What is the place of commercial subjects in the pharmacy curriculum?"

Each teacher of commercial subjects, quite naturally with intellectual honesty, will champion his own subjects, feeling justified in so doing by virtue of the fact that he is the one charged with the responsibility of teaching those subjects

Society is so constituted that every member of it, after he has passed his

¹ Blumenfeld Juliet, *Retail Trade Regulations and Their Constitutionality*, 22 California Law Review, page 86

² L B Laboratories, Inc, "An Open Letter to the Druggists of California," *West Coast Druggist* April 1935, page 17

³ *West Coast Druggist* July 1934 page 12

* Section on Commercial Interests, A PH A, Portland meeting 1935

¹ Assistant Professor of Economics and Commercial Pharmacy in the School of Pharmacy of Temple University, Philadelphia Pa

formative period, takes up a certain phase of its activity, which constitutes his vocation. Hence, one of the important needs of the individual is preparation to perform his vocational tasks efficiently, because they represent the largest part of his work in life. This preparation might come partly by placing the individual in his industrial environment at the same time that he is pursuing his studies. But of the higher vocations, like pharmacy, which demand the exercise of the highest powers of the mind, experience cannot be left wholly to the apprenticeship system, but rather should it require an extended period of special theoretical education.

Teachers of commercial subjects are faced with the very important problem of integrating and correlating the various commercial interests into a composite whole with such a synthesis of content as will develop the very best offering. The work offered should be designed to "bring education down to earth and make it vital in its application to living." Or, to put it differently, the subject matter should be so patterned as to vitalize practical education.

The difficulties of the problem have been augmented by a very definite realization of the fact that business itself moves so swiftly, and assumes such a multiplicity of forms, that the mere exigencies of curriculum planning make it very difficult to keep pace with business. These are rushing, tumultuous times. The tide of world affairs runs high, trifles and petty worries and hurries hem them in on every side. Never has there been a greater need for an understanding of business institutions, their functions and their influence on the social structure. Never before has there been such a need for building in the minds of those who will control business a consciousness of proper ethical business conduct as right now.

Add to this the further fact that students for whom the subjects are intended have changed. If the capacities and potentialities of the students have been carefully analyzed the teachers are faced with the realization that the average student has limitless ambitions—he is hungry and insatiable for life with its rich experiences and sensations. He has freshly awakened interests, all of which represent an influence that may no longer be denied.

The satisfactory departmentalization of subject content is also perplexing, for the most part. Those who are charged with the evaluation of subjects taught should be schooled in the relative usefulness and uselessness of certain subjects in terms of student needs. A critical analysis of college catalogs will disclose the fact that the commercial subjects now offered bear a very definite relationship to contemporary business requirements of the pharmacist. Were free choices manifested, some students would, in all probability, elect certain subjects in preference to others, or they would evaluate subjects in terms of personal likes and dislikes.

Carrying this idea a step further, there might be some students who, with measured dignity, assume that the subject of Advertising should find no place in the curriculum since they have been nurtured in the belief that it is unethical to promote one's activities. But the majority of the students are cognizant of the statement, "To the man who never heard of you, you don't exist." Professionally, a graduate might be the town's best pharmacist—commercially, he might own the town's less frequented place of business. Granting that some do know the pharmacist and his qualifications, the value of constantly keeping his name before the public is vouched for in the biblical exhortation, "A new King grew up who knew not Joseph." The subject of Advertising teaches one how to seek public favor, and how to hold it as

well as to win it. The old bromide—"the public will make a beaten path to your door" is still a workable theory.

Some students, steeped in tradition, might join forces with those who, because they are not gifted with an analytical mind, would voice their disapproval of any sort of Accounting on the grounds that it would never be necessary to know any of the principles and practices because they don't intend to spend their time "keeping books." Accounting forces one to face facts. It has disciplinary value—it trains in construction and exercise. It teaches self-reliance, necessitates truthfulness, encourages neatness, stimulates resourcefulness and develops self-control.

Many students share the opinion that Salesmanship cannot be taught. Salesmanship can be taught and from a broader point of view than merely that of preparing for the selling of goods. The thought can be emphasized that all persons are salesmen and that characteristics which constitute successful salesmanship are as applicable to the profession of pharmacy. Special attention can be given to the importance and development of character. Salesmanship has been defined as "Selling goods that won't come back to people who will come back" and the definition has just as much significance to selling of prescriptions and professional services.

The same influence which might cause a student to be intellectually uncongenial to the other subjects mentioned might condemn Merchandising on the basis of the subject being too broad and general to justify the time spent studying it. Years ago intensive merchandising was as unnecessary as it was unknown, but to-day, merchandising, or aggressive "store-keeping," as it is sometimes called, must be in tune with modern trade practices. To-day pharmacy is more than a profession, it includes a business of modern merchandising.

The drug store is now beginning to be a crystallization point of innumerable human wishes, wants, desires and needs. The modern pharmacy is a typically American institution which has evolved to meet these demands. With its varied activities, covering a multitude of services in addition to its primary health aspect, the American pharmacy has come to fill an integral function in our community life, which though it may overlap with that of other institutions in part, is nevertheless largely unique. Pharmacy to-day is competing with many trade outlets. The social evolution of the pharmacy offers an interesting commentary on modern civilization, and it could well be termed one of the most important nerve centers for up-to-date merchandising. To-day the pharmacist is forced to merchandise the front of his store as well as to professionalize the rear of it. He is forced to handle many items heretofore, perhaps, not in keeping with the policy of conducting a pharmacy and the pharmacy has become, in a few strides, "the greatest service station in the world"—an integral part of the distributive system of the community. No matter how it may alter in superficial form, the pharmacy, in all probability, will remain the best agency to minister to the many miscellaneous wants of both the sick and the well, young and old, rich and poor, all creeds, all colors, every day and all day. The pharmacist is really the purchasing agent for the community he serves. His interests are varied and his problems are multiple.

It seems idle to condemn the multifarious activities of the pharmacist of to-day, or to suggest a return to the old days when the pharmacist adhered to the strictly limited field of compounding and dispensing of prescriptions and proprietary remedies. Though such a move would enable a greater "professionalism" of the phar-

maceutical industry, in the limited sense of the term, it would also involve a decided social and economic loss on the part of the community

Current changes in economic conditions indicate that current changes in business education are imminent. The subject matter and teaching techniques of the various courses in the commercial field should not be bookish, abstract and artificial. It is imperative that the work and methods of the class room parallel as far as possible the actual conditions of the business world of which the students are integral parts. Careful planning on the part of the teachers and whole-hearted co-operation on the part of business leaders will bring about the necessary revision. Business education must remain flexible, and subject to modification in the light of existing conditions in the community. It might be mentioned, at this point, that the writer is now engaged in a project which is designed to study practices in Commercial Pharmacy curricula in order to learn to what extent the Commercial Pharmacy curricula and courses are in conformity with the actual requirements of practicing pharmacists, as evidenced by personal interviews with employing pharmacists in selected and representative districts of Philadelphia and its environs.

The business teacher who has kept in touch with tendencies in the field is fully aware of a real need for general business education in the schools of pharmacy. He must not cling tenaciously to old ideas nor must he go to the other extreme and impulsively adopt each suggested innovation. The efficiency in knowledge of the subject matter must not only be tested but rather the ability to use and apply the underlying principles of the subjects of business as tools of learning and for shaping judgment in matters of everyday experience. Naturally an impelling and abiding interest in the commercial subjects must be created. Should not the commercial teachers hold the demands of business in as high esteem as the demands of the professions?

One cannot read the daily press or converse without meeting a situation which requires a background of business behavior. Because the whole social life is so interwoven with business activities, one needs an understanding of these activities and their effect on the social and political life in order to understand and interpret the happenings of contemporary living.

It is the opinion of the writer that the commercial subjects have a very definite place in the pharmacy curriculum and should not be mitigated in the least. He maintains the point of view that the main objective of commercial training is to augment, *not supplant*, the professional training of the student and thus better fit him for profitable employment after graduation. For surely, "They profit most who serve best."

"THE ASSAY OF ORGANIC MEDICINAL PREPARATIONS CONTAINING ARSENIC"

Presenting a brief review of the available methods for the estimation of arsenic in organic compounds. The details of the various methods are classified for the purpose of making a comparative study of the analytical procedures. The tendency toward improved technique is noted while the difficulties encountered in applying a number of details are also indicated. Suggestions are offered, on the basis of experimental data with the idea of developing greater uniformity in a practical and dependable method for the assay of organic arsenicals, particularly those containing pentavalent arsenic.

* Abstract of a paper before Scientific Section A PH A Portland meeting 1935—by Edward J. Hughes

THE DEPARTMENT OF THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY

C B JORDAN—CHAIRMAN OF EXECUTIVE COMMITTEE, A A C P, EDITOR OF THIS
DEPARTMENT

The paper by Professor Dunn adds valuable data to promote progress in teaching Botany and Pharmacognosy. Such information should be presented to Pharmacy students for their guidance, and guidance of students is important, especially with beginning students—C J ZUPALL

A STATISTICAL STUDY OF THE RECORDS OF THE SAME CLASS IN BOTANY AND PHARMACOGNOSY

BY MARIN S. DUNN *

We have always believed that a close relationship exists between the quality of student work in botany and that in pharmacognosy. However, we have lacked definite quantitative studies to support our view, and it was for the purpose of obtaining these that the following analysis was made, using the records of one class of one hundred and twelve students taking botany and pharmacognosy in successive years (1930-1931) (1931-1932). The final grade in botany represents the average of three or four examinations and two note-book inspections while that in pharmacognosy the averages of quiz grades, note-book and five examination grades.

From the crude scores of the same class in botany and pharmacognosy arranged in simple series, the cases have been regrouped for each examination, quiz and note-book into group series with an interval of five. Then from these, the central tendency as represented by the median, mean and mode, the first and third quartile points, the range of the first quarter, middle fifty per cent and fourth quarter, the quartile deviation and the standard deviation have been computed. Lastly, the correlation from simple series between the final grades in botany and those in pharmacognosy has been worked out using the Pearson formula.

$$r = \frac{\sum xy}{\sqrt{\sum x \sum y}}$$
$$P.E. = \frac{6745 \times (1 - r^2)}{\sqrt{N}}$$

The results are given in Tables I and II (Turn to page 993)

DISCUSSION

Casual observation of Examinations I and II in botany would lead one to believe that the class contained many good and many poor pupils with a few average ones. As a matter of fact, as proved by their later records, the reverse is the case, there were a few extremely good pupils, a few extremely poor, and the rest average. Many students who were just above the passing grade of 70 in their examinations in theoretical botany and pharmacognosy were able to pull their final average to the

* Professor of Biology at the Philadelphia College of Pharmacy and Science

eighty mark The means in botany hugged the eighty mark except in Examination IV which was taken principally by those whose grades were low enough to make this examination compulsory Often, students who barely passed botany found themselves continually in hot water in pharmacognosy However, other students who were doubtful in botany but passing, and beginning their study of pharmacognosy found new interest and pulled themselves out of the danger zone

The majority of the class, however, did about the same grade of work in pharmacognosy that they did in botany—some a little better and some a little worse

In pharmacognosy, the first examination was poorly answered by many of the students, Examination II was a little better, Examinations III, IV and V showed continuous improvement with the peak reached in Examination V where 25 students made between 96 and 100, 30 between 91 and 95, 25 between 86 and 90 (Table I) From a wide distribution of marks, the field became more and more limited, except in the range of the first quarter where the low grades of a few absolute failures lent themselves to a wide distribution (Table II) The mean of the final grades in pharmacognosy was 79.8, the measure of the spread or variability 9.8

In the normal probability curve, 34% of the cases lie between the mean and $+1\sigma$, between $+1\sigma$ and $+2\sigma$ lie 14% of the cases, between $+2\sigma$ and $+3\sigma$, 2% of the cases In other words if σ is the standard deviation and is measured from the mean, between -1σ and $+1\sigma$ lie about 68% of the cases, between -2σ and $+2\sigma$ lie about 95% of the cases, whereas only about 27 of 1% of the cases lie outside of $\pm 3\sigma$

In our distribution curve in botany if we lay off on the base line distances of $\pm 1\sigma$, 2σ and 3σ from the mean, we find that 71% of the cases lie between -1σ and $+1\sigma$, and 98% between -2σ and $+2\sigma$ Only one case lies beyond -3σ Doing the same for pharmacognosy, we find 79% of the cases lie between -1σ and $+1\sigma$ and about 97% between -2σ and $+2\sigma$ Two cases lie beyond -3σ From the above, we are able to see that although our curves for botany and pharmacognosy do not coincide with the normal curve, yet they approach it rather closely

By the use of the Pearson formula, the correlation index of relationship from simple series between the final grades in botany and pharmacognosy calculated was found to be $+0.58 \pm 0.04$ This is about the same as the correlation of an average of elementary school marks with an average of first-year high school marks It denotes a substantial or marked relationship between the two sets of grades

There is a fair chance that a student doing average or better-than average work in botany will, under the same conditions probably do about the same kind of work in pharmacognosy, while a poor student in botany has the chances against him Of course, other factors play a very big rôle in student success Other things being equal, our data indicates the better the training in botany, the better the chances in pharmacognosy

Since there is apparently a definite positive correlation between work in botany and pharmacognosy, every effort must be made to give the student as fine a botanical foundation as possible Our study also shows there is a need for particularly careful teaching in the early months of study in both subjects—teaching which involves closer coöperation between student and instructor, especially in borderline cases

TABLE I—COMPARISON OF DISTRIBUTION FREQUENCIES OF THE SCORES MADE IN BOTANY AND PHARMACOGNOSY

	Botany							Pharmacognosy						
	Exam I	Exam II	Exam III	Exam IV	Note book I	Note book II	Final Grade	Exam I	Exam II	Exam III	Exam IV	Exam V	Note book	Quiz I
96-100	6	15	0	0	2	3	0	4	1	5	18	25	0	0
91-95	18	8	9	2	5	18	10	6	10	14	25	30	3	9
86-90	20	19	14	3	26	32	22	9	19	21	27	25	24	25
81-85	16	7	28	6	26	23	30	12	16	11	15	10	39	28
76-80	11	16	21	3	26	27	26	8	16	11	6	4	20	17
71-75	8	14	11	3	9	5	13	18	17	23	5	3	8	19
66-70	25	28	16	6	15	4	10	12	13	6	5	4	1	9
61-65	3	3	8	2	2	0	0	11	5	4	2	2	0	11
56-60	2	0	5	2	1	0	1	10	5	1	0	1	0	3
51-55	0	0	0	1	0	0	0	8	5	6	1	0	0	3
46-50	3	0	0	1	0	0	0	4	2	2	0	0	0	0
41-45	0	1	0	0	0	0	0	5	0	2	0	0	0	1
36-40	0	1	0	0	0	0	0	1	0	0	0	0	0	0
31-35	0	0	0	0	0	0	0	2	0	0	0	1	0	0
26-30	0	0	0	0	0	0	0	0	1	0	0	0	0	0
21-25	0	0	0	0	0	0	0	1	0	0	0	0	0	0
16-20	0	0	0	0	0	0	0	0	0	1	0	0	0	0
11-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6-10	0	0	0	0	0	0	0	0	0	0	1	0	0	0
0-5	0	0	0	0	0	0	0	0	1	0	1	1	1	0

TABLE II—COMPILED STATISTICAL DATA OBTAINED FROM STUDENT RECORDS IN BOTANY AND PHARMACOGNOSY

	Botany							Pharmacognosy						
	Exam I	Exam II	Exam III	Exam IV	Note book I	Note book II	Final Grade	Exam I	Exam II	Exam III	Exam IV	Exam V	Note book	Quiz I
Mean	79.9	79.5	77.8	74.2	80.3	84.3	81.0	69.6	75.7	77.8	85.6	88.2	81.3	78.9
Mode	68.0	68.0	83.0	83.0	83.0	88.0	83.0	73.0	88.0	73.0	88.0	93.0	83.0	83.0
Median	82.3	78.8	79.8	75.2	81.6	85.3	82.0	71.4	78.0	79.9	89.1	91.3	82.7	78.9
Q ₁	70.0	70.1	70.7	67.0	76.2	79.5	76.8	59.4	69.4	72.0	82.8	86.1	78.8	71.3
Q ₃	90.0	89.7	85.1	84.1	87.0	89.9	86.9	82.0	88.6	89.2	94.2	95.8	88.1	84.8
Range 1st Quarter	23.0	30.1	14.4	17.0	16.2	9.5	20.8	38.4	69.4	52.0	82.8	86.1	8.8	30.3
Range Middle 50%	20.0	19.6	14.4	17.1	10.8	10.4	10.1	22.3	17.2	17.2	11.5	9.7	7.4	13.5
Range 4th Quarter	9.0	10.3	8.9	10.9	11.0	8.1	8.1	17.0	13.4	7.8	5.7	4.3	8.9	9.3
Quartile Deviation	10.0	9.8	7.2	8.6	5.4	5.2	5.1	11.3	8.6	8.6	5.8	4.8	3.7	6.7
Standard Deviation	11.7	12.0	9.4	11.5	7.7	6.8	7.3	16.0	14.2	14.0	14.5	12.0	9.0	10.3
Coeff of Correlation	+0.58 ± 0.04													

REFERENCE

Symonds, Percival M., "Measurement in Secondary Education," The Macmillan Company, New York, 1930

AN ESPERANTO PHARMACOPŒIA?

The *Pharmaceutical Journal* of October 26th, states 'that a difficulty which would arise immediately in producing an international pharmacopœia—such as was suggested at the Brussels Conference—is the choice of language' Latin is obviously unsuitable for description and modern phraseology. Colin A. Barnes suggests that the international auxiliary language, Esperanto, be used, as this was adopted by the League of Nations some twelve years or more ago as the only practical language in existence for international use. Many scientific papers have already been published through this helpful medium, and there also exists a dictionary of international medical terms published in the language by one of the European countries."

THE SECTIONS OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

The abstracts of the minutes of the sessions held in Portland, Ore August 5 to 10, 1935 (see also brief summary in report, Final Session House of Delegates printed in the JOURNAL for August, September and October 1935) Titles of papers will be given in the Minutes, discussions if any, will be printed when paper is published if not included in the minutes The Editor will be thankful for correction of errors

Abstracts of a large number of papers were distributed at the meetings, some have been printed Abstracts of some papers are still obtainable by addressing the JOURNAL OF THE A P H A 2215 Constitution Ave Washington, D C

SCIENTIFIC SECTION

The First Session of the Scientific Section was called to order by Chairman E V Lynn August 7th, at 2 00 P M in Multnomah Hotel

The Chairman stated that the first order of business would be the Address of the Chairman during which First Vice Chairman, H M Burlage, presided The address follows

THE CHAIRMAN'S ADDRESS

BY E V LYNN

One of the pleasant duties which is every year expected of your chairman is that of extending greetings of the officers to the members and visitors It is with the most sincere feeling that these usual expressions are made to you to day The attendance may be low because of our distance from the geographical center, but our meeting can be of great interest and aid to all of us and it is urged that each contribute freely toward making this an especially successful session As is usual, any credit for the task of making arrangements has been due to our secretary and it is a great pleasure to make here public acknowledgment to the present, efficient incumbent of that office

During the past few years our progress and the volume of scientific literature which has been offered to us have grown to unusual proportions As has frequently been pointed out in previous sessions, there was a time when we needed to beg for contributors in order to make creditable use of our time The objective of each set of officers year after year was to build up an organization by this means which would do much for pharmacy in the way of comprehensive and meritorious research and of discoveries of important new facts concerning the scientific aspects of our profession The results of these efforts have been so successful that we are now confronted with the unique problem how to take care of the numerous papers which are offered

The original object of our meetings was to foster investigation to keep American pharmacy abreast of that in other countries and even as leader and to maintain it on a qualitative plane at least equivalent to that of other professions To day there is certainly no need for altering that view in any respect, we should make it a single creed and rest well content if we can contribute in any great degree toward that goal

Nevertheless the situation in which we find ourselves warrants the most careful consideration There is now offered such a large volume of written reports that we have difficulty in caring for it If we continue to increase thus the results of our energy in research, there may come a time, if it is not already upon us, when the space available for printing will be entirely inadequate Under existing circumstances the ASSOCIATION cannot increase the size of the JOURNAL to make the necessary space What can be done to solve the problem?

One solution would be to accept finally only papers of merit That some of the matter which is offered could be classed as inferior and dispensable is well known Some of it is by no stretch of the imagination in the field of pharmacy some of it deals with easily accessible facts being merely summary or recapitulation some of it is of trifling nature hardly worth the importance assigned to it, some of it embodies only expression of opinions from the authors, without experimental facts As a zealous investigator your chairman may readily have been guilty with others, because intimacy with a particular problem can easily distort one's perspective The

fixing of blame, however is not of moment. The important point is the need for some reliable method of sifting in order to eliminate undesirable matter from publication by this section.

Let it be emphasized as forcefully as possible that your chairman, and without doubt our entire membership, would set no limit on worthy papers. If we should receive reports of this desirable sort, even up to many times our capacity to print, let us accept them gladly and find means to express our appreciation to the authors. The problem of finding space for publication could then be attacked.

It is first necessary, however, to sift out that portion of the manuscripts which could well be eliminated. To my mind the vital question is of quality and not of quantity. Our space in the JOURNAL should be occupied by scientific literature of a character as high as we can possibly make it, for by this literature is American pharmacy judged.

Our action, in 1933, of reviving the Board of Review of Papers and of insisting that all articles be submitted to it was an excellent step, but there is still opportunity for great improvement in this direction. Each paper which has been read during our sessions is at present automatically turned over to the Board. During the two years of this system, members of the Board have conscientiously taken their duties in the proper, serious way and have submitted each manuscript to minute inspection. The adverse criticisms and specific recommendations were then transmitted to the editor for action. Although the latter has power to refuse acceptance of any paper or part thereof, this places an excessive burden upon an already overworked individual. Whether he has or has not succeeded in having the manuscripts properly revised in accordance with findings of the Board is entirely immaterial. There should be some more reliable and easier method for getting the result accomplished.

Your chairman wishes to make recommendations on this subject, which to him seems to be our only important problem. That we should continue to foster a spirit of research, and endeavor to advance our profession as rapidly as possible in this direction is always mandatory, but no specific action is needed, each of us can aid by individual effort. On the other hand, we can as a body do much toward raising the quality of what goes into the JOURNAL. To that end it is recommended that

- 1 The Board of Review shall be given power to reject or accept papers, or parts of papers, for publication and to require revision by the authors when necessary.

If this were adopted, the editor would ultimately receive the manuscript in shape for printing except for editorial corrections and arrangement.

- 2 The Board shall be increased to ten members each serving for five years. They shall be selected and a chairman named by the incoming officers, acting collectively. Any vacancies by resignation or death shall be filled by the contemporary officers.

- 3 The Board shall draw up a list of rules and regulations for the guidance of its members and of authors. This list shall be presented for approval by this section at the next annual convention.

There is another matter which your chairman deems important enough to warrant careful consideration. You will have noted that a large share of the papers this year are to be presented by title only. This seems contrary to the spirit of our objectives since our primary purpose is to meet here in order to hear and discuss the results of recent research. It is recommended therefore, that

- 4 All papers must be presented as given on the program either in abstract or in total. In the case of unavoidable absence, presentation could be delegated to some one else conversant with the subject.

There is still one more matter which should be called to your attention, although no particular action is required. It seems logical to assume that the volume of worthy matter to be published will continue to increase in the future. Some day there will be need for an expanded journal or some new organ as a medium. At present the dues are insufficient to permit a larger journal or more frequent issue. Undoubtedly soon it will be necessary to find a source for greater income whether by larger dues, by abolishment of including subscription to the JOURNAL in these dues, by payment from authors for permission to publish papers or by some other means. While the section has no power to decide in what way this can be accomplished, yet each member as a voter in the ASSOCIATION, will have a vote in the final decision. It is good policy to accord this subject careful consideration so that we will be in a position to give meritorious counsel when the time comes.

In concluding, let me express my appreciation of the high honor conferred upon me a year ago in electing me as chairman of this Section. It has been doubly an honor to me because precedent was set aside in choosing an absent member. Your chairman hopes that you have not and will not regret that decision and that the present session will prove of satisfaction and profit to all of you.

After the reading of the Chairman's Address, Vice Chairman H. M. Burlage appointed the following Committee on President's Address: *Chairman*, Glenn L. Jenkins, Baltimore, Md., F. E. Bibbins, Lloyd E. Harris, C. O. Lee. (See report of Committee in minutes of the House of Delegates, October JOURNAL, pages 920 and 921.)

Chairman E. V. Lynn then resumed the chair, he called for the report of Secretary F. E. Bibbins. The report follows:

THE SECRETARY'S REPORT

B. F. E. BIBBINS

Your secretary wishes to offer the following report:

Your secretary appreciates the privilege of having been elected to this office and acknowledges the cooperation which he has received from the other officers.

A call for papers for the 1935 meeting was published in the JOURNAL in May, and this was followed by sending two hundred and eighty letters to a mailing list of the members of the Scientific Section. To this list is added from year to year those who have contributed papers for the first time. The response to this appeal was very successful as you will note that eighty-four titles appear on the official program.

There has been considerable correspondence from the secretary's office this year, partly due to the fact that every contributor was advised of a change in our By-Laws requiring that papers should be submitted in duplicate so that one copy would be available for publication and the other copy for the Ebert prize.

On motion duly seconded Chairman E. V. Lynn called for the report of Board of Review of Papers. It was presented by Chairman F. E. Bibbins. It follows:

REPORT OF BOARD OF REVIEW OF PAPERS, SCIENTIFIC SECTION, A. P. H. A.

The Chairman wishes to make the following report:

First, I wish to acknowledge the splendid cooperation on the part of the other members of the Committee in reviewing the numerous papers which were assigned to them by the Chairman and the promptness with which the papers were returned to the Editor.

This committee reviewed seventy-four papers, a considerable number of which were returned to the authors for corrections and some for rewriting. It was also necessary that a few of the papers be cut down. In every case the authors complied cheerfully with our requests.

I wish also at this time to acknowledge the excellent spirit shown by Editor Eberle as he has cooperated carefully with us in this work, even though at times it probably held up his work on the JOURNAL.

(Signed) FRANCIS E. BIBBINS,
Chairman

The report was received.

Chairman Lynn called for a report of the Committee to Cooperate with the National Conference on Pharmaceutical Research.

Chairman J. C. Krantz, Jr. stated that the Committee had no report.

The report of the Committee on Monographs was read by Secretary F. E. Bibbins.

The report was received and it was ordered that it take the usual course.

Chairman E. V. Lynn appointed the following as members of the Committee on Nominations: *Chairman*, L. W. Rising, Seattle, Wash.; F. J. Bacon, Cleveland; O. L. W. Rowe, Detroit, Mich.

Chairman Lynn stated that if anyone desired to bring anything before the Section the opportunity was now offered.

There being no general business the reading of papers was called for

The first paper on the program was entitled, "A Note on the Action of Alkalies and Alkali Salts on Antipyrine" by Lloyd E Harris and E D Tebow The paper was presented by Mr Harris (No discussion)

The second paper entitled, 'The Test for Redistilled Water in the N F VI Monograph,' by R S Adamson, R K Snyder and E N Gathercoal was presented by the latter

Glenn L Jenkins inquired why a more dilute reagent was not used and a greater volume of it He was informed that it did not make any difference whether $1/10$ normal or $1/20$ normal was used

The following papers were read

"A Note on the Assay of Mass of Ferrous Carbonate," J C Krantz, Jr, and C Jelleff Carr (No discussion)

'A Simplified Assay for the Official Iodine-Iodide Solutions' by Wm F Reindollar (Published in September JOURNAL pages 756-758)

"The Bactericidal and Bacteriostatic Value of Colloidal Cadmium Proteinate" W A Lott and W G Christiansen (No discussion)

"Antiseptics—a Comparative Study of Laboratory and Practical Tests," George F Reddish (Introductory remarks by speaker)

'A Modified Nessler's Reagent Test for Aldehydes in Ether' E C Billheimer, F Van Deripe, F F Berg and F W Nitardy (No discussion)

The following papers were read

The Sulphur Ointments and Their Assay 'Charles E Brady and Henry M Burlage (No discussion)

'Bismuth-Sodium Potassium Tartrate Solutions,' A H Clark In his absence this paper was read by E N Gathercoal and also the paper entitled

A Further Note on the Stability of Sodium Sulphite," A H Clark and Solomon Gershon Joseph Rosin stated that to obtain bismuth hydroxide reasonably free of nitrate, a cold solution of hydroxide must be used for precipitation

A paper entitled A Rapid Method for Standardizing Silver Nitrate Volumetric Solution," Robert D'Orazio, was read by title (No discussion)

Chairman Lynn announced that the next two papers entitled, 'Camphor in Camphor Liniment IV' and 'The Use of Antioxidants' by Charles F Poe would be read by title (No discussion)

A paper on 'Daturic Acid' was presented by Ralph W Clark (The paper is published in the October JOURNAL, pages 843 to 847)

The next paper on the program was 'A Study of the U S P Thyroid Assay' This is printed in the September JOURNAL, pages 742-747 The paper was discussed by F O Taylor E N Gathercoal and the author

Among the questions were several relative to the accuracy in assaying tablets with low thyroid content The author replied that if the content is low the quantity can be increased to a certain extent without disturbing the procedure

The next paper of the program was entitled, 'The Assay of Phenol Containing Preparations' by Glenn L Jenkins and Melvin H Duncan presented by Glenn L Jenkins (F O Taylor confirmed the work of the authors)

The following papers were read by title

Observations on Opium Assay" by Joseph Rosin and C J Williams (No discussion)

"Assay Hydrolysis Method for Opium Assay" G E Mallory and Peter Valaer, Jr (No discussion)

A paper on the Assay of Official Syrups containing Hypophosphites" Glenn L Jenkins and Charles F Bruening was presented by Glenn L Jenkins (No discussion)

The Assay of Official Hypophosphite Salts" Glenn L Jenkins and Charles F Bruening (No discussion)

The following papers were read by title

'The Assay of Organic Medicinal Preparations Containing Arsenic' Edward H Hughes (No discussion)

"Some Mercuriated Derivatives of Thymol and Carvacrol " Joseph B Burg (No discussion)

' Mercury Derivatives of Azo Dyes," Wm Braker and W G Christiansen (No discussion)

"Phenyl Mercury Nitrate and Some Other Phenyl Mercury Salts " T B Grave, S E Harris and W G Christiansen (No discussion)

The First Session of the Scientific Section was then adjourned

SECOND SESSION

The Second Session of the Scientific Section was convened by Chairman E V Lynn August 8th, 9 00 A M The reading of papers was continued The following were read

A Study of the Anesthetic Properties of Trichlorethylene," John C Krantz, Jr, C Jelleff Carr and Ruth Musser (It is printed in the September JOURNAL, pages 754 to 756)

Absorption of Drugs by the Human Skin," A Richard Bliss (Read by title presented by Frederick Grill)

J C Krantz Jr, inquired if phenol is more readily absorbed from a petrolatum base than from olive oil Mr Grill said there was no definite statement but that there was an inference that such might be the case

The following paper was presented

The Effectiveness of Theelol by Oral Administration," L W Rowe and A E Simond
Chairman Cook stated that there had been a great deal of variation in these products and an effort was being made to establish relationship He referred to the work of Dr H H Dale and a letter issued by him had been sent to interested laboratories and the suggestion made by the Biological Committee that they endeavor to develop cooperative studies in an effort to determine how uniformity can be brought about by cooperative studies

The following paper was read by title, Notes on the Colorimetric Assay of Digitalis" by Knudsen and Dresbach Method ' F A Upsher Smith (No discussion)

The following paper was presented

Comparison of Six Methods in Assaying the New Ergot Principle," Edward E Swanson, Chester C Hargreaves and K K Chen (The paper is printed in the October issue of the JOURNAL, pages 835 to 839)

L W Rowe desired to know the difference between this isolated rabbit uterus method and the guinea pig method whether the use of the rabbit's uterus is a method of direct testing just as that of the guinea pig's uterus or is it a reversal method F E Bibbins said it was not a reversal method but the alkaloid causes a contraction of the rabbit's uterus In work published in three laboratories has been referred to under Ergotocin Ergostetrin and Ergometrin It is probably present to the extent of $1/10$ th to $1/12$ th of the total ergot alkaloids, and although preparations containing it do not contract the rabbit's uterus, the isolated principal produces this effect

John C Krantz inquired whether ergotrate was the same alkaloid Mr Bibbins replied in the affirmative L W Rowe inquired whether he believed that this alkaloid is identical with the principle reported by Dale and Dudley Mr Bibbins replied that from samples obtained and data he was inclined to believe these three are all the same

The next paper was on Fluid Extract of Ergot Effect of Acidity on Biologic Activity and Determined by U S P 1935 Revised Assay," F F Berg (Discussion will be included when the paper is published)

The following paper was presented by title

' A Toxicological Study of the Cutaneous Secretions of the Salamander, *Triturus torosus* (Rathke) " Ernst T Stuhr (No discussion)

The next paper Dialkylamino Acetyl Ureas " T C Daniels The author was asked on what animals the tests were made he replied On White Rats '

The next paper ' A Study of the Assay of Aconite and the Stability of Its Preparations," George L Baker and Dean Charles B Jordan

L W Rowe inquired whether the method presented checked well with the U S P Method

C B Jordan replied that they did and the results were recorded in the paper The authors assumed that the variations experienced were due to errors in biological assay Other constituents

ents besides aconitine are active, but there does not seem to be much information obtainable on the subject

John C. Krantz, Jr. was of the opinion that more consideration should be given to the therapeutic use of aconite

The next paper by Arthur H. Uhl on "The Fatty Oil of *Podophyllum Peltatum*," was read (No discussion)

The next paper "Evaluation of a Deterioration Factor in Liquid Petrolatum," P. L. Burrin, A. G. Worton and F. E. Bibbins

F. F. Berg stated that the experience in their laboratory confirmed the work of the authors

The next paper was entitled, "A New Silver and Mercury Colloidal Compound," Earl Voelker (Discussion)

A paper by Henry J. Goeckel, "Modern Pharmaceutical Research Problems," was presented (No discussion)

Some Thymol Derivatives of Possible Medicinal Value," F. A. Gilfillan and John R. Merritt (No discussion)

The next paper was on "Solution Cresol Compound, the Variation of Phenol Coefficient when Different Oils Are Used for Saponaceous Base," P. L. Burrin, A. G. Worton and F. E. Bibbins (No discussion)

The next paper was entitled "Ephedrine Synthesis I. The Preparation of Propiophenone Diethyl Acetal and of 1-Phenyl-1-Ethoxy Propene 1," Ernest L. Beals and F. A. Gilfillan (No discussion)

Chairman Lynn then announced that there were three papers on strychnine

Strychnine IV. "Lethal Dose Studies on Cattle and Sheep," J. C. Ward and F. E. Garlough

Strychnine V. "Variations in the Same and Different Species of Rodents," by A. W. Moore

Strychnine VI. "Variations in Physiological Action of C. P.," as prepared by J. C. Ward, J. C. Munch and F. E. Garlough—There was no discussion

The following eleven papers were presented by title

"Studies on Barbiturates. XI. Further Contributions to Methods of Barbituric Research," Charles R. Linegar, James M. Dille and Theodore Koppanyi. Printed in the October JOURNAL, pages 847 to 852

"A New Crystalline Compound from Catnip," Minnie Meyer and Edward Kremers (No discussion)

"The Preparation of *p*-Butyl Saligenin," Robb V. Rice, W. C. Hardin and Glenn L. Jenkins

"A Chemical Examination of the Fatty Oil of Poke Root," Glenn L. Jenkins and Samuel W. Goldstein

"Evaluation of Vermicides," Glenn L. Jenkins and L. Lavan Manthey

"The Importance of Kidneys in the Standardization of Digitalis," B. Boucek (No discussion)

"A Comparative Study of the Pharmacological Actions of Natural and Synthetic Camphor," B. V. Christensen and H. J. Lynch (No discussion)

"Cyanide Poisoning and Its Treatment," K. K. Chen, Charles L. Rose and G. H. A. Clowes (Printed in the August JOURNAL, pages 625 to 630)

"Pharmacological Action of the Alkaloid of Han fang chi," by K. K. Chen, A. Ling Chen, Robert C. Anderson and T. T. Chow (No discussion)

Chairman Lynn announced a paper on "The Detoxification of Strychnine by Pentobarbital Sodium," Edward E. Swanson

A paper on "Gelatin as a Stabilizing Colloid for Oil in Water Emulsion Systems," Linwood F. Tice, was presented by E. F. Cook (No discussion)

The Second Session of the Scientific Section was then adjourned

JOINT SESSION SCIENTIFIC SECTION AND SECTION ON PRACTICAL PHARMACY

A Joint Session of the Scientific Section and the Section on Practical Pharmacy and Dispensing was called to order by Chairman E. V. Lynn of the Scientific Section. Chairman H. M. Burlage of the Section on Practical Pharmacy presided as co-chairman.

The first item on the program was a report on the United States Pharmacopœia by Chairman E F Cook. The report is printed in the September JOURNAL, pages 796 to 800.

The report on the National Formulary was presented by Chairman E N Gathercoal. It is printed in the August JOURNAL, pages 689 to 694.

The report of the Committee on Recipe Book by Chairman J Leon Lascoff was presented by title. It is printed in the August number of the JOURNAL, pages 694 to 699.

Chairman Burlage called for the Committee on Unofficial Standards. Former chairman J C Krantz, Jr. stated that the Committee had been discontinued.

Report of the Committee on Glass Standardization was presented by H V Army. (It was received.)

Chairman Lynn resumed the chair and called for the report of the Committee on Ebert Prize. It was presented by Chairman Glenn L Jenkins. The report of the Committee follows.

REPORT OF THE EBERT PRIZE COMMITTEE

Your Committee unanimously recommends that the Ebert Prize for the best paper presented at the 1934 meeting be awarded to Professor Marvin J Andrews, author of the paper "Determination of the Reasonable or Permissible Error in Dispensing."

(Signed) GLENN L JENKINS, Chairman FOREST J GOODRICH B V CHRISTENSEN

Chairman Lynn announced that the next item of the Program was the report of the Committee on Collection of Information Pertaining to Professional Pharmacy, prepared by Chairman M J Andrews and presented by Secretary Leon W Richards. The report was received—to be published.

The report of the Committee on Prescription Tolerances was presented by H H Schaefer. It was received—to be published.

The reading of papers was proceeded with.

The first paper entitled "Daphnia—The Biological Reagent" by Arno Viehoveer.

The second paper "Biochemistry of *Podophyllum Peltatum*" by Arno Viehoveer and Harry Mack, read by E F Cook.

These two papers were presented by lantern slides, showing the effects of these drugs.

After the conclusion of the papers a motion was made by R J Goodrich expressing thanks to the authors.

Chairman Cook stated that there is a reprint available concerning the propagation and means of keeping *Daphnia* alive and also a paper on the subject presented showing the action of drugs.

The Joint Session was then adjourned.

THIRD SESSION

The Third Session of the Scientific Section of the AMERICAN PHARMACEUTICAL ASSOCIATION was convened on August 9th at 9 00 A M by Chairman E V Lynn.

The reading of papers was continued. The first paper was entitled "The Alkaloidal Content of Oregon Grown *Cytisus Scoparius*" by F A Giffillan and Felipe Patricio Logan. (No discussion.)

E N Gathercoal read the following three papers: Morphological Studies on *Polygala Senega*, Paul D Carpenter, Studies on Poplar Bud, Gerston Bruch and Elmer H Wirth, Studies on Cudbear, Elmer H Wirth, L E Martin and F Soderdahl.

In commenting H W Youngken said the papers represented very careful work. The diagnostic differences of *Populus canadensis balsamifera* and *nigra* had been brought out. The paper on *Senega* represented careful study—the thicker and thinner walled cells of the phloem were explained hence the paper represents a distinct contribution.

The papers "A Study of *Laciniaria* Species" by B V Christensen and G M Hocking and "Differentiating Characteristics of Glycyrrhiza Plants" by Arno Viehoveer, were presented by title. (No discussion.)

The paper "Microscopy of Powdered Desiccated Thyroid and Suprarenal Glands," was presented by the author Heber W Youngken.

E N Gathercoal said that when it was first decided to introduce the powdered desiccated glands into the National Formulary the possibility of identifying them and detecting

adulterants was considered. The group to whom this was referred thought it would be impossible. This work of Dr. Youngken he was convinced proves that there is not only a means of identification but a means of determining adulteration. He spoke of the work of Dr. Dunn and of his assistant, the former were pleased with the results of Dr. Youngken's work.

L. W. Rowe inquired whether an effort had been made to differentiate between anterior pituitary and posterior pituitary.

The author replied that this is possible—The posterior originates from the nervous system and not from the epithelial tissue. (See page 576 of the July JOURNAL.)

Commenting on the next paper, 'A Method of Preparation of Buffers for Prescriptions,' by C. F. Allen, T. C. Daniels said that a related paper should be discussed before the Section on Practical Pharmacy and Dispensing, it is of particular interest to eye, ear, nose and throat specialists.

A series of papers on 'Drug Extraction' (5-9) was presented by William J. Husa. (See prior papers in the JOURNAL.) A remark by the author is applicable—'We are not as greatly interested in what occurs in the percolator as in what comes out of the percolator.'

The following papers were presented by title: 'The Influence of Certain Salts on Morphine Toxicity and Narcosis in Mice and Rats,' J. M. Ort and W. G. Christiansen; 'A New Type of Hypnotic Amide,' W. A. Lott and W. G. Christiansen; 'Preparation of Benzoyl Persulphide,' E. Moness, W. A. Lott and W. G. Christiansen; 'The Percolation of Cinchona,' J. L. Powers and Edward Kremers.

The next paper, 'Bioassays of Rodenticides,' J. C. Munch, F. E. Garlough and J. C. Ward was presented by J. C. Ward.

John C. Krantz, Jr., inquired whether white rats were used in the test. The author replied—White rats and rabbits. Other questions followed—asked how zinc phosphide was administered, the author replied—with acacia or other colloid. Responding to whether the oral method was always used in the tests, the author replied—yes, because they were concerned with the toxicity of these poisons in the stomach. Asked regarding strychnine—this had been administered in acacia, parenteral methods had been used, but they found variability, they used a large number of animals for making determinations and they are quite well satisfied—within ten per cent. on the basis of using 1500 animals.

A paper on 'Thallium,' XIII, was presented by J. C. Ward. (No discussion.)

The following papers were read by title. (No discussion.)

'Constituents of Ma fang chi,' A. Ling Chen and K. K. Chen; 'The Cat Units of Seven Crystalline Cardiac Principles from Plants,' K. K. Chen, A. Ling Chen and Robert C. Anderson;

'Harmine from Caapi,' A. Ling Chen and K. K. Chen; 'A Study of Several Species of the Genus *Monarda*,' B. V. Christensen and R. S. Justice; 'Histology of *Cracca virginiana* Linne Root,' B. V. Christensen and Elbert Voss; '*Monarda Pectinata*,' Nutt., A. Phytochemical Study,' Joseph B. Burt and Edward Kremers; 'Thiobarbiturates. III. Comparison of Sulphur and Oxygen Analogues,' Ellis Miller, James C. Munch and Frank S. Crossley; 'Enzymatic Action in the Presence of Some Common Antiseptics,' O. E. Rumble and R. J. Hartman; 'Some Properties of Ergostetrine,' Marvin R. Thompson. —(See September JOURNAL, pages 748-753.) 'Preparation and Toxicity of Bismuth Salts of Camphoric Acid Esters,' W. M. Lauter and H. A. Braun;

'A Study of Bismuth Salts of Gluconic Acid,' W. M. Lauter and H. A. Braun; 'Evaluation of Line Methods for Determining Morphine in Opium,' V. H. Wallingford and August H. Homeyer; 'Report of Chemical Assay for Ergot Alkaloids,' C. K. Glycart; 'The Volatile Oil from Western Yarrow,' R. L. McMurray; 'The Toxicity of Hydrocyanic Acid Gas,' J. N. Etteldorf.

A paper on 'Chemical Study of Sulphur Ointment,' Lewis C. Britt. (See October JOURNAL, pages 854-856.) Glenn L. Jenkins described a method by simple ignition of the ointment and then analyzed for sulphur by the Parr bomb method.

The report of the Committee on the Chairman's Address was read and received.

The report of the Committee on Nominations—L. W. Rowe, Franklin J. Bacon, L. W. Rising—was read by L. W. Rowe, nominating Chairman, H. M. Burlage, First Vice Chairman, Glenn L. Jenkins, Second Vice Chairman, J. C. Ward, Secretary, F. E. Bibbins, continues for 3 year term, Delegate to the House of Delegates, E. V. Lynn. After formal action the nominees were duly elected.

Glenn L. Jenkins reported the action taken on the award of the Ebert prize to Marvin J. Andrews. The action was approved.

The officers for the ensuing year were duly installed
 The new officers expressed their appreciation of the honor and accepted the duties of office
 The retiring Chairman, E V Lynn, expressed his appreciation of the honor of office
 The Scientific Section was then adjourned in due form

SECTION ON PRACTICAL PHARMACY AND DISPENSING

The First Session of the Section on Practical Pharmacy and Dispensing was called to order by Chairman H M Burlage at 9 15 A M He requested R W Clark *Delegate to the House of Delegates* to take the chair during the reading of the chairman's address The address follows

ADDRESS OF THE CHAIRMAN

BY H M BURLAGE

Since this is the first meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION on the Pacific Coast for many years and since many pharmacists are gathered in Portland for the annual meetings of the State Associations of Idaho, Washington and Oregon, this 83rd annual meeting should be a memorable one for all of us who are able to attend even though our coming has been at a great sacrifice I as *Chairman* of the Section on Practical Pharmacy and Dispensing, welcome all pharmacists here assembled, as well as the members of the A P H A residing on the Pacific Coast and in the Pacific Northwest, to our sessions and we hope that you will be benefited by the papers, discussions and deliberations which may arise We hope that you will convey to us manifold new ideas and thoughts which have been brought to your minds during your practice of our ancient and honorable profession in this region

I note on our program the names of several individuals who reside in this section and I hope that those of us who have purposely traveled far for these meetings will avail ourselves of the opportunity of becoming acquainted with these pharmacists for I know by virtue of the unusual opportunities that are offered them in this beautiful country that you will profit by their acquaintanceship I know whereof I speak, since I have had the advantage of five years' association and residence in this section

I do not intend to consume much of your time, as is so often done in chairmen's addresses to eulogize our profession Its history speaks for itself, its present and its future should concern all of us who are interested in its welfare

U S P , N F AND RECIPE BOOK

Within a short time we will have available new revisions of the Pharmacopœia, the National Formulary and the Recipe Book, which are the standards and the handiworks of our profession It behooves all of us to become thoroughly acquainted with these works, to see that every pharmacy in the country has these available and then to assist in a program of propagandism whereby the workers in the allied profession become thoroughly convinced of their value and of the worth of the products therein recognized Such works, in spite of the efforts of many reputable investigators, cannot be perfect and the research workers among us should immediately begin to study and examine them with an aim toward improvement These new editions, no doubt, will present some radical changes which we all hope are for the best

WORK OF THE OFFICERS

During the past year your chairman with the help of the officers of the Section, has attempted to nullify a criticism that has been made quite often with regard to the programs of this Section, *i e*, that many of the papers are too scientific in character, since they are offered by teachers of pharmacy and other scientific workers in laboratories of manufacturing establishments, etc, and that they, therefore are not of a practical professional nature representing the problems generally met with in the retail, professional and hospital pharmacies How justifiable is such a criticism? Possibly the facts will speak for themselves

A study of the programs of this Section for 1920-1934 inclusive reveals 316 papers representing the efforts of 399 authors or co authors, or 327 different individuals An examination of the titles of these papers in so far as your chairman's judgment could operate indicates that ap

proximately 170 (or 53.8%) of these were of sufficient interest to any practitioner of pharmacy in the retail, professional or hospital vocations. The remainder of the titles would indicate papers that pertained to the scientific aspects of individual subjects dealing with theoretical and scientific pharmacy. I am wondering, who of us could be so narrow in our views and outlook to demand that the latter types of papers be eliminated from our programs? Certainly we have too much of commercialism before us now.

We are, however, dealing with facts so let us proceed further in order to ascertain if the criticism mentioned is justifiable. Of the 327 individuals represented on the programs 166 (or 41.7%) were teachers and students (probably graduate students), 80 (or 20%) commercial and commercial laboratory workers, 44 (16 of which were doubtful) (or 11%) were retail and professional pharmacists, 33 (or 8.3%) unclassifiable, because of lack of information 23 (3 doubtful) (or 5.7%) hospital pharmacists and 5 (or 1.3%) members of boards of pharmacy. If the unclassified are considered as retail pharmacists this number rises to 19.3%, if board members and hospital pharmacists are included the total rises to 26.3%, or slightly more than one-fourth of the total number of authors were practicing pharmacists. Certainly not an imposing number considering the total of those working in the various classifications of the profession.

This résumé indicates that 73.7% of the authors of papers were teachers and laboratory workers. This large percentage no doubt, can be accounted for because these workers have probably more time available and better laboratory facilities for such work and, above all, a greater interest in the problems confronting the profession. Certainly the figures reveal that too few of the registered pharmacists in the retail, professional and hospital pharmacies are taking an active part in the A. P. H. A. and this section. The following reasons might be offered to account for this condition: (1) the average retail pharmacist is too busy with things commercial and too occupied in combating a competition for which he is mightily responsible, (2) and as a result of the first mentioned condition he is not primarily interested in phases of professional pharmacy which serve as the very core of the profession, particularly the dispensing department. This, to my mind, is one of the discouraging present-day aspects of pharmacy and one which we who are interested in the teaching of pharmacy, hope will be overcome in due time by the advent of the four-year minimum course in pharmacy. (3) apparently the proper contacts and methods of approach with the view of interesting these numbers in membership of the A. P. H. A. have not been followed by the individuals in the organization responsible for such a campaign. It is, of course, impossible to ever hope that every retail pharmacist would maintain a membership in the A. P. H. A., but I believe that almost 100% of the professional and hospital pharmacists of this country should hold such membership. Previous chairmen have time and again before this section recommended that the ASSOCIATION make special efforts to interest the latter two groups in the organization.

As a result of the above mentioned study the officers of the section decided to make special efforts to interest more practicing pharmacists in the activities of the section. Accordingly, letters were sent to the deans of the Schools of Pharmacy and secretaries of State Associations requesting the names of pharmacists who might be interested and capable of presenting a paper before this body, and it was emphasized that it was not necessary for the author to be present or for him to be a member of the association. What was the result of such a solicitation? One officer reports that in response to 17 letters—to 8 deans and to 9 state associations—only one reply was received and one name suggested and no paper. Another sent out 48 personal letters and received 8 replies from 5 deans and 3 secretaries and finally 6 replies from those whose names had been suggested. A third wrote to 10 secretaries and 8 deans received replies from 7 deans and no secretaries. These replies however included 31 names of individuals to solicit, three of this number stated that they would offer papers but I note only one title from this group on the program. A fourth sent out 35 letters to individuals in the pharmaceutical retail field. I believe the results of this canvass are almost self evident and indicate in a vivid manner why a majority of the authors are not practicing pharmacists, and it also points out how interested some deans and state secretaries are in the sections of the ASSOCIATION and what little faith they have in the capabilities of the persons whom they represent and have trained.

COMMITTEES OF THE SECTION

The chairman of the Committee on Glass Standardization previously requested that this

committee be discontinued, but the Section overruled the recommendation. Since he repeats his request I recommend that this committee be discontinued unless recent developments have arisen which warrant its continuation.

During the year a new committee known as the Committee for the Collection of Information pertaining to Professional Pharmacy was created, and under the guidance of Prof. Marvin J. Andrews has made remarkable progress. His report will be given at the Joint Session and should be of interest to all of us. Its work has just begun and I recommend its continuation and that the Council be requested to appropriate \$75.00 to carry on this work. This appropriation includes \$50.00 to cover expenses of correspondence for 1935-1936, and \$25.00 to purchase filing materials for properly preserving the information collected during 1934-1935, in the INSTITUTE OF PHARMACY. I further recommend that the new chairman hold intact the present personnel of this committee unless the committee chairman requests changes or additions since its work will be handicapped by the appointment of new members who are not familiar with procedure that is being followed.

In conclusion I wish to express my appreciation of the honor that the Section has bestowed upon me in electing me its chairman, and my thanks are offered to the officers of the Section and others who have cooperated in the work that has been done, and especially to Secretary Richards who deserves all the credit for the program which follows. His task has been a difficult one.

I recommend that in Chapter IX, Article II, the words "and a brief abstract of all papers, not to exceed 250 words" be deleted.

A motion was made by William Gray, seconded by E. T. Motley, that the Chairman's Address be received and referred to a special committee. The Acting Chairman appointed H. A. Langenhan, E. T. Motley and C. F. Lanwermyer.

REPORT OF THE SECRETARY

BY LEON W. RICHARDS

The Section on Practical Pharmacy and Dispensing has endeavored to enlist the interest of as many new contributors as possible by definitely centering the attention of this meeting on the fields of retail, professional and hospital pharmacy.

The Secretary wishes to express to his fellow officers his appreciation for the assistance given him in sending out the necessarily large number of personal letters to accomplish this end.

The response from pharmacy men, especially those of the Northwest, is ample reward for our efforts, and I wish to thank each author on our program for his interest and cooperation. The report was accepted.

Chairman H. M. Burlage appointed E. L. Hammond, R. A. Cain and E. T. Motley, *Chairman* members of the Committee on Nominations.

The Chairman announced the reading of papers.

The first paper was presented by George D. Beal, "Carbo Activatus," by Joseph Rosin. George D. Beal, Chester R. Szalkowski. (Published in August JOURNAL pages 630-634.) "Fore sight in Professional Pharmacy" was read by title, because of the unavoidable absence of the author, E. T. Stuhr. Dentistry and Pharmacy as Cognate Professions" was presented by the author Raymond P. LeRoy. Drawing on his paper he said that a slightly hypotonic solution was desirable for the purpose of anesthetic efficiency. The matter of containers for novocain solutions was also discussed. The next paper "Is Extemporaneous A Moribund Art?" by Wm. F. Reindollar, was read by title. "Back to Pharmacy" was presented by Roy A. Perry.

William Cray complimented the author. He questioned the guaranteeing of a preparation in some instances refunding of the money would not answer the purpose he had in mind. The simple ailment might result in a more serious one. The subject was discussed along related lines by E. R. Serles, P. H. Dirstine and L. D. Bracken.

The author stated that all dispensing required judgment, it is necessary to use care and he always had in mind the best possible preparation rather than a large sales volume. There was a demand for packaged medicines and in his opinion—to supply a better preparation was a service. He always advised consulting the physician and dentist but many times the patrons would say—they were not that sick.

L. D. Bracken said he did not sell patent medicines but he realized the economic de

mand for such products. He invariably advised the patron to consult the physician, but if the patron insists on making a purchase, it is better to supply what the pharmacist has prepared carefully and honestly.

H A Langenhan thought there was opportunity along the lines advocated by the author, provided thought and care was exercised.

There was no discussion of the paper on 'Manufacturing and Marketing Toilet Products from Your Own Laboratory,' by Alex F Peterson Jr.

'New Products and the Problems They Present,' by Ronald V Robertson. The author discussed the subject, he referred to a number of preparations representing the same product and necessitating the stocking of them. Earl Gunther commended the paper and in his opinion something should be done to correct the situation.

The paper on 'The Stabilization of Milk of Magnesia by Citric Acid,' E C Bilhuber F F Berg and F W Nitary, was temporarily deferred on request of F F Berg.

'A Service That Built a Prescription Business' was presented by L D Bracken.

H A Langenhan endeavored to get the physician's viewpoint on the subject of the paper. The author, whose pharmacy has the largest medical practice in the Northwest, said that physicians sought advice. The pharmacy has an average of eighteen calls from physicians to consult on prescriptions for patients.

William Gray stated that physicians wanted information along the lines discussed in the paper. He had read a paper before the Council on Medical Education, by request. Leading men of the medical profession commented favorably, the sum and substance of their opinions being,

"Consult your pharmacist—you can learn something." He was of the opinion that physicians welcomed assistance from pharmacists.

The author closed the discussion by saying that some physicians are hesitant in seeking information, but the bigger the man the more readily he will receive information.

There was no discussion on the following papers: 'The Need of Greater Care in the Dispensing of Potent Medicinal Substances in the Form of Sugar Coated Pills in Confections,' John F Suchy; 'The Hospital Pharmacists' Work in Southern California,' P W Howard (Read by title); 'A Plan for Pharmacy Internships at the University of Michigan Hospitals,' Harvey A K Whitney and E C Watts; 'Professional Aspects of Pharmacy,' S H Dretzka (Read by title).

On motion duly seconded the First Session of the Section on Practical Pharmacy was adjourned.

SECOND SESSION

The Second Session of the Section on Practical Pharmacy and Dispensing was convened at 9 00 A M, August 9th, by Chairman H M Burlage. Ralph W Clark acted as secretary, owing to the temporary absence of Secretary Leon W Richards.

The reading of papers was continued.

C O Lee read a paper on 'A Study of Compound Cresol Solution' by K L Kaufman and C O Lee. The speaker pointed out the value of this work to the students. A method had been devised for making this solution in fifteen minutes, while another formula required three hours. He stressed the necessity of exactness in making the preparation.

H M Burlage referred to the use of soft soap in a rapid method for the preparation.

The next paper was entitled—'The Physician and the Pharmacist' by Ralph W Clark. The author commented, 'that pharmacists should read the literature of their Associations and pharmaceutical publications and they should take an interest in public health matters. If pharmacists would stress professionalism more, the public would be willing to pay more and would look up not down on the profession of pharmacy.'

C O Lee inquired how this could be brought about. The author replied—that in Wisconsin they were particularly fortunate in having a president who had experience in both professional and commercial pharmacy.

Frederick Grill stated that their students were impressed with the ideals of Pharmacy. William Gray thought that meetings within the school would prove helpful. Earl Gunther thought that colleges should seek out the problems of the practical pharmacist. C O Lee referred to the fact that commercial ideas predominate. William Gray acknowledged the difficulty in stimulat-

ing interest in pharmacy H M Burlage pointed to the influence of those who belittled professional pharmacy and that, perhaps a division of the students into two groups might prove helpful Earl Gunther referred to a statement of the professor, "that students should forget their practical (?) store experience" He learned his lesson when the professor informed him that because he had not forgotten his practical (?) experience, his grades were low Ralph W Clark stated that, in Wisconsin, they were trying the experiment of having professional pharmacists talk to the students

"Ointments" was the subject of a paper by Ralph W Clark He contended that extensive research was required for determining a scientific base

William Gray referred to cold cream as a base C O Lee said that absorption of ointments is one of the subjects requiring further investigation K L Kaufman had completed a study of absorption of vitamins, in his experiments with white rats he experienced considerable difficulty in preventing them from eating the Ointment The reports were somewhat contradictory, he was of the opinion that this presented an interesting field for research and, if any were interested Mr Kaufman and he would be glad to submit their line of work

Sylvester Dretzka presented "The Professional Aspect of the Drug Store" He was of the opinion that something should be done to help those pharmacists who have been in practice for many years to catch up with modern ideas Perhaps lectures should be provided on pharmaceutical developments, post-graduate work could be arranged so that these pharmacists would realize the importance of their profession, this would help to reestablish pharmacy

He had used the "Open House" idea, inviting patrons and others to inspect the pharmacy, the visitors were interested and gained a better understanding of the work carried on by pharmacists He referred to an idea borrowed from the plumbers The Plumbers' Association sends men about the country to acquaint dealers and others with plumbing from the public health standpoint They contact the Chambers of Commerce Rotary Clubs, etc, and keep high salaried men busy all the time, the plumbers contribute toward this expense "Similar action," he said, "by pharmacists would be of benefit" Legislation is passed but when it comes to professional matters the legislators are indifferent

George L Secord said that when favorable legislation is passed, pharmacists should let the legislators know their action is appreciated

REPORT ON THE CHAIRMAN'S ADDRESS

Chairman H A Langenhan presented the report of the Committee on the Chairman's Address The report, with the exception of the action on the presentation of abstracts of papers is reported by Ralph W Clark *Delegate to the House of Delegates*, in the October JOURNAL, page 922 (This part of the Committee Report is made by reference to the former)

The following is abstracted in brief from the discussion H A Langenhan favored the submission of abstracts, not to exceed 250 words The chairman of the Section recommended that abstracts be not required—(see Chairman's Report at the beginning of the minutes of the First Session) (The Editor stated that abstracts of the Scientific Section were distributed, a few are left and those interested may obtain copies on request) H A Langenhan said that abstracts if distributed would enable the members to become acquainted with the presentations The following expressed approval of continuing the abstracts C O Lee, John Suchy, F F Berg, Charles F Lanwermyer

Chairman Burlage suggested, if the abstracts are continued, they be numbered as the titles of the papers on the program

Mr Langenhan said the requirements are—"if the abstract is not presented, the paper may not be accepted" Mr Clark stated that the abstract must be in the hands of the secretary After some further discussion it was decided to continue the abstracts

The reading of papers was continued "The Hospital and the Pharmacist Some Observations in Establishing a Department of Pharmacy," by H C McAllister H M Burlage read the paper and commented on the young man's experience and ability The pharmacy department of the Hospital had been a losing proposition The author pointed out the necessity of a competent pharmacist, as a result of the changes the dispensing service had been improved and made profitable

Ralph W Clark said the paper should interest pharmacists in hospitals William Gray stated that each hospital has its problems depending on the size of the hospital and the medicines

supplied, this paper shows that pharmacists in hospitals can make their services worth while. H A Whitney spoke along related lines, E T Motley had been a member of a committee to look into the number of pharmacists employed in hospitals and was surprised at the small numbers, he thought something should be done to improve that situation.

The following papers were presented by F F Berg, who commented briefly on them:

"The Stabilization of Milk of Magnesia by Citric Acid," E C Billheimer, F F Berg and F W Nitardy, "Comparison of Spectrometric and Antimony Trichloride Methods for the Estimation of Vitamin A Potency of Fish Liver Oils," W S Jones, F F Berg and W G Christiansen, "Study on Washing of Milk of Magnesia through a Permeable Membrane," E Moness, W A Lott, F F Berg and W G Christiansen, "Medicine Dropper to One Minimum per Drop," R A Konnerth, R E Schoetzw and F W Nitardy, "Assay of Liniment of Camphor," by D A Overby, R E Schoetzw and F F Berg.

The next paper entitled "Percentage Solutions" was presented by Earl Gunther, the author, who explained some of the points in percentage solutions and also brought out the details of prescription pricing, based on the Pacific Drug Review Schedule.

He was of the opinion that much must be learned by the pharmacist from practical experience and suggested that practical application should be made in the class room and that teachers should seek practical problems.

H M Burlage stated that he welcomed suggestions from pharmacists for class room study. The paper was further discussed by William Gray, W J Husa, Arthur D Baker and Mr Snelling.

The chairman presented "Studies on Three U S P and N F Preparations," by Henry M Burlage and W J Smith. Secretary Leon W Richards presided during the reading of the paper. The speaker stated that he impressed on the students the possibility of improving the methods of the standards.

The following papers were read by title: "The Preparation of the Resin of Podophyllum," Arthur H Uhl, "Hydrophile Petrolatum," Bernard Fantus and Hattie Dyniewicz, "Improvement in Technique in the Preparation of Three Common Products," Edward D Davy, "Tincture of Opium—Process to Reduce Precipitation," P L Burrin and F E Bibbins, "Suggested Changes in Three Official Preparations," C L Cox, "Modernized Progress of Pharmacy in the Realms of Dispensing," C George Hamilton, "Errors in Methods Used for Testing Enteric Coatings," F S Bukey and C W Bliven, "The Percentage Preparation," Ralph Bienfang, "A Table of Equivalents," Ralph Bienfang, "It Can Be Done—Difficult Preparations Series No IV," J Leon Lascoff, "Pharmaceutical and Chemical Incompatibilities," George L Secord, "Chemical Stability of Anesthetic Ether—Formation of Aldehydes and Peroxides in Ether Stored in Containers not Sealed or Tightly Closed," J E Aurelius, E S Herlong and F W Nitardy, "Practical Pharmacy as Practiced in Free Hospital Clinic of Jefferson Davis Hospital of Houston Texas," F N Bono, also a paper by G A Newton. (Not of record.)

Chairman Burlage stated that if there was as much interest in the Section and as many or more papers, the Section would require more time.

E T Motley, as chairman of the Committee on Nominations, presented the following list of Nominees: *Chairman* L W Rising, *First Vice Chairman*, Frank L Black, *Second Vice-Chairman* H A K Whitney, *Secretary*, Leon W Richards, *Delegate to the House of Delegates*, H M Burlage.

There being no further nominations the nominees were duly elected.

Chairman H M Burlage thanked the members and expressed his satisfaction with the large attendance during the sessions.

On motion duly seconded and a vote the meeting was adjourned.

(The report of the Joint Session of the Scientific Section and of the Section on Practical Pharmacy and Dispensing is published in connection with the minutes of the Scientific Section.)

SECTION ON EDUCATION AND LEGISLATION

The First Session of the Section on Education and Legislation was convened, owing to the absence of Chairman Oscar E Russell by L Wait Rising, Secretary August 7th at 2 15 p m.

The following communication was read from Chairman Oscar E Russell:

Fellow Members

"Please do not consider this a learned address embracing all the phases of pharmaceutical education and legislation and a host of recommendations for future improvements

' Since my contact with this Section has been rather limited I do not feel qualified to deliver or write an address of this nature Please consider this as a message of greeting to those present and an apology for my absence

' It is indeed with very deep regret that unusual circumstances have made it impossible for me to be with you The program for this year's Section meetings seems to me to be unusually broad and comprehensive and from the titles of the papers submitted I would say they will be most interesting The entire credit for this very admirable program should go to your able secretary Mr Rising who I know has given much time and thought to its preparation I wish also to express my sincere thanks to those who have given their time and thought in preparing these papers

' In conclusion if I were to offer any suggestion whatever for your consideration it would be that more attention be given to the legislative part of our program than it has received in the past sessions It might be that the entire program of one of the sessions of the next meeting could be profitably devoted to this subject Again assuring you of my sincere regret in not being present

(Signed) OSCAR E RUSSELL, *Chairman*

The Report of the Secretary was read

THE REPORT OF THE SECRETARY

BY L W RISING

The secretary carried on the usual activities incident to the organizing of the annual program for the section No form letters were sent out from his office All the solicitation for papers was done by personal letters with gratifying results The wholehearted and willing cooperation of the persons contacted in making the work of the Section worth while and of real service to Pharmacy spoke well indeed for the character of the leaders in our profession

The 21 speakers represent geographically practically the whole of the United States coming as they do from North East South Middle West and West They are a true cross section of the ramified activities of the calling Among their number are educators state board members editors and men engaged in the commerce of pharmacy

Two new activities of the Section have been carried on this year by committees They are the work of bringing the dental profession in close association and cooperation with pharmacy and strengthening hospital pharmacy and its liaison with the profession as a whole These endeavors are worthy of the continued support of this body

The secretary desires to take this opportunity to publicly thank those who appear on the program for their efforts in behalf of pharmacy and the other officers of the Section for their aid in making his duties lighter

The report of the secretary on motion duly seconded, was accepted

The first paper "Educational Problems in Pharmacy," was presented by Dr H B Carey of the University of California (It will be published in a succeeding issue with comments)

Acting Chairman L W Rising appointed the following committees Committee on Resolutions—H A Langenhan *Chairman*, H A K Whitney, Leon W Richards Committee on Nominations—Ralph W Clark *Chairman*, Lewis C Britt E L Hammond

The next paper 'Fair Trade Legislation' was read by Frank E Mortenson (To be published)

The report of the Pharmacy Committee on Professional Relations pertaining to Dentistry was called for, it follows

REPORT OF THE PROPOSED NATIONAL PHARMACY COMMITTEE ON PROFESSIONAL RELATIONS PERTAINING TO DENTISTRY

BY GEORGE C SCHICKS *Chairman*

Unfortunately the resolutions passed by the Section on Education and Legislation last year were not presented to the Committee on Resolutions of the AMERICAN PHARMACEUTICAL ASSOCIATION in time to receive consideration

Chairman Oscar E. Russell of this Section appointed the writer of this report chairman of the above mentioned Committee assuming its approval by the Council of the AMERICAN PHARMACEUTICAL ASSOCIATION. As it now stands there is no such committee unless we follow the suggestion to resubmit the resolutions again this year. With this in mind—

I recommend that this Section adopt the following resolutions so that they may be immediately passed on by the Committee on Resolutions of the AMERICAN PHARMACEUTICAL ASSOCIATION

"To the end that helpful information regarding ways and means of encouraging the prescribing of U. S. P. and N. F. drugs and preparations by dentists be disseminated and made available to the pharmacists of this country, and to the end that the good work of one community or state may not be lost to other communities or states, therefore, be it resolved

That a Committee be appointed—to be known as the National Committee on Professional Information Pertaining to Dentistry. Its specific function shall be

First—to study the methods used by the various local, county and state organizations in their efforts to bring before dental men usable information on U. S. P. and N. F. drugs and preparations

Second—To present to the pharmacists of the nation at our next annual convention a digest of constructive ideas gathered from such a survey and other sources

Third—The Committee is to act as a center for receiving and disseminating information which will increase the pharmacist's opportunities for professional scientific service to the dentist

Fourth—The chairman of the Committee is to be appointed by the incoming chairman of the Section. He in turn will add members to make it a workable committee."

Be it further resolved that the chairman of the Section on Education and Legislation appoint a committee to study the problem of cooperation with hospital pharmacists and their service to the allied medical professions

(See report of Committee on Resolutions in August JOURNAL, 1935 pages 711 and 713. Also address of the Chairman, July JOURNAL 1934 page 735.)

REPORT COMMITTEE ON COOPERATION WITH HOSPITAL PHARMACISTS

BY ROBERT W. RODMAN, *Chairman*

In view of the fact that the resolution creating a Committee on Cooperation with Hospital Pharmacists, which was approved by the Section on Education and Legislation at last year's convention, was not received by the Committee on Resolutions of the American Pharmaceutical Association in sufficient time to permit confirmation, and thus has been unable to serve this Section in the manner outlined in the paper by the writer last year

My appointment as chairman of this Committee was predicated on the assumption that the Committee would be authorized by the parent body and since this was not done there has been no committee activity carried on

If the Section on Education and Legislation still feels that it would be well to investigate ways and means of extending the services of our group to hospital pharmacists in their problems, in a greater measure, I should recommend that the resolution creating this committee, as passed at the 1934 meeting of the Section, be retransmitted to the House of Delegates of the AMERICAN PHARMACEUTICAL ASSOCIATION

On motion, duly seconded, George C. Schicks was requested to forward the resolutions of the foregoing to the Resolutions Committee, A. P. H. A.

Reading of papers was continued. "Entangling Alliances" by Wortley F. Rudd (To be published.)

R. A. Lyman commended the paper and stated that every one engaged in pharmacy had been troubled with the problems touched upon in the paper—that it presented problems that for 27 years had been discussed in an effort to work out some solution

The Green River Anti Peddling Bill" was presented by F. C. Felter

In discussing the bill Mr. Felter added, that in California they organized retail merchants and housewives and had legislation passed but later it was attacked by attorneys representing the various vending companies and that the Fuller Brush Company attempted to bring a test case

The merchants were able to organize the groups again, however, and the law is still on the statute books of some one hundred cities on the Pacific slope Mr Felter stated that he had prepared a sheet of suggestions and information and also an opinion from an attorney which had been sent out, together with copy of the bill, to all retail druggists inquiring for assistance

C B Jordan asked how effective the law had been The speaker replied that in Santa Cruz their experience was that during the first sixty days something like one hundred peddlers were brought before the court He stated that they had the Green River bill on their statute books and, accordingly, the peddlers do not bother Santa Cruz He said that enforcement, of course, is the greatest problem and at the same time, the bill's strongest feature, that its enactment and enforcement depended a great deal upon the cooperation of the housewife for the reason that the city officials have no record of peddling but the merchant's wife, clerks, etc, soon get on to it and when approached they call the police department and it is not long before the peddler passes the town by

Mr Felter mentioned some letters he had received from Mr Rutherford on the subject which he said were very enlightening and stated that the retail merchants housewives etc, should work together for a common purpose

R L Swain inquired if any attempt had been made to pass a state law of this character The speaker had no knowledge of a state law The former then stated that a bill of this character had found its way into the legislature of Maryland at different times and that among seven or eight bills endorsed by pharmacists in the legislature it was the only one that had found its way in and then out (unsuccessful) and cited cases where peddlers would purvey concoctions of small value from door to door at prices of \$2 50 to \$5 00 a pint or quart unlabeled He told of efforts of lobbying companies with the county health officers and boards of hygiene to kill the bill, and stated there seemed no limits to which they did not go

Mr Felter stated he felt it was necessary to first get the measure into effect in small towns and municipalities—that any objections of city councils must be overcome and in that way it was not difficult

Mr Swain thought the measure a sound one and his idea in bringing up the question of state passage was curiosity to know if any states had been successful in establishing such a law Mr Felter cited other cases

General discussions brought out that medicines and articles of doubtful value and of very low manufacturing cost were sold in house to house canvassing at exorbitant prices

The next paper, "Presentation of Basic Sciences in Colleges of Pharmacy," was presented by T C Daniels, the author He concluded his paper by stating that he felt we should follow up the basic sciences with proper application when students are prepared for it, but not until then

Ernest Little stated that he had expressed his idea on the subject quite thoroughly in his address although he felt that Mr Daniels had gone a step further, he concurred in Mr Daniels' opinion that with the four-year course the students have an adequate amount of time, which was not the case with two- or three-year courses

C B Jordan called attention to the method of instruction citing methods used by C J Klemme in making application at the time of teaching the basic sciences and touching upon success with which he had met

H B Carey stated that experience had taught him that an average student has a very moderate capacity and that if he were able to grasp one point at a time on the subject presented he was doing exceedingly well, that the average student wanted to see the application of that in which he was interested He would become absorbed in it and lose the point of the reason and basic understanding of the topic He felt from an educational point of view the subject should be presented so as to develop the student's idea of reasoning, regardless of application, that if he were able to use his head—could walk alone—that he could take care of himself and that that was the basis of the procedure he recommended

On motion, duly seconded, the First Session of the Section on Education and Legislation was then adjourned

SECOND SESSION

The Second Session of the Section on Education and Legislation was convened August 9th, at 9 00 A M, by L Wait Rising

The chairman announced that none of the authors of the remaining papers were present, they would be read by title, unless there was objection (Titles of all papers are printed in July JOURNAL, page 593)

(Minutes of the Joint Session with the Section on Education and Legislation, Conference of Pharmaceutical Law Enforcement Officials and Pharmaceutical Association Secretaries, will be published in the same issue with the proceedings of the Conferences)

Claire A Dye stated that a paper by George C Schucks on "National Unity of State Cooperation between Pharmacists, Physicians and Dentists" had been read by title, and as the author was present, he asked for the reading of the paper (It will be published in the December number of the JOURNAL) The paper was read and action taken in accordance with report of the First Session

H E Kendig asked the author whether consideration had been given to the method of raising the money in order to establish such a bureau The author replied that this had not been gone into The discussion had brought about a very favorable feeling toward the creation of such a body for laboratory work, special information to pharmacists etc The Council had been advised of the action, and the pharmacists throughout the country are desirous for the establishment of such a bureau It is hoped that the Council will find a way to give needed information, even if the laboratory is not established at once He knew where the money was coming from in his State—that the medical men were very willing to contribute a part, as they were desirous to keep the bureau going—the medical men are just as eager as the pharmacists

H E Kendig stated that inasmuch as L W Rising had a paper among those included by title he would be interested in hearing it read and the chairman stated that he would give a short résumé of his paper

The subject dealt with the idea of selling pharmacy to the general public by advertising the profession through the medium of increased apparatus in the prescription department and to make that increased apparatus visible to the public, not an open prescription department but rather adding to the extra equipment that pharmacists do not usually have for prescription and manufacturing purposes For instance, he thought it would be a good idea for all pharmacists to have a sterilizer of some sort in the prescription department He stated that it would serve two purposes—it would be an efficient piece of equipment and a good advertising medium as well He believed the public is impressed when they see a thing of that sort particularly when it is in operation He pointed out that beauty shops used displays of scientific-appearing apparatus and that the patrons were impressed by such equipment—would patronize the stores displaying such apparatus more readily than they would one with less efficient equipment He also called attention to preferability of garages with modern equipment stating that it created the idea and atmosphere that those garages are progressive Doctors' offices where shining equipment is displayed create the idea that the office is up-to-date and that he himself, would have more faith in that doctor than he would in one whose office was not well equipped, although the latter might in reality be a better physician It was a psychological problem The pharmacists should invest in equipment and apparatus for manufacturing purposes, have the prescription rooms well equipped to do their manufacturing operations and to place such equipment out where it is feasible to make use of it in some of the minor technical operations of manufacturing There were two aspects to this suggestion one a psychological and advertising aspect and the other, a practical side

H E Kendig thought Mr Rising's idea a splendid one, looking at it from a psychological point of view He felt that it would establish in the minds of people the idea that there was more to pharmacy than cheap merchandising in the window It would create a good impression and that it would do as much to establish pharmacy on the scientific basis in the minds of the rank and file of people as the activity of the various pharmacists and the tremendous effort put into Pharmacy Week

S J Hall stated that he had a retail store in which he had an open prescription room and whenever they were doing any distilling filtering, etc or anything that would appeal to the public it was always done in a place where it could be seen

George C Schucks believed that when advantage is taken by the pharmacist in having scientific apparatus displayed in his store he is taking advantage of one of the greatest advertising possibilities that is within his power to obtain He had seen that work out as he had gone into a professional store equipped in such a manner with apparatus which could be seen readily from the front of the store Two ladies came in with prescriptions and they looked at this apparatus

and commented that they had never seen that in a drug store before. They had no idea that a pharmacist used that kind of equipment. The pharmacist took a few minutes of his time explaining the action of the sterilization machine and incidentally brought into the conversation other points. He did a good job of selling the scientific part.

S J Hall referred to the attractive windows of Frank Nau's pharmacy, stating it was well worth one's while to see them, he had many compliments on his windows, and received recognition at different times in national publications.

A paper not listed on the program was included among the papers of this Section, entitled 'Estonian Pharmacy Forges Ahead,' by Rudolph Wallner.

E L Hammond reported for the Committee on Nominations as follows. C Leonard O'Connell, *Chairman*, Vice-Chairman, G C Schicks, *Secretary* George A Moulton, *Delegate to House of Delegates* L Wait Rising.

Claire A Dye moved that the report of the Committee on Nominations be received and the Chairman instructed to cast a unanimous ballot of the Section electing the officers nominated. The motion was duly seconded and unanimously carried.

There being no further business before the meeting the Section was adjourned.

SECTION ON HISTORICAL PHARMACY

The First Session of the Section on Historical Pharmacy was convened by Chairman C O Lee at 2 00 P M, August 7th. The first order of business was the reading of the Chairman's Address, it follows:

KNOWING THE HISTORY OF ONE'S PROFESSION

BY C O LEE CHAIRMAN

It is hard to believe that there is more fascinating reading than that which is to be found in the many interesting books written upon the history of medicine, pharmacy and science. They present a panorama of man in his struggles to move up and out of conditions in which he found himself. In an effort to rid himself of suffering, primitive man tried those things near at hand. Among them were cool leaves, roots and herbs. The story of man's use of, and belief in, all sorts of substances as medicinal agents to relieve pain, is a story that is as old as man himself. It is a fascinating account of human progress.

Sarton says "When one reads the history of science one has the exhilarating feeling of climbing a big mountain" (1). The reading of pharmaceutical history often stimulates the reader but there are also depressing spots in it. In meditating upon the depressing pages of history I have often wondered how progress was at all possible.

Like religion, medicine and pharmacy have survived the influences of terrible superstition and ignorance. In saying this I do not mean to imply that these retarding influences have all disappeared, for they have not. There is reason to believe however that we are much more enlightened upon the subjects of science and religion notwithstanding the fact that some folks still choose to believe irrational and unwarranted things about either or both.

There are at least two good reasons for studying the history of pharmacy or any other science. One is purely a historical reason, the other for the purpose of understanding the science. If one really knew the history of pharmacy through the ages he could chart a reasonably accurate account of the political and social struggles of civilization through centuries of progress. Then too if pharmacists knew the long and interestingly fascinating history of their chosen profession they would be much prouder of it than the average druggist seems to be.

Not so long ago the writer placed a chart of famous pharmacists and their discoveries before a class in the history of pharmacy. It was pointed out that pharmacists, one hundred and twenty years ago, were discovering the alkaloids and various other important compounds and elements. In discussing the fact that pharmacists are not in these days, known for their famous discoveries a member of the class suggested that they are too busy selling cigarettes and soda water. We fear that there is too much truth in the suggestion a situation which is in serious need of improvement. A knowledge of the history of pharmacy is of prime importance to pharmacists and scarcely less so to the historian. It would be of great interest and value even to the laity.

In the introduction to 'Sixty Centuries of Health and Physic,' is to be found the following interesting statement "In order to understand properly a man, an art, or a science, a knowledge of their development and past history is essential, what embryology is to the study of man's structure and evolution, history is to the comprehension of an art or a science" (2) Following up the suggestion of this quotation we find it hard to reconcile a noble professional past with a present doubtful one. Even so, pharmacy, as we know it to day, shines through and beyond a lot of commercial trappings as a profession. It is truly a science and an art.

The Section on Historical Pharmacy was organized in 1902 and has held one or two interesting sessions at each of the annual meetings of the ASSOCIATION since then. By a rough count it would appear that about five hundred papers have been presented before the sessions of the Historical Section. They have stimulated much worth-while comment and discussion. A number of the papers have been printed. It is to be regretted that they have not all appeared in print. By the persistent efforts of a few members, devoted to the cause of historical pharmacy, the Section seems, now, to hold a position of wholesome respect and interest in the ASSOCIATION.

The historical accounts that have been presented to the Section have come chiefly from those primarily interested in the subject. There is a certain pleasure to be had in searching for facts and the truth behind them. Instead, however, of depending for our history upon just a few interested individuals we need to do more sowing of the spirit of historical research in our schools and colleges. G. F. Milton has recently said that the writing of history is a science, an art and a profession. He continues by saying, 'In its scientific aspect history writing involves the discovery of sources, the appraisal of data, the search for the causes as well as the consequences of events' (3). In the light of such an estimate of history we need to look to our schools for better training in the subject.

In a recent survey of the pharmacy catalogs I was impressed with the meager amount of time allotted to courses in the history of pharmacy. Even more discouraging is the fact that some schools entirely ignore the subject. Our curriculum makers need to be apprised of the importance and value of a study of the history of pharmacy and science. We would do well to heed the following statement by Seelig: "The opinion of medical educators is unanimous, regarding both the practical and cultural value of the study of the history of medicine" (4). If it is good for medicine and science it is also good for pharmacy.

In taking account of the many interesting books which have appeared in recent years upon the history of medicine and science, it is to be regretted that pharmacy, in America at least, has not gotten its share of attention by the historical writer. It is our duty to see that this situation is changed in the direction of a more wholesome understanding and respect for a time honored profession.

During the past year or two your Chairman has been engaged in compiling the doings of the Section, chronologically into three divisions as follows: (1) The minutes of all the sessions, (2) the resolutions passed upon and (3) the titles of all papers presented before the Section together with their authors. It must be understood that no claim to absolute accuracy is made in these compilations. They are offered to the historian as a beginning, or as an aid in the assembling or tabulating of the work of the Section into a more readily available form than we now have.

RECOMMENDATIONS

Your Chairman wishes to recommend

(1) That the Historical Section ask for the appointment of a committee of three to be made in the regular way, whose duty it shall be to study the history of pharmacy courses now being offered in our schools and colleges, giving special attention to the scope, time and contents of such courses, and to bring a report of its findings to our next annual meeting.

(2) That the AMERICAN PHARMACEUTICAL ASSOCIATION by proper means, classify, edit and publish the papers which have been presented before the Historical Section in an effort to create interest in the subject of the history of pharmacy and to make more readily available the information contained in the papers which have been presented from time to time.

REFERENCES

(1) Sarton G. 'History of Science and the New Humanism' (1931)

(2) Stubbs S. G. B. and Bligh, E. W., "Sixty Centuries of Health and Physic" (1931)

- (3) Milton, G. F. "History as a Major Sport," *Sat. Rev. Hist.*, 14, No. 5, page 4 (June 1935)
- (4) Seelig, M. G., "Medicine, an Historical Outline" (1931)

(The records prepared by Chairman Lee are comprehensive and valuable and will serve a useful purpose. They represent research which should, as far as possible, be made available—**HISTORIAN**.)

The following resolution was approved by the Section

RESOLUTION FROM HISTORICAL SECTION TO THE HOUSE OF DELEGATES

It is recommended by Chairman Lee

(1) That the Historical Section ask for the appointment of a committee of 3, to be made in the regular way, whose duty it shall be to study the history of pharmacy courses now being offered in our schools and colleges giving special attention to the scope, time and contents of such courses and to bring a report of its findings to our next annual meeting

(2) That the AMERICAN PHARMACEUTICAL ASSOCIATION, by proper means, classify, edit and publish the papers which have been presented before The Historical Section, in an effort to create interest in the subject of the history of pharmacy and to make more readily available the information contained in the papers which have been presented from time to time

H. W. YOUNGKEN, *Secretary*

REPORT OF THE SECRETARY

BY HEBER W. YOUNGKEN

Your secretary has sent out letters to about 250 members, soliciting papers and, in addition, has seen to it that due notices of the meetings have appeared in the *JOURNAL OF THE ASSOCIATION*. It is gratifying to note the fine response to his solicitation and especially the varied character of the topics which were selected by the contributors to this year's program of the section.

It has been a genuine pleasure to him to have worked with such helpful and enthusiastic associates as Chairman Lee and Historian Eberle.

The report was accepted

The Report of the Historian was presented. It follows

REPORT OF THE HISTORIAN

BY E. G. EBERLE

This is an eventful year for pharmacy in Europe and it is unfortunate that American pharmacy is not represented as it should be, partly due to the sudden illness of Charles H. LaWall, a former president of the AMERICAN PHARMACEUTICAL ASSOCIATION, who was named as a delegate to the pharmaceutical meetings in Brussels and by the U. S. Treasury Department to attend the sessions of the Committee upon Uniform Method of Opium Assay, in Copenhagen, which has been working under the auspices of the Health Committee of the League of Nations since 1931.

The ninth general assembly of the International Pharmaceutical Federation was held in Brussels on July 29th and 30th, and the International Congress of Pharmacy from July 30th to August 6th. The Eighth International Congress of Military Medicine and Pharmacy was convened in Brussels from June 27th to July 3rd. Among the subjects considered at the latter were

'Principles of Organization and Function of the Medical Service in Mountain Warfare,' 'Determination of Aptitude for the Various Specialties in the Medical Services of the Army, Navy and Air Force,' 'Sequelæ of Wounds of the Abdomen,' 'Researches Concerning Standardizations of Methods of Analysis of Foods and Drinks for the Use of the Soldier,' 'Buccal Dental Prophylaxis at the Front,' 'Comparative Study of the Medical Administrative Services of Various Armies, Navies and Air Services.'

The following titles indicate the work of the Congress of Pharmacy

"The Standardization of Oestrin and Male Hormone"

"The Stability of Strophanthin Solution"

"Structural Standards for Crude Drugs"

"Halogen Analogues of Ephedrine and Adrenaline"

"A Critical Study of the Methods of Assay of the Alkaloids in the Official Preparations of Belladonna in the Belgian Pharmacopœia, 1932 "

"Research on the Sterilization and Biochemical Control of Pharmaceutical Products "

' Criticisms on the So called Chemical Reactions of Cannabis Indica "

' The Problem of Unifying Pharmaceutical Nomenclature in an International Pharmacopœia '

Among the subjects that will be considered at the Twelfth International Congress are the following The medico pharmaceutical scope, the limitation of pharmacies, pharmaceutical regulations—control of patent medicines and prices to be charged, management of pharmacies pharmaceutical service in social insurance, the question of employment in pharmacies, pharmaceutical terms

The King and Queen of Belgium will attend the opening meeting of the pharmaceutical conventions

Through the courtesy of Major General H L Gilchrist, editor of the *Military Surgeon*, the Library of the AMERICAN PHARMACEUTICAL ASSOCIATION has received reports on the Congress of Military Medicine and Pharmacy for 1923, 1925, 1927, 1929, 1931 and 1933 All of the foregoing reports were made by William Seaman Bainbridge, Captain M C F, United States Naval Reserve These meetings were held consecutively in the order given above, in Rome, Paris, Warsaw, London, The Hague and Madrid

THE AMERICAN PHARMACEUTICAL ASSOCIATION in the American Association for the Advancement of Science is a step in progress and is entitled to mention in this report An interesting program was carried out at the Minneapolis meeting in Section N (Medical Sciences and Section N3 (Pharmacy)) Reference is made to page 328 of the April JOURNAL

The Pharmacy Exhibit was brought to a close as far as the Chicago World's Fair is concerned and report will be made by Chairman H C Christensen but a mention should be made as part of history

Esther H Barney, who so efficiently supervised the exhibit, donated a beautiful framed picture of it in color Council action will be taken on her valuable services and others who were outstanding in their activities

In conformity with the general plan of A Century of Progress, the Pharmacy Exhibit was arranged to appeal to the layman, and under the direction of Chairman H C Christensen and the committee having the arrangements in charge the exhibit successfully met the test, attracted the interest of the visitors and received general favorable comment from them

Brazil gave recognition to the Exhibit by presenting the AMERICAN PHARMACEUTICAL ASSOCIATION with a Diploma The writer does not anticipate Chairman Christensen's report but the exhibit or part of it will find place in the Museum of Science and Industry the Rosenwald Museum in Jackson Park Chicago

The Stabler-Leadbeater Apothecary Shop now the property of the AMERICAN PHARMACEUTICAL ASSOCIATION, will be converted into a museum, some work in the restoration has been done, but is only a beginning the front now gives an idea of the appearance when the founder established the Apothecary Shop

The Interest of collectors in drug jars is shown in the exhibition at the American Art Association—Anderson Galleries of the collection of the late John Wanamaker The latter display was in the home of Mr Wanamaker on shelves which have been brought to the Museum, the containers are traced back to the Middle Ages and were made at the great pottery works of that period By sales these are now at various places and would serve a better purpose if a selection would be permanently exhibited in the Museum of the AMERICAN INSTITUTE OF PHARMACY A number of articles on mortars have been published in the JOURNAL since the last meeting of the ASSOCIATION

The *Bulletin de la Societe d'Histoire de la Pharmacie* (France) for March presented a statement from the pharmacy of J B Caventou for ' La Dame aux Camelias ' from the collection of P Lemay The bill head carries the inscription and face of the medal of award by the Royal Institute of France of the grand prize for the discovery of quinine sulphate by Pelletier and Caventou There is further interest attached because only two of the novels of Dumas, the younger, survived one of these ' La Dame aux Camelias ' from which book came the immortal drama by the same title

Through a grant from the Carnegie Corporation and with the coöperation of the School Art

League, the Folk Arts Museum at Riverdale is open to the public, Mrs Eli Nadelman is the director Walter Rendell Storey contributed an illustrated article to the *New York Times Magazine* for April 28th on the museum, in which are ensembles of furnishings, including an early American Pharmacy, with shelves counters bottles, jars, some still full of old herbs and drugs Other types of displays are described

The Academia Nacional de Medicina of Madrid celebrated recently its second centennial The festivities included several meetings during the medical week and an exhibition of the books of the library, which has among other books of great importance, the "Codex scientie medicine of Avicenna," in five large volumes and a collection of books written by Hipolito Ruiz on American plants, which for more than three centuries were a source of information for botanists and designers from all over the world

The library of the AMERICAN INSTITUTE OF PHARMACY is developing and members have an opportunity in aiding this service by the donation of books pertaining to pharmacy and allied sciences The library has rendered service to divisions of the Government and departments have found desired information in its volumes, also individuals and schools The mails frequently bring requests for information and it is gratifying that in most instances it has been possible to render service

The History of Science Society held its December meeting in the AMERICAN INSTITUTE OF PHARMACY and for this occasion several show case displays were arranged of books dealing with the history of pharmacy which attracted the attention of the visitors and interested them A related effort in display was made when the Round Table Medical Club held its January meeting in the building, a number of changes were made in the display and this was held over for the visit, on February 9th of Phi Delta Chi delegates to the conclave in Baltimore hailing from Massachusetts, New York, Nebraska Maryland, Ohio, Iowa, Idaho Kentucky, Colorado, North Carolina, Oklahoma New Jersey and California

Dr C A Browne, chief of chemical and technological research of the United States Bureau of Chemistry and Soils has officially established 1635 as the date of the birth of American chemical work Then John Winthrop Jr, founded the industries that are now so vital to national defense and form so large a source of national wealth

The centennial of graduation from University of Georgia by Crawford W Long physician pharmacist was celebrated in Athens March 30th Many references to him may be found in the JOURNAL, among them 13, 51 (1924) 15, 317 (1926) 17, 517 (1928)

The 30th annual meeting of the American Association of Museums was held in Washington D C, headquarters at the Smithsonian Institution, May 23-25 1935 The AMERICAN PHARMACEUTICAL ASSOCIATION is listed among the museums in Washington

Golden anniversaries were celebrated this year by North Dakota Pharmaceutical Association Chicago Retail Druggists' Association Tennessee Pharmaceutical Association

These references could be carried along for many pages, but in this report must be limited, and re reading of JOURNAL articles will serve for more extended research

The articles by Lyman F Kebler and F W Nitardy recently published, emphasize the important part that the AMERICAN PHARMACEUTICAL ASSOCIATION had and has now in Pure Food and Drug Legislation

A recent Supreme Court decision makes an historical reference to the drug codes It evidences that the drug industries and pharmacy were eminently successful in the management of the respective offices

DONATIONS

The preceding Historian's Report reported earlier donations and items in the JOURNAL speak of others In an effort of this kind there is a possibility of omitting some that should be mentioned Thanks are extended to all who favored the Museum and the Library recognition is given in the JOURNAL and an appeal is made for historical matter and books for the Library Since last report and not published the ASSOCIATION has received from Mrs Harvey W Wiley a number of books and Pharmacopoeial circulars and letters of the years during which Dr Wiley was president of the Pharmacopoeial Convention The donation by Will of Frederick B Kilmer is made of record in Council Letters and official action has been taken A donation for a complete projectoscope has been made by Mr and Mrs J C Peacock, reported by Council

IN MEMORIAM

The following have served pharmacy and record is hereby made of work well done, in memory of the deceased we pause for a moment, among them are George F Bigham, W E Bingham, Charles M Blaney John Block, W L Cliffe, Charles I Clough, Edward S Dawson, Joseph H Dow, R G Eccles, P J Garvin, Raymond Hendrickson E D Irvine, Hugo Kantrowitz H C Kassner, Ervin F Kemp, Ezra J Kennedy, F B Kilmer Robert R Lampa, Robert H Land, Herman A Metz, Otto Paul Meyer, Willard Ohliger, Roy C Reese, J Percy Remington, Van Amburg Sandles, J P Schoenthaler, Israel Shurtleff, E B Shuttleworth C P VanSchaack, L S Williams, Smith C Wilson The passing of five faithful State officers was reported in one issue of the JOURNAL December 1934

The names are given in alphabetical order, brief notices are printed in the JOURNAL

Mention is made of the following, because of prominence in pharmacy in other countries or of their relation to pharmacy A H Jenkin, treasurer of the British Pharmaceutical Society, John E Graff, one of the founders of Rhode Island College of Pharmacy, Dr Philipp Fischels, father of the President of the A Ph A, Edgar A Ridgely, president of Indiana Pharmaceutical Association, Hon Clyde Kelly, friend of pharmacy, Dr Wilhelm Kolle, director of the State Institute for Experimental Therapy and Chemicotherapy Research Institute Frankfurt, Dr L Winkler, president of the Society for the History of Pharmacy and lecturer for History of Pharmacy University of Innsbruck, Marion Dorset, biochemist, Dr Hugo DeVries, world famous botanist

The report was received for publication

The following papers were read "A Brief History of the Drug Code," E F Kelly (Published in September JOURNAL, pages 767-770) "Pharmacy and a Commemorative Stamp," illustrated by lantern slides, F A Delgado "The First Pharmacist in North America," Theodore J Bradley "William Withering and the Introduction of Digitalis into Medical Practice" Louis A Roddis "Moses Maimonides, Physician and Author of Medical Works," Louis Gershenfeld "David Henshaw—from Druggist to Secretary of the Navy," George E Éwe "John Marsh, a Medico Pharmaceutical Practitioner on Six Frontiers," Edward Kremers "Early Drug Stores in Oklahoma," Loyd E Harris "The Pharmacopœia of 1880," L M Parks "The Massachusetts Pharmacopœia of 1808," H Niles "The Californian Indians, Their Medical Practices and Their Drugs" John Culley "Estonian Pharmacy," Rudolph Wallner "Development of Pharmacy in West China," E N Meuser (Published in the October JOURNAL, pages 865-867)

The Chairman appointed a Committee on Nominations

SECOND SESSION

The Second Session of the Section on Historical Pharmacy was convened by Chairman C O Lee, August 8th, at 9 00 A M

The reading of papers was continued

The first paper was "State Association Secretaries arranged in order of service," by J G Beard (Read by title, no discussion)

The next paper was "Medical Practices of the New England Indians," by Will T Bradley (Son of Dean Theodore J Bradley)

Theodore J Bradley said there are two papers on Indian Medicine in the extreme ends of the country—this, and one by John Culley entitled "The California Indians Their Medical Practices and Their Drugs"

Mr Bradley commented on the paper and the research in preparing it He hoped a paper on Southwestern Indians would be presented next year

E H Niles suggested that these papers should be published in book form

Several members expressed a hope that these papers would be published in the JOURNAL Theodore J Bradley stated that if the paper by Will T Bradley is not published, he would see to it that it is printed and distributed to those interested in the subject

Reference was made to the records prepared by Chairman Lee and the valuable information contained in unpublished papers, hence, an effort should be made to publish them for the courses in historical pharmacy

The papers were accepted

'Pioneers of Pharmaceutical Education," by E T Stuhr, was read by title

The following papers were read by title "A History of Dentifrices," Martha E Faulk "Apothecary Shops of Colonial Times" Millicent R LaWall "Medicine Making as Depicted by Museum Dioramas" Charles Whitebread "Honoring Age and Service," John E Kramer "Report of the Pharmacy Exhibit for 1933 and 1934" H C Christensen "Drugs of the Bible" A R Bliss, Jr "The Ancient Medicinal Uses of Gems and Precious Stones," A R Bliss, Jr

"History of the Dorfinger Show Globes" was presented by R W Rodman The comment by the author is abstracted from the reporter's notes I prefer to tell the story than present a formal paper, which I will prepare for the JOURNAL in the form of an article, with illustrations I have some which I must return and must have them copied to submit with my paper to you My story is nowhere near as profound as the one just heard from Dean Bradley It is a very simple story, one which has been of considerable interest to me, and I hope it will be to you

There is an old glass factory which is now in decay, that was started by one John Dorfinger in 1852 He set up his first glass works in New England in 1863 Fine glassmaking interrupted his retirement and he set up a small factory which rapidly grew until it consumed a space of over an acre of land That glass factory grew to be one of the finest glass factories in this country, it made fine glass etchings The design of the Cuban Palace occupied the full time of twenty glass blowers and etchers to complete that set of dishes He also made glassware for Royal families in England

"The great war interrupted the activities in the plant but it was not until after 1921 that the factory was closed One son bought the entire plant and stock of glassware which was left from the other heirs and decided to set up a small antique glassware shop One entire section was filled with these beautiful apothecary show globes, at a period in American Pharmacy when the show globe was not enjoying a place in the affections of the people where it finds itself to day There was no market for show globes Consequently, it was a problem what to do with these show globes—pack them up and count them as a loss or was there something he could do with them? He thought the matter over for a few months before he could devise a plan of realizing any money from them at all Then he got an idea He went to New York City to John Wanamaker's and talked with a buyer and interior decorator They planned together to separate the globes filling the bottom one with fluid and wiring them for living-room lamps, and the small ones they converted into boudoir lamps They put them on display and they had a ready appeal to the public, and within six months the entire stock of these gorgeous Dorfinger show globes had been converted into lamps and reached the homes of American families Shortly after all the show globes had been disposed of pharmacy had a demand, and druggists who did not have show globes wanted them Such a demand had been created for them that they were sold to Wanamaker for about a dollar apiece and to day they cannot be purchased for \$50.00 a pair In the L S Williams collection they have a number of these bottles and in the paper which I present to the ASSOCIATION I will have considerable technical material which will enable anyone to identify the Dorfinger show globes'

H C Christensen presented a synopsis of a paper entitled 'Report of the Pharmacy Exhibit for 1933 and 1934' He had brought a whole book full of historical documents and entitled this Part One of the Pharmacy Exhibit

Secretary Christensen said his idea was to 'carry on' and the report he presented speaks of the origin of the idea and general outline of the plan Photographs are included with notations on what they represent and their part in the exhibit There are also included lists of contributors and of the revisions in the pharmaceutical activities represented also releases sent to the publications at different times for publicity and a number which carried descriptions of the Fair

There are photostatic copies of reprints, comments on the exhibit from various papers and especially those of Chicago There are also included circulars in which the Pharmacy exhibit is mentioned The exhibit was part of the Medical Science Division in the Hall of Science, where it received recognition on an equal basis with other sciences and the exhibit was pointed to as one of the most interesting and attractive in the Building

Dr Eben Carey in charge of the Medical Division included in his description publicity articles sent out relating to the Pharmacy exhibit and referred to it by saying that the AMERICAN PHARMACEUTICAL ASSOCIATION would show the development of Pharmacy

The Catalog is included in the Hall of Science in which the Pharmacy exhibit was listed,

with the cut of the exhibit shown in the book, together with an article on it. There are other matters of interest which will be added from time to time.

The Pharmacy exhibit has been included with sixteen other medical science exhibits to be installed permanently in the Museum of Science and Industry in Jackson Park where the 1893 Fair was held.

Mr. Rosenwald, who died several years ago, endowed this institution with about \$2,500,000 and the city of Chicago voted an equal amount. In that division of the Museum there will be the sixteen medical science groups represented and the privilege is given to add to, from time to time, and make such changes as may be necessary. The set up will be along the same lines with the historical division. There will be a modern prescription and chemical counter and other exhibits that were shown at the Fair. The arrangement will be somewhat different. There will be included the old Phlo Carpenter pharmacy and old utensils will be shown within the log cabin. The Chicago Historical Society has agreed to help with the proposition, they have pictures and plans of the old store and a good many of the things that were in the store.

The original plans of the Exhibit were based on about \$50,000.00 but this estimate could not be reached. From the amount collected there is left \$596.92, which will be used in the preliminaries of installing the exhibit in the permanent museum. The Museum, however, will take over all the expenses. There will be no charge for space and nothing for the installation. It will be permitted to place from time to time other historical material. Some of this may have to be paid for, the amount therefore, has been left open so that the preliminary expenses can be met. The idea of the Exhibit was first mentioned in the Chicago Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION.

The resolution for preparing the Exhibit was passed at a special meeting by a motion directing that the AMERICAN PHARMACEUTICAL ASSOCIATION have supervision. In 1930, as President Mr. Christensen appointed delegates for the different national associations and another meeting was held to talk over preliminary plans and purposes and a committee was appointed, of which he was made *chairman* and he was given permission to go ahead with the proposition.

The report up to now is considered as the first part and additional matter can be added to from time to time. The report was accepted.

Being asked whether the report will be published in book form, Mr. Christensen said that perhaps when the report is complete this will be done.

The Museum has between ten and twelve acres of floor space, part of the exhibit material has been temporarily placed, next to the office of the National Association Boards of Pharmacy.

Mr. Christensen said that few realized fully what this exhibit really has meant. It has been recognized on the same basis with those of other sciences and now has been placed or will be placed permanently, in an institution where the exhibit of Pharmacy will be seen by millions of people. He mentioned that a million and a half of people visited the exhibit, of which there were 110,000 registered pharmacists, physicians and dentists. There were registrants from every state in the Union and from twenty six foreign countries. There were notables from various foreign countries and it represented a strenuous effort for the Local Committee to make the proposition worth while. He hoped the material may at some time be published in book form.

The report was accepted.

The following papers were read by title: "The Pharmaceutical Museum at the University of Minnesota," F. J. Wulling, "Mandragora," W. H. Blome.

Chairman Lee stated that Secretary Youngken had a paper he would like to present and he was asked to read it.

The secretary stated that the paper had been given to him by the Historian. It represented a rather rare and most valuable contribution to the history of drugs and for that reason it was presented here. Accompanying the paper were two pamphlets concerning the "Badianus Manuscript," an Aztec Herbal 'Codex Barberini' Latin 241 (Vatican Library) prepared by Dr. Emily Walcott Emmart of Johns Hopkins University. (The paper is published in the September JOURNAL, pages 771-774. See also October JOURNAL, page 928.) Chairman Lee said in accepting the paper that this is an interesting account of pharmaceutical history. He regretted that not more of the authors were present to read their papers.

The report of the Committee on Nominations was presented by Chairman Edward H.

Niles as follows *Chairman*, H W Youngken, *Secretary*, Loyd E Harris, *Delegate to the House of Delegates*, C O Lee, *Historian*, Eugene G Eberle

There being no further nominations, the nominees were duly elected by unanimous vote

Chairman Lee congratulated Chairman elect Youngken and acknowledged his services as secretary The latter expressed his appreciation of the work done by the retiring Chairman

E H Niles suggested that all authors present their papers in duplicate

C O Lee suggested that the duplicate copy might be bound in heavy paper and that this copy be used for loan to teachers and others

Chairman Youngken referred to copies on various subjects prepared by the Department of the Interior

Reference is here made to the compilations of Resolutions of the Section from the time of its organization and of the Resolutions The compilations cover many papers and are in the hands of the Historian The statements relative thereto signed by Chairman Lee follow

MINUTES, HISTORICAL SECTION OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, in brief including recommendations, motions and the titles of papers with the names of the authors, in so far as we have been able to find them

This work has been done in an effort to assemble, chronologically, the doings of the Section since its organization in 1903 up to and including the 1934 meeting

It is suggested that these are not without error and should not be accepted as final without being carefully checked and re edited

RESOLUTIONS HISTORICAL SECTION OF THE AMERICAN PHARMACEUTICAL ASSOCIATION These resolutions have been assembled chronologically in an effort to make it easily possible to know the past actions of the section There are doubtless many errors and omissions They are offered for whatever value they may serve

Motion was made and duly seconded that the Section on Historical Pharmacy adjourn—
Carried

PLANT SCIENCE SEMINAR

The thirteenth annual meeting of the Plant Science Seminar was held in Portland, Oregon, the week of July 29, 1935 Sessions were held at the North Pacific College of Oregon with Chairman Frank H Eby presiding Dean A O Mickelsen of the North Pacific College gave the address of welcome

The regular sessions were devoted to the reading of papers and round table discussions on cultivation of medicinal plants, teaching methods, laboratory technique and other subjects interesting to those engaged in the study of medicinal plants

The following papers of unusual interest were presented, "An Economical and Safe Apparatus" by Bernard Melkon, 'Studies on Phytolacca I Morphology of Young Inflorescence' by E H MacLaughlin, 'The Importance of the Library in Teaching Pharmacognosy' by Frank H Eby, 'The Kilmer Memorial Garden' by Marian S Dunn, 'Digitalis Assay' by E B Fischer Each of these papers was followed by a general discussion

Professor Ernst T Stuhr of the Oregon State College School of Pharmacy, gave a very fine address on Commercial Drug Plantings in Oregon By means of an excellent set of maps he explained the climatic and soil conditions of the entire state of Oregon He discussed the cultivation of Cascara Ginseng, Hydrastis, Mints, Artemisia, Hops and other drug plants Professor Stuhr stated that Cascara is being cultivated on a very small scale Ginseng and Hydrastis are cultivated chiefly in the region of Escatawa Digitalis flourishes as a weed through much of the eastern area of the state Artemisia and the mints are cultivated only in small areas

Professor E N Gathercoal discussed a series of studies which have been conducted on Senega and Poplar Buds in the University of Illinois, School of Pharmacy A very interesting set of charts, drawings and photomicrographs prepared by Professors E H Wirth and P D Carpenter were placed on display and discussed by Professor Gathercoal A model of a section of the wood area of a typical Senega root prepared by Professor Carpenter was the outstanding exhibit of the Seminar

The field trips of the 1935 Seminar meetings were of unusual interest because of the various

parts of the state which were visited. Trips were made to Portland Parks, the Lambert Gardens and the Leach Gardens. The Leach Gardens, founded by Mr J Leach, a retail pharmacist of Portland, were of unusual interest because of the large collection of medicinal plants under cultivation. An extensive collection of trees and shrubs of the northwest were also viewed in this garden.

At Estacada the Seminar members made a tour of the Ginseng and Hydrastis farms. In this region about fifty farms are devoted to the cultivation of these plants on a commercial scale. Representatives of the Ginseng and Hydrastis Growers Association conducted the tour and discussed problems of cultivation and other details of interest.

Two days were devoted to an extensive field trip which carried the members from Portland to Corvallis and return. The trip was made by auto and it covered one of the most beautiful sections of Oregon. The flora of the coast region in the vicinity of Newport was studied as well as that further inland on the coast range. *Digitalis* was seen flourishing as a weed along the roadside and in fields for many miles west of Corvallis. At Corvallis Dean Zieffe conducted the members on a tour of inspection through the School of Pharmacy of Oregon State College and members of the School of Forestry conducted a tour over the campus of the College. One of the finest collections of Conifers in America was viewed and a number of buildings were inspected including the School of Forestry, the Museum, Student Memorial Building and the Herbarium. A short trip from Corvallis brought the members to the Peavy Arboretum where *Cascara* and many other interesting plants were seen under cultivation. On the return to Portland the Seminar members passed through the Willamette valley where Mint and Hop farms were inspected.

The closing business session of the Seminar was held at the Multnomah Hotel on Friday evening. F J Bacon, Western Reserve University, was elected *President* for 1935-1936. A W Matthews, University of Alberta, Edmonton, Canada, was elected *Vice President* and E H Wirth, University of Illinois, 701 So Wood St, Chicago, Ill., was elected *Secretary-Treasurer*. Professor Frank H Eby and Dean Wm B Day were appointed members of the Executive Committee. Resolutions were unanimously adopted expressing the thanks of the Seminar to A O Mickelsen and E T Stuhr for their cooperation in arranging details of the program which proved to be one of the most instructive and valuable in the history of the organization.

The following members and visitors were in attendance at the thirteenth annual meeting of the Plant Science Seminar: Charles F Mollett, Mrs C F Mollett, E N Gathercoal, Mrs E N Gathercoal, Frank H Eby, Mrs Frank H Eby, F Hobart Eby, F A Gilfillan, L C Britt, Wm B Day, Mrs W B Day, A Zieffe, Marin S Dunn, Mrs M S Dunn, J Nichols, Mrs J Nichols, John Seybert, Mrs J Seybert, E B Fischer, Mrs E B Fischer, A W Matthews, A O Mickelsen, Ernst T Stuhr, Mrs E T Stuhr, H V Arny, Mrs H V Arny and Mr McMurray.

Plans for the 1936 sessions will be announced at a later date.

COMMITTEE REPORTS*

REPORT OF THE COMMITTEE ON HORTICULTURAL NOMENCLATURE

Substantial progress has been made by this committee upon the list of names of drugs, spices and medicinal and dye plants which it is compiling for inclusion in the second edition of *Standardized Plant Names*. Your chairman has sent out copies of lists compiled from the U S P, N F and Part II of the U S D to Committeemen Gathercoal and Ballard for further checking and decision upon the names of items appearing in these works which are to be included in the ASSOCIATION List.

The list, when completed will contain a single name for every vegetable drug, spice or dye, a single botanical name for each plant yielding these and a single synonym for every item for which a common name has been employed.

Our next task will be that of studying the names on wholesalers' lists of drugs, spices and dyes and including such as are not represented in the present lists.

* For action, see Abstract of Minutes, House of Delegates, pages 911 and 912, October JOURNAL

Some expense will be entailed for postage and secretarial assistance during the completion of the work. Accordingly we recommend that an appropriation of \$20 00 be set aside for the use of this committee in completing the work on the ASSOCIATION List—(see October JOURNAL page 911)

(Signed) C W BALLARD, E N GATHERCOAL H W YOUNGKEN, *Chairman*

REPORT OF COMMITTEE ON WEIGHTS AND MEASURES *

Since the Committee on Weights and Measures began a survey to find out the accuracy of the scales weights and measures used in drug stores and reported their findings at our last meeting it appeared logical for the committee this year to continue along the same lines. The material previously collected was at the disposal of the committee and inquiries were again directed to the various state agencies, with special attention to those states not previously reporting to find out what supervision was exercised and the findings concerning the number of scales and weights examined, passed, adjusted and condemned wherever it was possible to obtain this information.

Six states, Colorado, Georgia, Idaho, Rhode Island, South Carolina, West Virginia gave no response to our efforts and there is nothing in the material previously collected to throw any light upon the situation that may exist in these states.

Twenty-four states exercise practically no supervision or control of pharmacists' scales and weights. Of this number, Arkansas, Florida, Louisiana, Mississippi, Missouri and Oklahoma have no departments of weights and measures and evidently there is no provision by law whereby any existing state agency may supervise, although in Oklahoma the University does somewhat. Alabama and Oregon have made provision for inspection and testing and will do so hereafter. In New Hampshire, North Carolina and Utah testing is done upon request or complaint only. In Maryland and Virginia the cities of Baltimore and Richmond exercise control. In New Mexico it is the duty of the local sheriffs to test scales. Illinois and Nevada report lack of personnel which satisfactory supervision requires and Minnesota has discontinued this work because of lack of funds. In Indiana, Kentucky, Montana, North Dakota, Ohio, Texas, Washington and Wyoming the departments of weights and measures are inactive without any reasons given.

Eighteen states and the District of Columbia report satisfactory supervision under existing laws by Boards of Health, Departments of Agriculture or Weights and Measures Departments but no separate record was kept or supplied for the testing of pharmacists' scales as a class in the states of Arizona, California, Connecticut, Delaware, Iowa, Kansas, Maine, New York, South Dakota, Tennessee, Vermont and Wisconsin. In Massachusetts, it is compulsory to have weighing and measuring equipment tested. Vermont laws provide specifications for two classes of drug scales and tolerances for each class. Massachusetts, Michigan, Nebraska, New Jersey, Pennsylvania and the District of Columbia supplied information concerning the number of scales and weights tested, number found correct, number adjusted and number condemned as follows:

Massachusetts—1790 scales approved, 78 condemned, 30,203 weights approved, 393 adjusted, 552 condemned.

Michigan—2516 scales approved, 44 condemned, 21,480 weights approved, 1138 condemned, 7623 graduates approved, 29 condemned.

Nebraska—667 scales approved, none condemned.

New Jersey—844 scales approved, 15 adjusted, 20 condemned, 20,475 weights approved, 1137 adjusted, 1862 condemned.

Pennsylvania—163 scales approved, 14 condemned, 279 weights approved, 22 adjusted, 21 condemned.

District of Columbia—350 scales approved, 48 adjusted, 16 condemned, 6940 weights approved, 92 condemned and confiscated.

Comments from these states indicate conditions are improving with regular inspection being done, but according to the present record 3 per cent of the scales examined were unfit and 1 per cent required adjusting, while $4\frac{1}{2}$ per cent of the weights were unfit and 2 per cent required adjusting. If this percentage of these important devices is inaccurate in states where constant supervision is exercised conditions generally as to pharmacists' scales and weights must be very bad especially in those thirty states that do not concern themselves about it.

* See October JOURNAL, page 911

There is evidenced in the survey thus far an apparent lack of interest or failure to evaluate properly the importance of the pharmacists' weighing devices by the departments in some states which are charged with supervision over weights and measures. The testing of weights and measures in pharmacies should and could be best done by Boards of Pharmacy or Boards of Health, but it is eminently of first importance that it be done by any state agency rather than be left undone. It is suggested that the attention of the various Boards of Pharmacy be directed to the unhealthy situation which prevails and that more emphasis be placed upon the importance of standard equipment to insure accuracy in compounding and dispensing. The importance of and necessity for this is well established and it is desired that the proper state agencies be awakened to their responsibilities.

It is recommended that the incoming committee continue this survey work in order to show what progress is being made and to provide more facts and figures pertaining thereto (Signed) R P FISCHER, W MAC CHILDS ROWLAND JONES, H W PARKER, CHAS S PIERCE, P H COSTELLO, *Chairman*

REPORT OF THE COMMITTEE ON WILLIAM PROCTER, JR, MEMORIAL FUND

The Committee on the William Procter, Jr, Memorial is pleased to report that the new model for the statue which will be placed in the foyer of the AMERICAN PHARMACEUTICAL ASSOCIATION Headquarters Building in Washington has been approved by a majority vote of its members.

To be more precise the recent canvass on the submitted photographs of this model shows ten unqualified votes for the acceptance of the sketch and one vote that suggested a minor change in the design, and as soon as the sculptor returns from vacation this will have our immediate attention, and the architect will be asked to give suggestions for the base of the statue.

Until now, the work of this Committee has been conducted without the expenditure of any funds that were collected for this memorial and while we regret the unavoidable delays that we have encountered, every member of your committee realizes that each delay will prove to be an advantage for the completed work.

The Committee hopes to make arrangements for the early casting of the statue and believes that its emplacement will be an addition to the Headquarters Building and a graceful tribute to 'The Father of American Pharmacy'—See October JOURNAL page 911.

(Signed) JAMES E HANCOCK, *Chairman*

REPORT NATIONAL PHARMACY WEEK EXECUTIVE COMMITTEE *

The eleventh annual observance of the National Pharmacy Week movement will be held during the week of October 21st. The date has been changed from that of former years so as to permit Colleges of Pharmacy greater opportunity to participate in the activities of Pharmacy Week. During the course of the past years many Colleges of Pharmacy have conducted 'Open House' during Pharmacy Week, thus permitting the students from other departments the Faculty and members of the laity an opportunity of noting through the agency of demonstrations and lectures, the many advances that are being made in American Pharmacy.

This is a splendid manner in which to tell the story of Pharmacy, for at the present time our Colleges are well equipped and have many things of interest to set forth by means of demonstrations. From conversations with those who have assisted in the "Open House" events it is quite evident that the laity have but a slight appreciation of the fine work being accomplished by our Colleges of Pharmacy.

The Colleges of Pharmacy that maintain medicinal plant gardens are fortunate in that many specimens of medicinal plants can be shown on these occasions through the agency of one or more types of professional displays.

It is hoped that our Colleges of Pharmacy will cooperate to the fullest possible extent during the eleventh annual observance of Pharmacy Week. Members of the Faculty should arrange at once for the presentation of talks before various community organizations as well as for radio talks. A number of Colleges of Pharmacy have likewise been of material assistance to retail pharmacists relative to suggestions and materials for professional window displays. Certain Colleges of Pharmacy have arranged for truly worth while professional Pharmacy displays in the

* See page 911, October JOURNAL. See also page 257, April JOURNAL.

city library as well as in windows of leading stores in the town. Here is an excellent medium for a College of Pharmacy to tell its story to the residents of the community. The National Pharmacy Week Executive Committee urges the Deans and their Associates, as well as the members of the student body, to take an active and leading interest in the work of the National Pharmacy Week movement. When supported by educational institutions, the movement takes on a deeper significance than a movement in which they are not duly represented.

National Pharmacy Week Window Display Contest—As in former years there will be conducted another National Pharmacy Week Window Display Contest. The judges for this contest will be appointed by the National Pharmacy Week Executive Committee from the City of Cincinnati, the city in which the 1935 Convention of the National Association of Retail Druggists will be held. The judges will be appointed from a list of leading personages in the Drug Trade Industry of that city and will include a representation of the scholastic world, manufacturers, wholesalers, editorial field and of course retail pharmacists.

Robert J. Ruth Memorial Trophy—Secretary Lee Williamson, of the Federal Wholesale Druggists' Association has informed the chairman of the National Pharmacy Week Executive Committee that his association will again donate a beautiful silver loving cup which has been designated as the Robert J. Ruth Memorial Trophy, thus honoring the founder of the Pharmacy Week movement.

To date this beautiful trophy has been awarded to the following for the best professional window display in the years as designated:

1931 Haussman Pharmacy Philadelphia, Pa.

1932, John O'Brien Drug Company, Omaha, Nebraska

1933, Sisson Drugs, Inc. Chicago, Ill.

1934, Apothecaries Hall, New Haven, Conn.

Kindly bear in mind that this beautiful trophy becomes the permanent possession of the winner each year. There seems to be some misunderstanding on this point, notwithstanding that the pharmaceutical press has made frequent mention of same.

State and Local Prizes—In addition to the Grand Prize, numerous prizes are likewise offered by state and local organizations, which in the majority of cases likewise become the permanent possession of the winner.

Honorable Mention Certificates—Ten honorable mention certificates will be awarded jointly by the AMERICAN PHARMACEUTICAL ASSOCIATION and the National Association of Retail Druggists for the next best ten professional window displays in the National Pharmacy Week Window Display Contest, thus affording a greater number an opportunity to share in the national awards.

Pharmacy Week Maps—The National Wholesale Druggists' Association has a number of the medicinal plant maps of the United States as well as maps featuring the work of our Colleges of Pharmacy on hand. These are prepared under the direction of Dr. E. L. Newcomb and associates and should find ready acceptance on the part of retail pharmacists for professional window displays as well as for gifts to be presented to local educational institutions. Departments of Biology, Botany and other departments of educational institutions will gladly welcome receiving a copy of these maps. Retail pharmacists are urged to place an order for these maps through their service wholesaler. Many retail pharmacists have presented copies of them to educational institutions and the reaction has been most favorable.

The Pharmaceutical Press—The pharmaceutical press has given the National Pharmacy Week movement splendid support to date. A number of these journals edit special Pharmacy Week numbers that are a real credit to the profession of Pharmacy. It is hoped that this splendid support will be continued in the future and that we may be privileged to receive 1935 special Pharmacy Week editions of these journals.

Editors of pharmaceutical journals are always face to face with the problem of securing worth while articles for publication. The National Pharmacy Week Executive Committee urges all those who are in a position to write interesting articles to cooperate with the pharmaceutical press to the fullest possible extent.

Perhaps you are acquainted with some interesting phase of Pharmacy that as yet has not appeared in print. It would be a splendid thing if you would pause in the rush of your busy lives to express these things in writing, and then submit them to the pharmaceutical press. To date

there has appeared a résumé of Famous Discoveries by Famous Pharmacists This list is far from complete If you are in possession of additional facts, will you make it a point to send same to the pharmaceutical press or to the chairman of the National Pharmacy Week Executive Committee?

Pharmacy Week Bulletins—Owing to the fact that the chairman of the National Pharmacy Week Executive Committee was confined to his home for a period of two months this summer on account of illness, there has been a delay in sending out the first of a series of *Pharmacy Week Bulletins* to the pharmaceutical press, to members of the Committee as well as to cooperating groups Two bulletins have just been completed and should be in the mail before August 1st The first bulletin deals with a general report while the second deals with the subject of professional window displays Many suggested titles for professional window displays have been set forth in the second bulletin Additional bulletins will be prepared during the course of the next month or so and which will receive wide distribution

Finances—The present fund as made possible through the AMERICAN PHARMACEUTICAL ASSOCIATION and the National Association of Retail Druggists amounting to \$250 00 per year per association is far from a satisfactory amount Many persons in the Drug Trade Industry may wonder at times why the National Pharmacy Week Executive Committee does not prepare additional materials for distribution than have gone forward in the past When one takes into consideration the cost of mimeographing, printing and mailing, the sum of \$500 00 is soon expended The National Pharmacy Week Executive Committee expended \$498 00 during the past year and owing to lack of money was unable to comply with nearly 500 additional requests for Pharmacy Week stories

The condition is somewhat more troublesome in light of the fact that the chairman of the National Pharmacy Week Executive Committee failed to receive one donation of \$250 00 It has been necessary to curtail expenses along the line to make up this deficit as well as to make up the deficit that the chairman encountered when first assuming the office

The National Pharmacy Week Executive Committee recommends that some plan be worked out whereby the Committee will have at least \$1000 00 per year for the work of the National Pharmacy Week movement

Additional Support Needed—During the course of the past few years the National Pharmacy Week Executive Committee has mailed out thousands of copies of human-interest appeal stories to those requesting same Last year some 20 different stories were prepared in mimeograph form and which were greatly appreciated as evidenced by the extra demands for same as well as comments as received from those who made use of them Hundreds of retail pharmacists utilized these stories for presentation before various community organizations Pharmaceutical educators have embodied a considerable portion of these talks in their lectures during the course of the year

The Chairman of the National Pharmacy Week Executive Committee has personally prepared a number of these stories for distribution Requests for additional stories have gone forth to the pharmaceutical educators and others associated with the Profession of Pharmacy, but the support received was far less than had been anticipated During the course of one year but one educator a Dean of one of our Colleges of Pharmacy, responded

No doubt pharmaceutical educators have on hand copies of talks they have presented to various community groups as well as having copies of radio talks on hand The National Pharmacy Week Executive Committee gladly welcomes material of this kind and trusts that greater support will be forthcoming in the future

Value of National Pharmacy Week—It is quite evident that the National Pharmacy Week movement represents an innovation that should be continued in the future It has been a means of bringing the message of Pharmacy to the public as well as a means of encouraging retail pharmacists and others to greater professional activities, such as perhaps has not been accomplished by any other movement in the history of Pharmacy It is quite evident that a movement of this kind is essential to the development of the profession of Pharmacy The National Pharmacy Week movement has been kept within professional bounds and many suggestions have been studied and finally vetoed, so that the movement would not become commercialized

Future Developments—During the course of the past four years the Chairman of the National Pharmacy Week Committee has consulted many individuals of the Drug Trade Industry concerning the future development of the movement. Several suggested plans have been worked

out but have not been put into effect, due to the lack of finances. It is quite evident that certain changes should be made in the movement, for it has continued over a period of ten years more or less on the original setup.

The next decade should witness many interesting developments, for there is much that can be accomplished provided funds are made available to carry on this work. No attempt will be made in this report to outline the suggested activities. The National Pharmacy Week Executive Committee will await such a time when a larger annual fund has been made available, before attempting to reshape the structure of the movement.

The response to the movement on the part of retail pharmacists in connection with professional window displays during the past year was most encouraging. In fact, reports indicate that a greater activity took place last year than in a few years previous. This would appear to be indicative of the fact that pharmacists are awakening to the potential possibilities in the professional field and are giving concrete expression to these thoughts on their part by developing interesting professional window displays.

AMERICAN PHARMACEUTICAL ASSOCIATION

Anton Hogstad Jr
Edward Spease
John H. Hoagland
John O'Brien
Roy Warnack
L. M. Kantner
E. J. Ireland

NATIONAL ASSOCIATION OF RETAIL DRUGGISTS

A. V. Burdine
James P. Crowley
J. J. Gillespie
Wm. B. Zubrod
Clare F. Allan
Benjamin Cohen
Jos. H. Rosenthal
Fred G. Kustermann
Roy F. Perry
Ambrose Hunsberger

REPORT OF THE COMMITTEE ON TRANSPORTATION

Portland, Oregon
August 7, 1935

The work of the Committee on Transportation has been easier during the past year than it has been in some years because the summer tourist rates to Portland are lower than the convention rates from most sections of the country, and it was not necessary or feasible to use the certificate plan for the meeting.

The work of the Committee on Transportation, however, includes a great deal of correspondence with the railroads and the chairman must give considerable time to interviews with representatives of the various roads. It has been our policy to secure information about the available routes and rates to the Convention City and to distribute this information to the members, leaving each member free to choose the route which suits him best. Acting on this policy, studies were made of the many possible routes to Portland from different parts of the country, and summaries of the results of this study were published in notices appearing in three numbers of the JOURNAL, also many circulars giving information about routes were sent to two members by the local committee and by various transportation systems.

An efficient Committee on Transportation is an essential part of an organization like ours and the members of the present committee have tried to do their part to help insure the success of the meeting (see page 912, October JOURNAL).

(Signed) T. J. BRADLEY, *Chairman*

LEASE OF "DRY ICE" WELL

Harold L. Ickes, Secretary of the Interior, has signed the first lease in American history for the operation of a "dry ice" well. The well produces almost pure carbon dioxide and is located in Carbon County, Utah. The well was first drilled in January 1924 showing a gas content under terrific pressure of more than 98 per cent pure carbon dioxide. At that time there was no known means of utilizing the gas except locally, so that the well was plugged and temporarily abandoned.

PROCEEDINGS OF THE LOCAL BRANCHES

"All papers presented to the Association and Branches shall become the property of the Association with the understanding that they are not to be published in any other publication prior to their publication in those of the Association, except with the consent of the Council"

—Part of Chapter VI, Article VI of the By-Laws

ARTICLE III of Chapter VII reads "The objects and aims of local branches of this Association shall be the same as set forth in ARTICLE I of the Constitution of this body, *and the acts of local branches shall in no way commit or bind this Association, and can only serve as recommendations to it* And no local branch shall enact any article of Constitution or By Law to conflict with the Constitution or By-Laws of this Association"

ARTICLE IV of Chapter VII reads "Each local branch having not less than 50 dues paid members of the Association holding not less than six meetings annually with an attendance of not less than 9 members at each meeting, and the proceedings of which shall have been submitted to the JOURNAL for publication, may elect one representative to the House of Delegates"

Reports of the meeting of the Local Branches shall be mailed to the Editor on the day following the meeting, if possible Minutes should be typewritten with wide spaces between the lines Care should be taken to give proper names correctly and manuscript should be signed by the reporter *Please advise us of changes in Roster and mail reports promptly*

BALTIMORE

The October meeting of the Baltimore Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held at the Hotel Emerson on Thursday, October 31 President Reindollar was in the Chair

The minutes of the last meeting, held in April 1935, were called for and read by the Secretary President Reindollar then introduced Secretary E F Kelly, of the AMERICAN PHARMACEUTICAL ASSOCIATION, who, representing the chairman of the Scientific Section was to present the Ebert Prize for 1935 to Marvin J Andrews of the School of Pharmacy of the University of Maryland Dr Kelly mentioned the foundation of the award from the legacy of the late Dr Albert Ebert, how the first award had been made in 1874 and that thirty-nine awards had been made since that date He elaborated on the work of the recipient in regard to the margin of permissible error in prescriptions and the importance of studies of this type Dr Kelly expressed the best wishes of Dr Fischelis to the Baltimore Branch members and to Mr Andrews The presentation of the medal followed

President Reindollar introduced the speaker of the evening, Dr David M R Culbreth, Emeritus Professor of Materia Medica of the School of Pharmacy, University of Maryland Dr Culbreth, it was pointed out, has been a member of the AMERICAN PHARMACEUTICAL ASSOCIATION for a half century and present at the meeting were four generations of pharmacists Dr Culbreth selected for his topic, "How can a person be satisfied and contented while making a living and a reserve for old age in the retail Drug Business?"

The speaker delivered a scholarly address concerning his early experiences in the retail drug business, and how in his experience the young pharmacist of to day should plan his life's work Dr Culbreth mentioned the value of a thorough pharmaceutical training both theoretical and practical, and how the health of the individual should be carefully guarded as should his savings

President Reindollar said it was a rare pleasure to hear the experiences of this master pharmacist and the Baltimore Branch took great pride in counting him a member A rising vote of thanks was tendered Dr Culbreth About twenty-five attended the meeting

C JELLEFF CARR, *Secretary-Treasurer*

CHICAGO

The first meeting of the Chicago Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held Tuesday evening, October 22nd at the University of Illinois College of Pharmacy The meeting was called to order by President Morrison

The first speaker of the evening was Lawrence Templeton who told of "The A P H A Convention in Portland, Oregon, and of Pharmacy, Cascara and Salmon in Oregon"

He told of many happenings at the convention of other than a scientific nature and referred the assembly to the August issue of the JOURNAL for the scientific and business matters transacted at the convention

Mr Templeton spoke as one making his first attendance at a national convention of the ASSOCIATION and made a very flattering report of the value of attending these yearly meetings, and urged more of the members of the Chicago Branch to arrange their summer vacations so that they could attend the next meeting in Dallas, Texas

A very interesting discussion was given of the retail drug conditions on the Pacific Coast and of a visit to the first and largest Cascara Farm on the coast, which is located near Browns ville, Oregon Mr Templeton, a native Oregonian, gave a story of the habits of the salmon during their trek up the fresh-water streams to their spawning grounds

Pictures, pamphlets, newspaper items cascara berries and other miscellaneous items were passed around to enliven the discussion

The second speaker of the evening, Mr Shkolnik, spoke of "Current Topics at the N A R D Convention in Cincinnati" He first told of the social happenings at the convention and led us to believe that the Chicago delegation was well taken care of in that respect

A report was given of activities on Fair Trade bills Figures were presented to show the comparative sales profits and wages paid between the chain stores and the independent stores during the past few years The report was all in favor of the chain store having the advantage and constantly gaining a greater advantage

The speaker presented his own ideas in regard to the Fair Trade bills and looked upon it as an injustice to the public to pass bills restraining price competition His view of the matter was to pass legislation that would stop unfair price discrimination between the small retailer and the large organization True a car-load of merchandise should be purchased for less per unit but no less than the difference between the cost of handling the units in car load lots and one twelfth of a dozen or one quarter of a dozen With this system in practice Mr Shkolnik averred that we would not need laws restraining price cutting below cost as the price of an item on the retailer's shelf would be the same to all and that very few retailers, large or small, would continue to sell at cost or at a sale price that is in many cases below the wholesale price of the independent retailer

The numerous questions propounded by the large gathering testified as to their interest in the discussions of the evening

L TEMPLETON, *Secretary Treasurer*

NEW YORK

The October meeting of the New York Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held October 14th, in the College of Pharmacy, Columbia University About seventy members and their guests attended

The meeting was called to order by President Charles W Ballard The secretary read his report, which was approved

Treasurer Currens read his report, it was accepted

Chairman Lehman, of the Committee on Education and Legislation, submitted the following report

National Legislation—Congress having adjourned, without enacting the two bills of great interest to pharmacy namely the Copeland Pure Food and Drug Law, (S 5) and the Patman Bill (H R 8442) those favoring the enactment or the rejection of these two measures are continuing their agitation for or against the same In the matter of the Patman Bill, which provides for equal treatment for all distributors, great or small much activity is shown in independent retail circles All discounts and allowances in any quantity, are to be the same for the small purchaser, as well as the large one

Congressional investigation of this measure has created quite a sensation for it has shown that some of the great distributors had received special discounts, bonuses and advertising allowances from many of the manufacturers of nationally advertised merchandise This bill is endorsed by the Federal Wholesale Druggists' Association and the National Association of Retail Druggists

Demands for a national law against unfair competition are being voiced by associations of retail merchants all over the country, and an attempt to enact a Fair Trade Law similar to the

Capper Kelly Bill, so long before Congress, or the various State fair trade laws that have been passed during the year, will be pushed vigorously during the coming session of Congress

Toilet preparations are subject to a 10% Federal tax they include non official lotions such as Rose-Water and Glycerine, and returns to the Collector of Internal Revenue must be made if the pharmacist mixes the same for his customer Hair-fixing lotions are among the taxable items (also known as wave setters)

Retail pharmacists must see that their stock of liquors, alcohol and tincture of Jamaica Ginger are in stamped containers, even though the preparations are used only in compounding prescriptions violations of this rule may subject them to penalties

In regard to State Fair Trade Laws The Superior Court of California recently held that the California Fair Trade Law does not violate the Sherman Act Decision rendered in the case of the Emerson Drug Co vs Weinstein Co In New York State many manufacturers of nationally advertised drug items have submitted contracts that have been approved by the New York State Pharmaceutical Association's Fair Trade Committee about thirty-five in all However, many of the larger concerns have failed to do so, and much impatience and concern has been prevalent in various sections of the state A number of mass meetings have been called, especially in Buffalo, Rochester, Syracuse and Brooklyn, to protest against the delay in offering contracts and in consequence, several more were issued A mass meeting in New York City, including the Metropolitan District was held on October 28th

A meeting of retailers with manufacturers was held on October 7th, under the auspices of the Board of Directors of the New York Pharmaceutical Council and the presidents of the various constituent associations

Any pharmacist who manufactures his own private formula or has manufactured for him, medicinal or cosmetic preparations, may have to pay \$25 00 for the registration of each one for the first year and \$10 00 every year thereafter if the New York Board of Health adopts the proposed amendment to the Sanitary Code Also disclosure of formulas, registration of labels advertising matter and submitting of samples are contemplated under the amendment the matter is in the hands of the Legislative Committee of the New York Pharmaceutical Council a meeting was held with the Health Commissioner, and a hearing has been set for December 2, 1935

Auditor Bilhuber reported that the accounts had been checked and everything had been found in perfect order

Delegate Hugo Schaefer, to the House of Delegates for the New York Branch, submitted a report on impressions gathered at the ASSOCIATION convention held at Portland

He reported that the meeting had been very well attended and that it was a very successful meeting He discussed the resolutions which had been presented by President R P Fischelis of the ASSOCIATION and pointed out that the Committee on Resolutions had acted liberally Many of the proposals made by President Fischelis were passed and it was plain that the majority of the delegates were in sympathy with his suggestions The resolution introduced by the New York Branch, relative to providing a rebate from the AMERICAN PHARMACEUTICAL ASSOCIATION to each branch for every ASSOCIATION member within its district was referred to the Council since it involved fiscal matters The feeling was prevalent that the proposal was well received and would in all probability be acted upon favorably

The Copeland S 5 Bill was approved by the ASSOCIATION

P H Costello was installed as the president of the ASSOCIATION

Dr Schaefer also reported that the other groups meeting at the time of the A P H A convention enjoyed a good attendance and that the scientific part of the convention had yielded a very large number of papers

Samuel C Henry, New York Branch delegate to the New York Pharmaceutical Council, reported that he had attended all meetings both regular and special since his appointment and he thanked the Branch for this opportunity to serve He explained that the Council was doing good work in dealing with the problems of the retailer The new Fair Trade Code had been widely and thoroughly discussed and some anxiety existed over the failure of manufacturers to submit contracts and failure of retail druggists to sign approved contracts A similar kind of law is now operating in nine states of the union Mr Henry urged retailers to lose no time in signing approved contracts He also reported that wholesalers had been asked by retailers to cooperate in eliminating the number of new drug stores It was felt that a new store should not be opened

until a real need for the service existed. He called attention to the special meeting to be held on October 28th, in order to arouse interest of the retailers in signing approved Fair Trade contracts. Another point discussed at Council meetings was the lack of funds available to officials for the enforcement of the State Narcotic Law.

President Ballard thanked Mr. Henry for his report and called upon Chairman Steiger of the Progress of Pharmacy Committee, who submitted the following report:

The most important items in regard to the progress of pharmacy are, of course, those in the report of our delegate to the Portland meeting.

Our "Pharmaceutical Abstracts" cannot be omitted in any discussion of the progress of pharmacy. In a few short months these abstracts have assumed an important place in the literature of scientific pharmacy. It has become difficult for your committee to make their report without duplicating the work of the abstracters.

An interesting article on odors and the sense of smell appears in the October *Industrial and Engineering Chemistry* ("Seeking a Working Language for Odors and Flavors," E. C. Crocker). Of this article the editors say, "Odors can be detected in lower concentrations by the nose than any other characteristic by almost any other instrument," according to Crocker; yet, because no satisfactory method of description and record of the sensations of smell exist, the value of this extremely sensitive instrument is practically neglected. Pleading for the better development of our language descriptive of odor characteristics, Crocker reviews what has been done in this field and emphasizes the value of further work in classifying and evaluating odors.

Drug Topics for September 16th, reports that Parke, Davis & Co. have patented a procedure for manufacturing an effective toxin, an antitoxin and a toxin-antitoxin from meningococcus germs. Merck have patented an improved method of manufacturing and isolating salts of the aliphatic acid esters of choline. Purdue Research Foundation has been assigned the patent of a process for removing impurities from virus preparations by adjustment of hydrogen ion concentration and subsequent flocculation. Metal capsules containing volatile medicaments suitable for inhalation have been patented. The capsule is made of a low-melting alloy having a melting point below that of boiling water. When the capsule is dropped into hot water it will melt and release the inhalant composition. An Ontario physician is said to have produced products which he terms "Ensols," one of which had arrested the development of Carcinoma. These "Ensols" are produced, he said, by growing harmless proteolytic organisms on protein media which are thereby liquefied. In the liquid produced he claims, is an active substance which can be separated and sterilized. This has the power of liquefying proteins similar to the base, but has no effect upon the other types of proteins. An ensol produced from a carcinoma base has a specific action on carcinoma tissues. Dr. Connell says:

In their September 30th issue, *Drug Trade News* reports a Squibb patent for the use of a glycol in making pure divinyl ether. Dr. Ruzicka announces that he has synthesized Testosterone from cholesterol. (Androsterone had already been synthesized from cholesterol)—Parke, Davis & Co. have been assigned a patent for producing a pituitary diuretic preparation.

In an article entitled "Nutrition and Vitality" in Parke, Davis & Co.'s "Therapeutic Notes" for September, the statement is made that "One cannot read any number of the important medical journals without being impressed by the increasing importance which is attached to the subject of vitamins. These elusive substances which may be accidentally included in or similarly omitted from one's diet and which are so essential to health in many ways are now the subject of study by a large and growing number of students. At first suspected of being a fad, the study of vitamins now engages the attention not only of dietitians and clinicians, but of biological research workers and chemists."

Under the heading of unfinished business, Dr. Schaeger presented a letter from the office of the Controller of the City of New York. After some discussion, Dr. Bilhuber moved that the letter be filed. This was seconded by Mr. Currens and no further action was taken.

A communication from Robert S. Lehman, signed for the New York State Pharmaceutical Association, was read. This called upon our president to appoint one delegate to be a member of the Committee on Resolutions of the State Association, for its annual convention. The president said that he would announce the appointment at the next meeting.

President Ballard called attention to the arrangements which had been made for the Remington Medal presentation in Washington and opened the whole matter for discussion. In the

discussion, Messrs Schaefer, Bilhuber, Army, Rudolf Hauck and Ballard took part. Following the discussion, it was agreed that further arrangements of the details of the Remington Medal presentation be left to the president and the secretary.

Under the heading of new business, Mr Currens submitted the Branch membership applications of Mr Stern and Dr Snyder, together with their remittances. Both gentlemen were elected to Branch membership. Dr Schaefer submitted the application of Alfred Biamonte for ASSOCIATION membership and directed the secretary to forward this to Washington.

Dr Schaefer then moved that the Branch mail cards to its members urging the election of Dr Fischelis as a member of the Council and Dr Lascoff as vice president. This motion was seconded and approved.

A member of the Branch arose and discussed the resolutions proposed for the amendment of the Sanitary Code of the City of New York which would require registration of all proprietary remedies and would require every manufacturer to pay a fee of \$25.00 for the registration of each item in the City of New York. At the close of his discussion, he moved that the Branch go on record as being opposed to this resolution. The motion was seconded and brought up for discussion.

Dr Wimmer pointed out that the Branch is a member of the National Pharmaceutical Council and that the purpose of the Council is to represent the united opinion of pharmaceutical organizations in New York City, and that since the Council had already taken steps to combat this new regulation it would be wholly unnecessary and out of place for the Branch to act independently. Dr Schaefer called attention to essentially the same point that Dr Wimmer had emphasized. The motion was then withdrawn with the consent of the member who had seconded it. This brought to a close the business part of the meeting.

President Ballard then announced that the topic for the evening was the "Manufacture of Glass." V. F. Hammel, of Whittall, Tatum Co. who had been regularly scheduled to address the Branch unfortunately could not attend and that Mr. Petid had come in his place, he was then introduced by the president. The speaker's remarks were very brief, his principal presentation being a moving picture film which very thoroughly showed the manufacture of glass and glass products. At the close of the meeting a rising vote of thanks was accorded the speaker and the meeting was adjourned.

RUDOLF O. HAUCK, *Secretary*

REPORT OF SPECIAL MEETING OF THE NEW YORK BRANCH OF THE AMERICAN
PHARMACEUTICAL ASSOCIATION HELD ON THE OCCASION OF THE PRESENTATION OF THE
REMINGTON MEDAL TO DR. SAMUEL LEWIS HILTON

The Remington Medal for 1935 was presented to Dr. Samuel L. Hilton at a dinner held in his honor at the Mayflower Hotel, Washington, D. C. on the evening of October 19, 1935.

The dinner was sponsored by the District of Columbia Pharmaceutical Association, the District of Columbia Board of Pharmacy, the District of Columbia Veteran Druggists Association, the faculty of the George Washington School of Pharmacy and the New York Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION.

Dr. Augustus C. Taylor of Washington was chairman of the Committee on Arrangement.

The toastmaster for the evening was Dr. Robert L. Swan and speakers at the dinner included, Dr. Harry A. Fowler of Washington, Prof. E. Fullerton Cook of Philadelphia, Dean T. J. Bradley of Boston, and Secretary E. F. Kelly of Washington.

When the time came for the presentation of the medal, the toastmaster introduced President Charles W. Ballard of the New York Branch who called the meeting to order. A quorum for the New York Branch was assured by the presence of more than a sufficient number of New York Branch members. After some brief introductory remarks he requested Past-President H. V. Army of the New York Branch to present the medal. In presenting the medal, Dr. Army stated how pleased the New York Branch was with the fact that so well deserving a person had been awarded the medal and extended the congratulation of the New York Branch to the recipient, who responded.

RUDOLF O. HAUCK, *Secretary*

NORTHERN NEW JERSEY

The first Fall meeting of the Northern New Jersey Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held at the Rutgers University College of Pharmacy on October 21st with President George C Schicks presiding. More than fifty members and guests attended the meeting.

Dean Ernest Little, *Chairman* of the Membership Committee outlined his suggested approach to the problem of increasing membership in the ASSOCIATION as described in the JOURNAL for September and his plan was enthusiastically received by the Branch. After several members discussed various features of Dr Little's suggestions, the Branch voted unanimously to endorse the plan, to adopt as one of its major projects for the year the doubling of its membership by August 1 1936 and to appropriate sufficient money to present a pennant each year for the next two years to the Branch showing the highest percentage gain in membership during the year.

Chairman John Silsby of the Committee on Practice of Pharmacy discussed developments of the last few months in the profession and Robert W Rodman delegate to the AMERICAN PHARMACEUTICAL ASSOCIATION Convention reported briefly on the Portland meeting.

Chairman Anton Hogstad Jr of the Executive Committee of National Pharmacy Week, delivered an excellent address on the subject of "Professional Pharmacy." Dr Hogstad illustrated his remarks with a series of lantern slides showing outstanding examples of impressive prescription pharmacies and attractive professional window displays.

Dr Robert Lee Swain of Baltimore former president of the AMERICAN PHARMACEUTICAL ASSOCIATION and present chairman of the Committee on Fair Trade Laws for the National Association of Retail Druggists will address the meeting of the Northern New Jersey Branch to be held on Monday night November 18th.

C L Cox *Secretary*

NORTHERN OHIO

The regular monthly meeting of the Northern Ohio Branch AMERICAN PHARMACEUTICAL ASSOCIATION, was held at The Faculty Club, Western Reserve University Cleveland, November 8 1935. This was a dinner meeting and Dr E E Ecker Associate Professor of Immunology of Western Reserve University School of Medicine was the guest speaker.

Dr Ecker delivered a very interesting talk on the relative values of several well-known antiseptics. Considerable new experimental data relating to phenylmercuric nitrate was discussed and charts were presented showing its superiority as a bactericide and fungicide when employed in very high dilution. In cases of tinea and yeast infections of the skin phenylmercuric nitrate in ointment or lotion form was claimed to be highly efficacious. Further research is being done on this drug which Dr Ecker believes will have far reaching influence in changing current professional opinion of some of our widely used antiseptics.

N T CHAMBERLIN, *Secretary*

PHILADELPHIA

The November meeting of the Philadelphia Branch AMERICAN PHARMACEUTICAL ASSOCIATION was held in the Museum of the Philadelphia College of Pharmacy and Science Tuesday night November 12th, E H MacLaughlin presiding.

The minutes of the October meeting were read and approved.

President MacLaughlin read a communication from the Philadelphia Chamber of Commerce suggesting that the Philadelphia Branch make a bid for the 1937 meeting of the A PH A. Ambrose Hunsherger made a motion that the officers of the Branch notify the Committee on Time and Place of the A PH A that the Philadelphia Branch has gone on record as favoring Philadelphia for the 1937 meeting. Motion seconded and carried.

A letter from Dean Little of Rutgers University concerning a drive for new members for the parent body in 1936 was read. Mr Campbell made a motion that Dean Little's proposal of every member get a member in 1936 be given the endorsement of the Philadelphia Branch and that the President appoint a committee of five to help carry out the drive. Motion seconded and so ordered.

Our guest speaker, Secretary E. F. Kelly of the A. P. H. A., was introduced. He spoke on Pharmaceutical Progress. He referred to the progress made in Pharmacy, as a profession, during the past 15 years, giving due credit to the work of local and state pharmacists for their cooperation. He evaluated Pharmacy for its progress in Education, Legislative Control and Recognition of Professional Standing. He spoke of its recognition by the Federal Government and praised the standards set by Pharmacy.

Statistics were given to show that Pharmacy, as a profession, was not overcrowded, rather there seems to be an uneven distribution of schools and pharmacists.

The speaker's address was one of the most interesting heard by the Local Branch and it looks forward to hearing from Dr. Kelly again. A rising vote of thanks was given him.

GEORGE E. BYERS, *Secretary*

NATIONAL PHARMACY WEEK WINDOW DISPLAY CONTEST COMMITTEE

The following have been appointed to serve on the 1935 National Pharmacy Week Window Display Contest Committee:

Charles F. Henke, Jr., *Chairman*, Registrar, Cincinnati College of Pharmacy, Cincinnati, Ohio; O. C. Reifschneider, president, Ohio Valley Druggists' Association, Cincinnati, Ohio; Bernard J. Kotte, Otto E. Kissner, J. Otto Kohl, retail pharmacists of Cincinnati, Ohio.

This committee will select the winner of the 1935 National Pharmacy Week Window Display Contest from the photographs submitted by the secretaries of the various state pharmaceutical organizations. In addition to the winner, who will be awarded the Federal Wholesale Druggists' Association Robert J. Ruth Memorial Trophy, this committee will select the ten next best photographs which will be awarded merit certificates jointly by the AMERICAN PHARMACEUTICAL ASSOCIATION and the National Association of Retail Druggists.

Professor Henke, chairman of the National Pharmacy Week Contest Committee, will report the results of the contest to the chairman of the National Pharmacy Week Executive Committee, who, in turn, will release a bulletin announcing the winners of the 1935 National Pharmacy Week Window Display Contest.

For National Pharmacy Week Executive Committee, see report in this issue, pages 1023-1026.

SECOND EDITION OF PROFESSIONAL PHARMACY

The first edition of "Professional Pharmacy" has been exhausted and the favorable reception has prompted a revision which has been published. This present edition, which constitutes the first revision, has been prepared in a form particularly suitable for pharmacy schools, in anticipation of a larger use of the publication in the class room. Mr. Delgado has devoted time and study to the revision during the past year and as a result the forthcoming publication contains considerable additional matter. An Appendix includes many questions based upon the text that will aid the instructor and be helpful to the students in gaining an understanding of the problems which develop in pharmaceutical practice and the present conditions surrounding it.

An extended service to retail pharmacists has been kept in mind, therefore, in addition to the questionnaire referred to, the author has added a chapter on prescription pricing schedules and the open view prescription department has been discussed. There is included a list of 253 Manufacturers' Pharmaceutical Specialties, a list of 234 Galenicals, occurring five times or more in each 10,000 prescriptions and other lists give further detailed information on other items, their use, containers and unit price. About twenty-five more pages have been added but it has been possible to continue the price of 25 cents per copy. The publication may be obtained from the AMERICAN PHARMACEUTICAL ASSOCIATION.

ASSOCIATION BUSINESS

AD INTERIM BUSINESS OF THE COUNCIL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION 1935-1936

Office of the Secretary, 2215 Constitution Ave Washington, D C

LETTER NO 6

October 22, 1935

To the Members of the Council

32 *Fixing Date when N F VI Will Become Official* It is expected that N F VI will be issued by December 1 1935 and it therefore becomes necessary to set the date when the Sixth Edition will become official and replace the Fifth Edition

The Board of Trustees of the U S P Convention has set June 1, 1936, as the date when the U S P XI will become official, and it is advisable that both books become official on the same date as they will be issued at about the same time

On page 309 of the April 1926, issue of the A P H A JOURNAL, Item 68 and on page 404 of the May 1926, issue, of the JOURNAL, Item 74, a record will be found of the action taken by the Council fixing the date when the N F V became official

(Motion No 6) It is moved by Du Mez that the National Formulary, Sixth Edition, shall be deemed to become official and to supersede and replace the National Formulary, Fifth Edition on June 1, 1936 and that the Mack Printing Company be authorized and directed to print upon the title page of the National Formulary Sixth Edition the words 'Official from June 1, 1936' A vote on this motion is called for at this time If there is objection or any member desires to submit comment, the vote will be considered as tentative

33 *Copy for the Official Coupon for N F VI* The first printing of N F VI will consist of 25 000 copies and it becomes necessary to order this number of official coupons which the ASSOCIATION is required to furnish

Heretofore, it has been customary to indicate each printing as a series and to identify each series by a letter, beginning with A and to number each coupon consecutively beginning with 1 The use of the serial letter has led to some misunderstanding that later series were revisions and each printing can be identified by the numbers

In the case of the coupons for the U S P XI it has been decided to omit the serial letter and to continue numbering the coupons consecutively beginning with 100,001 so that the coupon numbers for U S P XI cannot be confused with those for U S P X, which are below 100 000 It is proposed to carry out the same arrangement for N F VI

The coupon for N F VI will be of the same size as that for N F V and printed in the same colors—black and tan The same background cut will be used with the following wording printed thereon

National Formulary

Sixth Edition

Official Copy

Copyright 1935 by the

AMERICAN PHARMACEUTICAL ASSOCIATION

100,001

(Motion No 7) It is moved by Du Mez that a serial letter be omitted from the official coupons for N F VI, that the coupons be numbered consecutively beginning with 100 001 and that the wording given above be approved for use on the coupons A vote on this motion is called for at this time If there is objection or any member desires to submit comment the vote will be considered as tentative.

34 *Use of the Text of the National Formulary VI* An application for permission to use portions of the text of the National Formulary in the forthcoming revision of General Technique of Medication has been received from Dr Bernard Fantus of Chicago Illinois The request

was referred to Chairman DuMez of the Committee on Publications who submits the following motion

(Motion No 8) It is moved by DuMez that permission to use portions of the text of the National Formulary in the forthcoming revision of "General Technic of Medication" be granted to Dr Bernard Fantus, and that the customary charge of \$5 00 be waived because of the small amount of material quoted and the manner in which it is to be used, with the understanding that the publication will not be issued until the N F VI appears

35 Applicants for Membership The following applications properly endorsed and accompanied by the first year's dues have been received

No 21, Carl F Riley, 7054 Veronica Road, Upper Darby, Penna , No 22, Morris Garfinkle, 2319 Voorhies Ave , Brooklyn, N Y , No 23, Harry H Leiter, 624 Price St , Pismo Beach, Calif , No 24, Amelia Carmel De Dominicis, 2621 E Madison St , Baltimore, Md , No 25, Charles Greenberg, Wittel Dormitory, Auburn, Ala , No 26, Alfred R Biamonte, 403 37th St , Union City, N J , No 27, Joseph S Goldwag, 600 Lafayette Ave , Brooklyn, N Y , No 28, Abraham Louis Schneider, 2943 Thomas St , St Louis, Mo , No 29, Sigrid Maria Van Schaack, 614 Linden Ave , Wilmette, Ill , No 30, Daniel O Wolff, 21 Felton Place Melrose, Mass , No 31, Alexander V Morgenstern 12 John St New York, N Y , No 32, Maybelle Fernolld, 700 Fullerton, Chicago, Ill , No 33, Richard H Herbine, 113 No 13th St , Newark, N J No 34 Cary Melville Turner, 3500 Armstrong, Dallas, Texas, No 35, Jagadish Kumar Lahiri, c/o The American Express Co , Calcutta, India

(Motion No 9) Vote on applications for membership in the American Pharmaceutical Association

E F KELLY, Secretary

LETTER NO 7

October 29, 1935

To the Members of the Council

36 Date When N F VI Will Become Official Motion No 6 (Council Letter No 6, page 1034) has been carried and the N F VI will become official on June 1, 1936 The Mack Printing Company has been authorized and directed to print upon the title page of the N F VI the words "Official from June 1, 1936 "

37 Official Coupon for N F VI Motion No 7 (Council Letter No 6, page 1034) has been carried and the coupons will be prepared in accordance

38 Use of the Test of the N F VI Motion No 8 (Council Letter No 6, page 1035) has been carried and Dr Bernard Fantus has been advised

39 Election of Members Motion No 9 (Council Letter No 6, page 1035) has been carried and applicants for membership numbered 21 to 35, inclusive are declared elected

40 Publication Date for N F VI The Mack Printing Company has advised that the U S P XI and the N F VI will be completed early in December and that they expect to have the books distributed throughout the country so that they can be released for sale on December 16, 1935 The Board of Trustees of the U S P Convention have approved this date as the official date of publication for U S P XI and the Council is requested to take similar action in order that the books will be released on the same date

(Motion No 10) It is moved by DuMez that December 16 1935, be approved as the official date for the publication of the N F VI, and that the Mack Printing Company be so advised and directed

41 Color of Cover and Label for N F VI It was decided some time ago that the buckram for the cover of N F VI should be of the same quality as that used for N F V and should be maroon in color The stock for the first printing of 25,000 copies was ordered at that time The label to be imprinted on the back-bone of the book will be in gold on black similar to that on N F V, and will bear the words "National Formulary—Sixth Edition—1936 "

42 Applicants for Membership The following applications properly endorsed and accompanied by the first year's dues have been received

No 36, Robert Latta Crowe, 874 Union Ave , Memphis, Tenn , No 37, Newell W Tirrell, 33 East St , Warren, Mass , No 38, Wilbur R Borst, 210 Charles Ave , Staten Island, N Y , No 39, James Comstock Tingle, 345 North Broadway, Lexington, Ky , No 40 Lloyd B Edwards,

+27 Central Ave. San Francisco Calif. No. 41 Robert E. Richards R. F. D. 3 Box 453 Lodi Cal. No. 42 Maurice G. Dixon -27 Central Ave. San Francisco Calif. No. 43 John Shepard Puller - Sarville Md.

(Motion No. 11) Vote on copy of new membership for the American Pharmaceutical Association

E. F. Kelly Secretary

LETTER NO. 8

November 19 1935

To the Members of the Council

+3 *Publication of Bulletin No. 10* (Council Letter No. 7 page 1035) has been carried and the Mack Printing Company has been so advised. Attached is copy of Bulletin No. 3 officially announcing the publication date of N. F. VI and the date when it will become official and replace N. F. V.

+4 *Executive Members* Motion No. 11 (Council Letter No. 7 page 1035) has been carried and applications of membership numbered 23 to 25 inclusive are declared elected.

+5 *Flexible Leather Binding for N. F. VI* A real price of \$7.00 per copy for N. F. VI in Flexible Leather Interwoven Binding was set in Council Letter No. 8 1934-1935 page 12-4 dated November 9 1934 and this was confirmed at the meeting of the Executive Committee held in Washington on January 1 1935. Since that time it has become apparent that a Flexible Leather Binding without interweaves will be preferred for N. F. VI as well as for U. S. P. XI.

The Mack Printing Company was requested to furnish a price on this binding and quoted \$3.97 per copy and a return of \$4.02 per copy to the Association if a real selling price of \$6.00 per copy was set. The U. S. P. Board of Trustees have set a real price of \$7.00 per copy for the U. S. P. XI Flexible Leather Binding without interweaves.

(Motion No. 12) It is moved by Dufferin to change the price of the Mack Printing Company of \$0.57 per copy for N. F. VI in Flexible Leather Binding to a return of \$4.32 per copy in the 4th price - accepted and made a price of \$4.32 per copy for the 4th price and the return of \$4.32 per copy for N. F. VI and a real selling price of \$6.00 per copy for N. F. VI in Flexible Leather Binding of \$6.00 per copy. A vote on this motion is called for at this time. It will be considered tentative if there is objection or if members of the Council desire to submit comments.

+6 *Special Committee on Emblem* - See Item No. 1-5 Council Letter No. 22 1934-1935 page 70-4. A. P. H. A. JOURNAL 10 August 1935. In accordance with the action taken Chairman Hill on has appointed George D. Beal Chairman Edward Kremers W. A. Hamer Charles H. LaWall and E. G. Eberle as members of the Special Committee to consider this matter and to report to the Council.

In the mean time a request has been received from Dr. Hamer Assistant Director of the Mellon Institute of Industrial Research to use the emblem of the Association in an appropriate manner in the new building of the Institute with the statement that with the approval of the A. P. H. A. the present emblem carrying the letters A. P. H. A. will be used and that when and if a new emblem replaces it the Institute will have the new device executed in replica and put in the place of the reproduction of the present emblem.

(Motion No. 13) It is moved by Eberle that the Mellon Institute be granted permission to use the present emblem of the Association in the manner explained above with the understanding that the reproduction or use or replaced by that of a new emblem when and if shall be approved. A vote is called for at this time. It will be considered as tentative if there is objection or if members of the Council desire to submit comments.

+7 *Correction in the Minutes of the Council* Dr. Fischel has called attention to two errors in the minutes of the Council as submitted in Council Letter No. 22 1934-1935. The members of the Council are requested to change the term 'Director of Publications' to 'Director of Publications' in paragraph three under Item 123 page 699 A. P. H. A. JOURNAL August 1935 and to change the word 'estimate' to 'entrusted' in recommendation (3) in the report of the Committee on Research Item 136 pages 702-703 of the same issue of the JOURNAL.

+8 *Use of Text of N. F.* The following letter from C. W. McClintock Director Laboratory Supply Stores Ohio State University Columbus Ohio

Our Department contemplates the compilation of a Formulary to be used on our campus here at Ohio State University. In our Formulary we wish to use certain portions of the text of

the National Formulary Will you kindly advise us where we may obtain such permission or else refer our request to the proper authority directly?" It was referred to Chairman DuMez of the Committee on Publications who wrote as follows

"In response to the request of C W McClintock, Director of Laboratory Supply Stores of Ohio State University, it is moved that permission be granted to use portions of the text of the National Formulary for comment or otherwise in the compilation of a formulary to be used on the campus at Ohio State University and that no charge be made therefore

"I offer this motion at this time because I feel that we have so much precedent for granting permission in similar cases that it would be going to unnecessary trouble to refer this to the Publication Committee "

(Motion No 14) It is moved by DuMez that permission be granted to use portions of the text of the National Formulary for comment or otherwise in the compilation of a formulary to be used on the campus of the University of Ohio and that no charge be made therefore, with the understanding that the formulary will not be issued until after the N F VI is released for sale A vote on this motion is called for at this time but will be considered as tentative if there is objection or if members of the Council desire to submit comment

49 *American Association for the Advancement of Science* On August 28th, the A A A S was informed of the adoption by the A P H A of two resolutions relating to that ASSOCIATION as given on pages 712 and 713 of the August 1935, issue of the A P H A JOURNAL The following letter dated October 29th, has been received from Permanent Secretary Henry B Ward

"At a recent meeting of the executive committee of the ASSOCIATION held in this city your letter of August 28th, was laid before the members and entered in the record of the occasion

"I am writing to tell you that the committee appreciates genuinely the action you took in expressing your gratification of the arrangements agreed upon

"On our part I may say that we were indebted to you for the prompt action in appointing delegates to the Seventh Pan American Scientific Congress which was held in Mexico City last September You will be interested to know that because of your prompt action and that of various other affiliated societies a conspicuous part of the American delegation at the Congress in Mexico City consisted of representatives from this ASSOCIATION and its affiliated societies

"With best wishes for the continued and increasing success of your organization and in the confident hope that the relations established may serve as an important element in the advancement of science "

50 *Appointment of Committees and Delegates* President Costello has made the following appointments Committee on Cosmetics, Maison de Navarre Detroit, Mich is added to the membership, Delegates to National Drug Trade Conference James H Beal Robert P Fischelis and E F Kelly are named as delegates to the Conference for 1935-1936

President Costello writes as follows

"It is my belief that the purpose of the Conference can be best served by those who have long been familiar with its practices and functions and that the provision for appointment of three delegates annually should be supplanted by a provision for three-year terms for each delegate, one to be appointed annually

"Since no instructions are given to delegates who participate in the Conference by their respective Associations, I assume each delegate is privileged to exercise its own judgment as to their policy or attitude toward it

"I am convinced that the Drug Trade Conference is a useful institution which has served a useful purpose, and will continue to be so if it is held in regard by the delegates as a Conference and not treated as a super drug organization

"In discharging my responsibility to the AMERICAN PHARMACEUTICAL ASSOCIATION in the appointment of its delegates I do so in the belief that you will effectively serve the Conference without prejudice, and the ASSOCIATION

51 *Applicants for Membership* The following applicants properly endorsed and accompanied by the first year's dues have been received

No 44 Leonard D Powers, 715 S Wood St Chicago, Ill , No 45 H A Sasse, Redfield S Dak , No 46 E E Miller, Davenport Wash , No 47, Edwin Martin Durand 133 W Milton Ave Rahway, N J , No 48 Paul David Carpenter 665 South St Elgin, Ill , No 49, Joseph C Ocenasek, 1121 Washington, Blvd , Oak Park Ill , No 50 Roy E Phillips, 3423 S Flores St San

427 Central Ave , San Francisco, Calif , No 41, Robert E Richards, R F D 3, Box 453, Lodi, Calif , No 42, Maurice G Dixon, 427 Central Ave San Francisco, Calif , No 43, John Shepard Puller, Starkville, Miss

(*Motion No 11*) *Vote on applications for membership in the American Pharmaceutical Association*

E F Kelly, *Secretary*

LETTER NO 8

November 19, 1935

To the Members of the Council

43 *Publication Date for N F VI* Motion No 10 (Council Letter No 7, page 1035) has been carried and the Mack Printing Company has been so advised Attached is copy of Bulletin No 3, officially announcing the publication date of N F VI and the date when it will become official and replace N F V

44 *Election of Members* Motion No 11 (Council Letter No 7, page 1036) has been carried and applicants for membership numbered 36 to 43, inclusive, are declared elected

45 *Flexible Leather Binding for N F VI* A retail price of \$7 00 per copy for N F VI in Flexible Leather Interleaved Binding was set in Council Letter No 8 1934-1935 page 1244, dated November 9 1934 and this was confirmed at the meeting of the Executive Committee held in Washington on January 4 1935 Since that time it has become apparent that a Flexible Leather Binding without interleaves, will be preferred for N F VI as well as for U S P XI

The Mack Printing Company was requested to furnish a price on this binding and quoted \$0 97 per copy and a return of \$4 32 per copy to the ASSOCIATION if a retail selling price of \$6 00 per copy was set The U S P Board of Trustees have set a retail price of \$6 00 per copy for the U S P XI Flexible Leather Binding without interleaves

(*Motion No 12*) *It is moved by DuMeez that the quotation of the Mack Printing Company of \$0 97 per copy for N F VI in Flexible Leather Binding with a return of \$4 32 per copy to the A Ph A be approved and made a part of the contracts for the manufacture and for the distribution and sale of N F VI and that the retail selling price of the N F VI in Flexible Leather Binding be set at \$6 00 per copy* A vote on this motion is called for at this time It will be considered tentative if there is objection or if members of the Council desire to submit comments

46 *Special Committee on Emblem for the Association* Please see Item No 143, Council Letter No 22, 1934-1935 page 704 A Ph A JOURNAL for August 1935 In accordance with the action taken, Chairman Hilton has appointed George D Beal *Chairman* Edward Kremers W A Hamor Charles H LaWall and E G Eberle as members of the Special Committee to consider this matter and to report to the Council

In the mean time, a request has been received from Dr Hamor Assistant Director of the Mellon Institute of Industrial Research, to use the emblem of the ASSOCIATION in an appropriate manner in the new building of the Institute with the statement that with the approval of the A Ph A the present emblem carrying the letters A Ph A will be used and that when and if a new emblem replaces it, the Institute will have the new device executed in replica and put in the place of the reproduction of the present emblem

(*Motion No 13*) *It is moved by Eberle that the Mellon Institute be granted permission to use the present emblem of the Association in the manner explained above with the understanding that the reproduction will be replaced by that of a new emblem when and if it shall be approved* A vote is called for at this time It will be considered as tentative if there is objection or if members of the Council desire to submit comments

47 *Correction in the Minutes of the Council* Dr Fischelis has called attention to two errors in the minutes of the Council as submitted in Council Letter No 22 1934-1935 The members of the Council are requested to change the term "Director of Publicity" to "Director of Publications" in paragraph three under Item 123 page 699, A Ph A JOURNAL, August 1935, and to change the word "estimate" to "entrusted" in recommendation (3) in the report of the Committee on Research, Item 136 pages 702-703 of the same issue of the JOURNAL

48 *Use of Text of N F* The following letter from C W McClintock, Director, Laboratory Supply Stores, Ohio State University, Columbus Ohio

'Our Department contemplates the compilation of a Formulary to be used on our campus here at Ohio State University In our Formulary, we wish to use certain portions of the text of

the National Formulary Will you kindly advise us where we may obtain such permission or else refer our request to the proper authority directly?" It was referred to Chairman DuMez of the Committee on Publications who wrote as follows

"In response to the request of C W McClintock, Director of Laboratory Supply Stores of Ohio State University, it is moved that permission be granted to use portions of the text of the National Formulary for comment or otherwise in the compilation of a formulary to be used on the campus at Ohio State University and that no charge be made therefore

"I offer this motion at this time because I feel that we have so much precedent for granting permission in similar cases that it would be going to unnecessary trouble to refer this to the Publication Committee "

(Motion No 14) It is moved by DuMez that permission be granted to use portions of the text of the National Formulary for comment or otherwise in the compilation of a formulary to be used on the campus of the University of Ohio and that no charge be made therefore, with the understanding that the formulary will not be issued until after the N F VI is released for sale A vote on this motion is called for at this time but will be considered as tentative if there is objection or if members of the Council desire to submit comment

49 *American Association for the Advancement of Science* On August 28th, the A A A S was informed of the adoption by the A P H A of two resolutions relating to that ASSOCIATION as given on pages 712 and 713 of the August 1935 issue, of the A P H A JOURNAL The following letter, dated October 29th, has been received from Permanent Secretary Henry B Ward

"At a recent meeting of the executive committee of the ASSOCIATION held in this city your letter of August 28th was laid before the members and entered in the record of the occasion

"I am writing to tell you that the committee appreciates genuinely the action you took in expressing your gratification of the arrangements agreed upon

"On our part I may say that we were indebted to you for the prompt action in appointing delegates to the Seventh Pan American Scientific Congress which was held in Mexico City last September You will be interested to know that because of your prompt action and that of various other affiliated societies a conspicuous part of the American delegation at the Congress in Mexico City consisted of representatives from this ASSOCIATION and its affiliated societies

"With best wishes for the continued and increasing success of your organization and in the confident hope that the relations established may serve as an important element in the advancement of science "

50 *Appointment of Committees and Delegates* President Costello has made the following appointments Committee on Cosmetics, Maison de Navarre, Detroit Mich is added to the membership, Delegates to National Drug Trade Conference James H Beal, Robert P Fischelis and E F Kelly are named as delegates to the Conference for 1935-1936

President Costello writes as follows

"It is my belief that the purpose of the Conference can be best served by those who have long been familiar with its practices and functions and that the provision for appointment of three delegates annually should be supplanted by a provision for three-year terms for each delegate one to be appointed annually

"Since no instructions are given to delegates who participate in the Conference by their respective Associations, I assume each delegate is privileged to exercise its own judgment as to their policy or attitude toward it

"I am convinced that the Drug Trade Conference is a useful institution which has served a useful purpose, and will continue to be so if it is held in regard by the delegates as a Conference and not treated as a super drug organization

"In discharging my responsibility to the AMERICAN PHARMACEUTICAL ASSOCIATION in the appointment of its delegates I do so in the belief that you will effectively serve the Conference without prejudice, and the ASSOCIATION '

51 *Applicants for Membership* The following applicants properly endorsed and accompanied by the first year's dues have been received

No 44, Leonard D Powers, 715 S Wood St, Chicago Ill, No 45, H A Sasse, Redfield, S Dak, No 46, E E Miller, Davenport, Wash No 47, Edwin Martin Durand 133 W Milton Ave Rahway, N J, No 48, Paul David Carpenter, 665 South St, Elgin, Ill, No 49, Joseph C Ocenasek, 1121 Washington, Blvd, Oak Park Ill, No 50, Roy E Phillips, 3423 S Flores St, San

Antonio, Texas, No 51, J M Anderson, 8 Brown Place, Woburn, Mass, No 52 Albin Stitt 777 Neponset St, Norwood Mass, No 53, Charles Walter White, 56 Queensberry, Boston Mass, No 54, Lawrence S Crosby, 12 Grafton Ave, East Milton, Mass, No 55, John L MacIver, 37 Whittier Rd, Newtonville, Mass, No 56 Joseph Allen Hailer 20 Orchard St, Jamaica Plain, Mass, No 57, Neut Gardner 1700 W 39th St, Kansas City, Mo, No 58 Henry Brenwasser 226 9th Ave, New York, N Y, No 59, Walter A Piepho, 4224 N Winchester Ave, Chicago Ill, No 60, Raymond S Adamson, 715 S Wood St, Chicago, Ill, No 61, Sam Bradshaw, 4800 Charlotte Ave, Nashville, Tenn No 62 William Charles Atkinson, 1041 W 36th St, Los Angeles, Calif, No 63, William M Lange, 57 Dove St Albany N Y, No 64, Winifred Bump, Pullman, Washington, No 65, Janice Sourwine Box 686 C S, Pullman, Washington, No 66 Steve Davidson, Box 717 C S, Pullman Washington No 67 James Chase, 403 Side St, Pullman Wash, No 68, William E Allen, Box 724 C S Pullman Wash, No 69, Vernetta Engebretson, Box 156, C S, Pullman, Wash, No 70, John Foster, 505 Colorado, Pullman Wash, No 71, Harlan Hanson Box 366 C S Pullman Wash No 72 Robert Hill 106 Windus Ave, Pullman, Wash, No 73, Gail Howard, 1725 B St Pullman, Wash, No 74 Thomas Hurley Box 341 C S, Pullman, Wash, No 75, Geraldine Jayne Box 874 C S, Pullman, Wash, No 76 Edward L Jennings 505 Colorado St, Pullman Wash, No 77, Lawrence Klock 505 Colorado Pullman Wash, No 78 Fred Krauel 1605 F St Pullman, Wash, No 79 Robert D Lee, 747 C S, Pullman Wash, No 80 Donald McLeod 812 Linden Pullman, Wash, No 81, Chester Moss, Box 674 C S, Pullman Wash No 82 Harold Pfannekuchen Box 116 C S, Pullman, Wash, No 83, Mark Preston 506 Morton St, Pullman Wash, No 84 Elmer Ray, Box 674 C S, Pullman, Wash, No 85 James Reavis R No 1, Box 12, c/o I Williams Pullman Wash, No 86, John D Scheel Box 366 C S Pullman Wash, No 87 Ray Seaman, 510 Campus, Pullman, Wash No 88 Ted Stahlborn, 910 State St, Pullman, Wash, No 89 Tako Torigoe Box 354 C S, Pullman Wash No 90 Leonard Paul Zagelow Box 686 C S, Pullman, Wash, No 91 Ralph Gerald Ferrace 344 Orange St Newark, N J, No 92 Ralph F Voigt, 3809 Elliot Ave S Minneapolis Minn, No 93, William Janacek 483 Clinton Ave, St Paul, Minn, No 94, Ole Gisvold University of Minnesota Minneapolis Minn, No 95 Wm H Stokes Taylerville Ill, No 96 Arnold C E Christensen 2342 N Kenneth Ave, Chicago, Ill, No 97 Evan N Tysdal, 325 W Huron St Chicago, Ill, No 98, Robert Livingston Longyear 489 E 34th St, Brooklyn, N Y, No 99 George E Millman 216 Mountain Ave, Bound Brook, N J No 100 William O Knight, 11432 Indiana Ave, Chicago Ill, No 101 Daniel Fisher Nealson, P O Box 485, Paris Tenn

(Motion No 15) *Vote on applications for membership in the American Pharmaceutical Association*

52 *Meeting of the Council* It was understood that the meeting of the Council in December would be held just before or just after the annual meeting of the National Drug Trade Conference as several members of the Council are also delegates to the Conference

The annual meeting of the Drug Trade Conference will be held on Friday, December 6th either Thursday the 5th or Saturday the 7th is convenient for President Costello and for those members of the Council living in Washington

The members of the Council are requested by Chairman Hilton to indicate on the enclosed voting card which day is preferred for the Council meeting

E F Kelly, *Secretary*

"ABSORPTION OF DRUGS BY THE HUMAN SKIN"*

Iodine, Potassium Iodide, Methyl Salicylate and Quinine Dihydrochloride were applied in the form of ointment (Petrolatum Benzoinated Lard and Lanolin being used as the bases), and, in the case of Iodine also as tincture and aqueous solution The presence of the drug itself or of derivatives in the urine was accepted as a criterion of absorption The influences of the ointment base, alcohol and water as the solvent age, sex, complexion site of application and nature of the drug itself on the absorption by the skin are disclosed

* Abstract of a paper before Scientific Section, A PH A, Portland meeting, 1935—by A Richard Bliss, Jr

EDITORIAL NOTES

On account of other matter, reports and papers this section has only a few pages. The reports of the Portland meeting will be concluded in the December issue.

The U S Pharmacopœia XI and National Formulary VI will be on sale December 16th, but will not be official until June 1, 1936.

MEETING OF THE COUNCIL A PH A

A meeting of the Council of the AMERICAN PHARMACEUTICAL ASSOCIATION will be held in Washington at the AMERICAN INSTITUTE OF PHARMACY, December 5th, to discuss various matters referred to this meeting at Portland.

JOURNAL EXCHANGES

The JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION will exchange other copies for that of January 1922, and that of September 1914.

CERTIFICATE ISSUED TO CONTRIBUTORS TO CENTURY OF PROGRESS FUND

A certificate of participation has been awarded by the AMERICAN PHARMACEUTICAL ASSOCIATION and the Local Committee, signed by the officers, to those who contributed to the fund and made the Pharmacy Exhibit possible.

CHRISTMAS SEALS

The campaign against tuberculosis is meeting with success. Such is the verdict of physicians and of statisticians whose business it is to study mortality rates. But the battle is not yet won.

Rather, it is indicated that, because of widespread poverty resulting from the depression, some of the gains of recent years may be lost. The white plague always has been a poor man's disease. It has a definite relation to economic stress. When times are hard it prospers. Support by purchasing Christmas Seals affords an opportunity to help the cause.

UNITED STATES CIVIL SERVICE EXAMINATION

The United States Civil Service Commission has announced an open competitive examination as follows:

SENIOR CHEMIST (DISTILLATION)

Applications for the position of senior chemist (distillation) must be on file with the U S

Civil Service Commission, Washington, D C, not later than January 6, 1936. At present there is a vacancy in the Alcohol Tax Unit, Treasury Department, which will be filled as a result of this examination.

The entrance salary is \$4600.00 a year, subject to a deduction of $3\frac{1}{2}$ per cent toward a retirement annuity.

Applicants must have been graduated with a bachelor's degree from a college or university of recognized standing upon the completion of at least 118 semester hours, majoring in chemistry or chemical engineering. In addition, except for the substitution provided below, they must show, as a minimum, experience, *acquired since graduation*, of length and quality indicated below. At least 6 years of responsible progressive professional experience in scientific chemical work of an investigative or process development nature, at least 2 years of which must have been in the practice and theory of distillation technique involving the separation of low-boiling fractions and azeotropic mixtures. Experience in the manufacture and use of 'metallo organic' compounds and in the use of activated carbon or other adsorbents in filtration technique is highly desirable and additional credit will be given for experience of this character.

Full information may be obtained from the Secretary of the United States Civil Service Board of Examiners at the post office or custom-house in any city which has a post-office of the first or the second class, or from the United States Civil Service Commission, Washington, D C.

ABSTRACT OF U S P CHANGES

Additional abstracts of proposed changes in the Eleventh Revision of the U S Pharmacopœia are now available for the following subjects:

Part II—Proximate Assays

Part III—Volatile Oils

Part IV—Extracts, Fluidextracts and Tinctures—Solutions, Spirits and Syrups—Cerates, Ointments and Miscellaneous Galenicals

Part V—Botany and Pharmacognosy

Part VI—Organic Chemicals

Copies of these abstracts may be obtained by addressing the chairman of the Committee of Revision. There is no charge.

PERSONAL AND NEWS ITEMS

Dr R Eder, member of the AMERICAN PHARMACEUTICAL ASSOCIATION and head of the Pharmaceutical Institute Zurich, Switzerland, has made an extended tour of Canada and the United States. He is accompanied by his wife, who also is a scientist and member of a number of Women's organizations in the scientific field.

Dr Eder is making a study of the pharmaceutical institutions and of pharmaceutical and chemical manufacturing plants with a purpose of embodying some of the ideas in the curriculum of the institution of which he is the head. Further comment will be made in the next issue of the JOURNAL. At this writing the visitors are in Washington.

John Uri Lloyd, veteran member and also as former president of the AMERICAN PHARMACEUTICAL ASSOCIATION, has returned from a visit to Japan. He arrived in Japan September 26th, and, as stated, returned safely and in good health from this extended journey.

James H. Breasted, noted Egyptologist who was among those first to enter Tutankhamen's tomb, is reported critically ill. He is a noted author, lecturer, recipient of many degrees honored by universities, organizations here and abroad, and by many countries. He is also a graduate of the Chicago College of Pharmacy before taking up the researches which made him famous throughout the world. He died December 2nd.

Dr J. J. Durrett has been reappointed chief of the drug division of the United States Food and Drug Administration a position which he held for some time until his resignation four years ago.

During the past four years Dr Durrett has been director of professional relations for E. R. Squibb & Sons. He has resigned that post effective January 1st to return to the Government service.

Dr Ole Givold is now a member of the University of Minnesota staff of the Department of Pharmaceutical Chemistry under Dr C. H. Rogers.

Dr Howard B. Lewis, University of Michigan, returned from a month's lecture tour to the Pacific coast and return under the auspices of the Biochemistry Section of the American Chemical Society.

The University of Buffalo is planning for a Golden Jubilee Banquet on April 22, 1936

celebrating the 50th anniversary of the School of Pharmacy. An oil portrait of Dr Willis G. Gregory, who has been a member of the faculty since its founding, will be a gift of the Alumni of the School of Pharmacy.

On October 29th, the Mercer Club, Buffalo, honored him at a luncheon.

Dr Charles Campbell, of Washington, D. C., presented to the AMERICAN INSTITUTE OF PHARMACY two mortars: one a Wedgwood and the other a large porcelain mortar. They were given to Dr Campbell by Mrs. Drane and had been in use for many years by the late Dr. Marcellus MacKenzie of Charlottesville, Va. They date back to about 1846.

Andrew Scherer's 80th birthday was celebrated by the Chicago Veterans' Association on November 21st. The guest of honor has been a member of the AMERICAN PHARMACEUTICAL ASSOCIATION for more than 50 years.

M. R. MacFarland succeeds the late J. F. Roberts as Registrar and Treasurer of Ontario College of Pharmacy.

Malcolm G. Gibbs, founder of People's Drugstores, was feted October 29th by his fellow citizens on the occasion of the 30th anniversary of founding the stores of which he is the head. Normal C. Kral, president of the Advertising Club, presided at the dinner. A letter of congratulations was received from President Roosevelt.

Armour and Company will open a new pharmaceutical manufacturing laboratory at Chicago. In addition, new research laboratory facilities will be established devoted to scientific investigation of organotherapeutic remedies. The new pharmaceutical equipment will be housed in the same building with other Armour laboratory facilities so that research equipment may be fully utilized.

QUAKE INJURIES

The Starz Pharmacy, Helena, Mont., received a severe blow and although the prescription room was not seriously damaged, the front room stocks were thrown on the floor by the swaying of the wall. C. H. Herman, proprietor of the Starz Pharmacy, estimates his damage at between \$400.00 and \$500.00. Sympathy is expressed. Carl Herman and Emil Starz are members of the AMERICAN PHARMACEUTICAL ASSOCIATION.

CHARLES E DOHME MEMORIAL LECTURESHIP

The eleventh course of lectures of the Charles E Dohme Memorial Lectureship was given during November at Henry M Hurd Memorial Hall Baltimore, by Professor James A Gunn, director of the Nuffield Institute of Medical Research, University of Oxford

PHARMACY WEEK

Dean Ernest Little gave a radio address on "The Romance of Pharmacy" on a special Pharmacy Week Program, on coast to coast network of the Columbia Broadcasting System

University of Florida broadcasted addresses by E H Rauch, B L White, E J Ireland, Victor Wray, Max S Adler and C G Hamilton A Pharmacy convocation was part of the week's program Edward S Rose of Boerner's Prescription Pharmacy, Iowa City displayed a Pharmacy Week window based on the Code of Ethics of AMERICAN PHARMACEUTICAL ASSOCIATION—1, The Pharmacist and the Public, 2, The Pharmacist and the Physician, 3, Relation of Pharmacists to Each Other Certificates of membership in Associations, U S Phar-

macopœia National Formulary and eighty preparations of these standards were displayed

The following is quoted from a radio talk — "To day more than a million dollars worth of vaccines and serums have been shipped into Africa from pharmaceutical laboratories of America and Europe, to safeguard soldiers from infection"

The apothecary's art, bound up of old with mystery and superstition, has gone completely modern It has none of the dusty, shabby-genteel aspect of old legends The present trend is to make the prescription department the heart of the store, with ware and apparatus accurate, immaculate and aseptic This same spirit is reflected in other departments, where everything from cosmetics to ice cream sodas may be vended, all under professional supervision To the consumer, this means simply better health protection in a variety of ways Some day the public will demand of all retail stores that they be clean and well equipped, adequately lighted and conveniently arranged for sanitary display of merchandise The pharmacy, which has never lost its influence as a community gathering place, is leading the parade toward modernization"

OBITUARY

JOSEPH F HINDES

Joseph F Hindes, President of Emerson Drug Company, Baltimore, and member of the AMERICAN PHARMACEUTICAL ASSOCIATION, died October 29th, aged 73 years He entered the employ of Emerson Drug Company in 1890, a year after the founding of the latter by Captain Isaac E Emerson Upon the death of the latter, he became president of the Company He was also vice president of the Citro Chemical Works of America and the Maryland Glass Corporation

FREDERICK H FRICKE

Frederick Henry Fricke, St Louis druggist and former pure food and drug commissioner of Missouri, was found dead November 15th in a room at the Auditorium Hotel, 1803 Pine Street He was head of the Fricke Hahn Drug Company and had been in the drug business in St Louis for about thirty-five years He was active in the campaign in St Louis for funds for the Headquarters of the AMERICAN

Mr Fricke was a former president of the Missouri Pharmaceutical Association and active in association matters He is survived by his widow and a daughter, Mrs Ethel Feldhaus

William Livingston Crounse, for twenty years Washington representative of the National Wholesale Druggists' Association until his retirement in 1934 died at his home in Washington, November 21st, aged seventy-four years

Mr Crounse was born in Milwaukee, the son of Lorenzo Livingston Crounse and Mary C Collins Crounse He attended the Washington public schools and was graduated from Harvard University in 1884 He is survived by his widow

J Fred Windolph, for a number of years member of the AMERICAN PHARMACEUTICAL ASSOCIATION, died November 1935, aged 71 years He was a director and former secretary of Norwich Pharmacal Company

Mr Windolph was graduated from the Philadelphia College of Pharmacy in 1885 and until 1899 was active as retail pharmacist in

Dover, Del, and Brooklyn, N Y He was prominent in Masonic circles

C Louis Dohme, one of the founders of Sharp & Dohme died in Boston Since his retirement Mr Dohme has resided in Atlantic Beach, Fla He is survived by his widow and three children

Thomas A Buckland, former city chemist of

St Louis and for a number of years president of St Louis College of Pharmacy, died October 13th, aged 71 years His widow survives the deceased

Dr Edward Starr Judd died November 30th, in Chicago of pneumonia, aged 57 years He was chief of the Mayo surgical staff Dr Judd held that society would be helped if the people were educated along medical lines

SOCIETIES AND COLLEGES

DRUG TRADE CONFERENCE TO MEET DECEMBER 6TH

The National Drug Trade Conference will hold its annual meeting here December 6th in the Washington Hotel In addition to the regular committee reports the conference will discuss the pending Federal food and drug bill proposals to continue the NRA idea State fair trade laws and other legislative proposals — *Oil Paint and Drug Reporter*

ASSOCIATION OF OFFICIAL AGRICULTURAL CHEMISTS

The Association of Official Agricultural Chemists held its fifty first annual meeting in Washington during the week of November 11th The Wiley memorial address was delivered by Dr W H MacIntire of the University of Tennessee

About twenty five methods were dropped from the A O A C book because the methods appear in the forthcoming U S P or N F The following officers were elected

President, H H Hanson State Board of Agriculture, Dover, Del, *Vice President*, C C McDonnell, Washington, *Secretary Treasurer*, W W Skinner U S Bureau of Chemistry and Soils, Washington, additional members of the *Executive Committee*, H R Kraybill La Fayette, Ind, W S Frisbie Washington, C L Hare, Auburn, Ala, and the retiring president, F E Blanck Washington

IDAHO PHARMACEUTICAL ASSOCIATION

Idaho State Pharmaceutical Association issues *bulletins* and a suggestion from that of No 15 is that they are sending information to pharmacists of the state of important publicity In this way the druggists of Idaho are kept in touch with important legislation and other matters

Another activity is the issuance of prizes to young men for competitive papers The prize winner announced in the bulletin for November 15th, presented the subject, What Is Wrong with the Drug Business?

DISTRICT OF COLUMBIA PHARMACEUTICAL ASSOCIATION

The District of Columbia Pharmaceutical Association will meet at Raleigh Hotel December 10th A report will be made on legislative matter among the subjects will be the consideration of minimum equipment, barbituric acid regulations a uniform narcotic law

The pharmacists of the District of Columbia have taken active part in accident prevention Frequently pharmacists are called upon to render first aid to persons injured in automobile accidents and gain first hand information relative to accidents

OFFICERS ARIZONA PHARMACEUTICAL ASSOCIATION

Arizona Pharmaceutical Association at the annual meeting held in Tucson elected the following officers

President Fred W Moore Flagstaff, *First Vice President*, Andrew Martin Tucson, *Second Vice President* N W Stewart Phoenix *Treasurer*, A M Burch, Phoenix, *Executive Committee* L R Johnson Tucson J B McDonald Jerome, J B Ryan, Globe, H W Vestal Somerton, W C Denson, Mesa, *Executive Secretary* Lawrence Evans

A NEW APPROACH TO LEGALIZED FAIR TRADE

Drug Topics is asked by Dr Robert L Swain, chairman of the N A R D Committee on National and State Fair Trade Legislation, to emphasize that the proposed National Fair Trade Enabling Act," published in *Drug Topics*

for October 28th, while "correct as to principle is only tentative as to phrasing" Between now and January when Senator Tydings of Maryland will present the proposal on the opening day of Congress, the measure is to be subjected to intensive study and this may lead to slight changes in phraseology

CODE FUNDS GO TO PHARMACY BOARD

Retail druggists in the First Congressional district of Oregon, recently voted to give the funds, still in the hands of the Code Authority of that district, to the Oregon Board of Pharmacy, to assist in enforcement of the pharmacy laws The amount is approximately \$200 00 A ruling by the attorney-general authorizes the board to accept such funds Stanley Stevenson, of Eugene, was chairman of the Code Authority for that district

PROTECT RIGHT TO EXIST

Senator Millard Tydings in his address before the N A R D , in Cincinnati, said

The problems of the retail druggist, are first, the general problems of the country, and second, his individual problem Naturally the druggist cannot prosper unless the whole country prospers, and, therefore, while naturally we think first of our immediate business we should not lose sight of the larger aspect of the matter for it is the paramount foundation upon which trade revival and business recovery must be built More intimately, however, the retail druggist is facing a desperate battle as he sees loss leader selling activities threatening more and more his very existence By sensibly and soundly marshalling your forces, measures can be enacted which will at least minimize the dangers from this source and I know you shall evolve the solution and eventually by your seasoned effort accomplish the results desired However, let me close with an appeal to you as citizens of this great nation to more and more lift your eyes beyond the problems of your immediate business to that of the country as a whole, for from the country as a whole come your customers who cannot buy unless they are employed, who cannot be employed unless there is a demand for their goods, and so, therefore, even with your own business problem solved, your business cannot go ahead except the country goes ahead "

ANNUAL REPORT ON DRUG CONTROL WORK

Dr W G Campbell, Chief of the Food and

Drug Administration, has rendered the annual report of the Food and Drug Administration, of the fiscal year ending June 30, 1935 He states that the ether supply is much better and ampuls make a greater showing, out of ninety-six samples submitted for biological assay of imported crude drugs, six were held out of 431 samples of domestic drug preparations, thirty-two required action

GORGAS MEMORIAL INSTITUTE

Rear Admiral Cary T Grayson was reelected chairman of the Gorgas Memorial Institute of Tropical and Preventive Medicine at the annual election, November 13th Other officers were also reelected

Report was made on certain experiments started about six years ago on the control of malaria in Panama The experiments include treatment with medicinal substances

INTERNATIONAL SERUM CENTER IS ESTABLISHED

The Royal Danish Serum Institute at Copenhagen will become a sort of international clearing house for serums used in treating or preventing disease, as a result of action taken by the Eleventh Congress of Biological Standardization held in connection with the League of Nations Hygiene Congress

The Danish Institute has been appointed the international center for preparation and standardization of serum for such diseases as dysentery, lockjaw, diphtheria, pneumonia and wound fever London will similarly become the international center for vitamins, insulin and the sex hormones

International standards for the preparation and composition of twenty-five of the medications to be distributed from Copenhagen and London have been agreed on by the Congress
—*Science News Letter*

TRAFFIC IN OPIUM AND OTHER NARCOTICS

The U S Treasury Department has issued the annual report, ending December 1934, on traffic in opium and other dangerous drugs It is pleasing to note that the percentage of violations by druggists is comparatively small The greater number of violations by far are those by illegitimate dealers and distributors Care is evidenced by legitimate dealers in all activities

W Bruce Philip, in his *bulletin* of October 28th, admonishes druggists that Fair Trade

legislation faces a critical period and all associations and druggists should contribute efforts to bring this new legislation into Congress. It will be helpful if the individual in discussing such legislation will get the viewpoint of the Congressmen, so that if there are points which should be corrected discussion by those who are studying the legislation can meet the objections.

HISTORY REPEATS IN AMERICAN MEDICAL EDUCATION

The *Journal of the A M A*, for September 21st, comments that the factors which brought about unsatisfactory conditions are again at work, as a result of dependence on tuition fees. The tendency has been receiving attention of the Council and it is suggested that educators, state boards of examination physicians and public authorities may well also give it their consideration. Statistics given in the comment are quoted in part:

"Thirty years ago there were in the United States 160 medical schools with an enrollment of 26,147. Ten years later as a result of the investigation of the Council on Medical Education and of the publicity afforded by the Carnegie Foundation for the Advancement of Teaching, the number of schools had been reduced to ninety six and the enrollment to 14,891. Shortly after 1918 when the war ended, there was manifested a tendency to increase, in 1925 the number of students was 18,200. During the academic year just closed it was 22,888. We have returned nearly to

the place where we were when the Council was created. True, the number of schools has not increased with the growing enrollments of recent years."

THE NATIONAL FORMULARY, SIXTH EDITION

The AMERICAN PHARMACEUTICAL ASSOCIATION announces that its Council has officially approved December 16, 1935 as the date when the new N F VI will be released for sale in all parts of the country, and has also approved June 1, 1936 as the date when the N F VI will become official and will supersede the N F V.

As previously announced, the N F VI will be distributed for the ASSOCIATION by the Mack Printing Company of Easton, Penna.

The new National Formulary represents a complete and thorough revision of N F V. Admissions and deletions are based on information obtained in the U S P N F Prescription Ingredient Survey. This survey was made to determine the materials prescribed and the extent of their use throughout the country. The N F VI therefore supplements the scope of the Pharmacopœia and supplies additional information on simples, formulas, diagnostic reagents and standards required by the pharmacist in the practice of his profession.

Of the 689 monographs in the N F VI, 208 are Drug or Chemical Monographs and 481 are Monographs of Pharmaceutical Preparations. The more important additions have been in the monographs for ampuls, tablets, fluid extracts, syrups, tinctures and ointments.

LEGAL AND LEGISLATIVE

OHIO STATE UNIFORM NARCOTIC DRUG ACT

Secretary M. N. Ford of the Ohio Board of Pharmacy is sending out information on the new State Uniform Narcotic Drug Act which became effective September 6, 1935. In most respects, the compliance with the Federal Narcotic Act, will meet the requirements of the new State Act.

The Board has ruled that only those who desire to cultivate or grow Opium, Coca Leaves, Cannabis or other narcotic drugs, need to register and obtain a license as required under Section 12672-2. No license will be granted any applicant until and after an investigation has been made and the application approved.

The Board also ruled that Article 7 under Section 12672-16 does not prohibit the sale of Hypodermic Syringes or Hypodermic Needles.

Section 12672-8, Article 5 provides that manufacturers and wholesalers of Cannabis Indica or Cannabis Sativa shall be required to render with every sale of Cannabis Indica or Cannabis Sativa an invoice, whether such sale be for cash or credit, and such invoice shall contain the date of such sale, the name and address of the purchaser and the amount so sold. Every purchaser of Cannabis Indica or Cannabis Sativa, from a wholesaler or manufacturer shall be required to keep the invoice rendered with such purchase, for a period of two years.

Section 12672-5, Article 1, provides in part

that the pharmacist filling a narcotic prescription, shall write the date of filling and his own signature on the face of the prescription and the prescription shall be retained on file by the proprietor of the pharmacy in which it was filled for a period of two years. The prescription shall not be refilled.

Section 12672-7, Article 1, provides that no one except a pharmacist may sell exempt narcotic drugs and preparations. A complete record of all such sales must be maintained.

The penalty for violating the new Uniform Narcotic Drug Act is, for the first offense a fine of not exceeding five hundred dollars, (\$500 00), or imprisonment for not exceeding five years, or by both such fine and imprisonment, and for a subsequent offense, a fine of not exceeding one thousand dollars (\$1000 00) or imprisonment for not exceeding five years, or both such fine and imprisonment.

The law also provides for the revocation of the certificate of a pharmacist who is convicted of violation of this Act.

Section 12672-18 provides the Act shall be enforced by the State Board of Pharmacy and by all officers within the state. This is to be construed as applying to Federal State, County and Municipal officers.

ALL BRANCHES OF DRUG TRADE EVOLVE MARYLAND CONTRACTS

As result of a month of conferences among retail and wholesale druggists and drug manufacturers the fair trade committee of the Maryland Pharmaceutical Association, of which Simon Solomon is chairman, has succeeded in working out the form of contracts which the three divisions of the industry will be asked to sign. Printed copies of the contracts are going to retailers immediately.

Two copies of each contract will be sent to every retailer, and he will be requested to record on an attached slip his wholesale affiliations. The fact that he names one particular wholesaler, however, will not prevent him from dealing with any other wholesalers in the city.

CONTRACTS TO BE KEPT ON FILE

The retailer will be requested to send the copy of his wholesaler for his signature. The wholesaler, after stating his minimum prices will keep one copy and return the other to the retailer, who is to send it to the committee which will keep it on file as a record.

The idea in Maryland is to leave the operation of the plan entirely in the hands of the re-

tailers themselves, instead of giving the wholesaler the opportunity to control it. The committee plans a record of the fair trade stand of each firm in the trade.—*Drug Topics*, November 25 1935.

NEW YORK FAIR TRADE ACT HELD UNCONSTITUTIONAL

The New York Fair Trade Act was held unconstitutional in a decision handed down by Justice Frederick P. Close of the State Supreme Court, in White Plains, N. Y. Plaintiff was Doubleday, Doran & Co., book publishers, who sued R. H. Macy & Co. The same law was upheld in a prior ruling by Justice Philip A. Brennan, of Supreme Court in Kings County, in the case of Cooper & Cooper *versus* Angert.

Doubleday, Doran & Co., claimed they had made contracts with its retail subsidiary, Doubleday, Doran Bookshops, Inc., setting the retail price of certain books and that Macy was selling their books below the established minimum. Attorneys for both litigants agreed to the facts of the case so that it might be decided strictly on its constitutionality. Following the decision, Doubleday, Doran said appeal would be taken.

Justice Close held that although a law perhaps could be devised which would bring about resale price maintenance, 'the defects in this act are so seemingly patent that it must be declared invalid.' He said, 'Many writers on economic questions have long urged that legislative relief be granted against so-called price-cutting, maintaining that it is an economic evil that should be eradicated. That may be so but my present opinion is that our fundamental law must be changed before such an act as this can be upheld.' He added that if our organic law is to be held elastic enough to permit this type of act, it should be announced by the "court of last resort."

"The Administration has addressed itself to over-production, but not to the displacement of labor by machinery. It has endeavored to promote general business recovery through the N. I. R. A. Now that the Administration is asking for facts showing what happened before, during and since the operation of the National Industrial Recovery Act, it behooves industry to furnish them before December, or not expect any relief from Congress. This not only applies to the law that will supersede the N. I. R. A., if any, but to the passage of the Patman bill prohibiting discrimination in prices to purchasers and any bill amending the Sherman

Act so as to permit the making of contracts under state price maintenance laws by those engaged in interstate commerce"—*Brokmeyer Bulletin*

Clip sheet of November 10th, issued by the Press Service of the U S Department of Agriculture, indicates that ginger ale and some other beverages contain caffeine without making such a statement. The statement is further made that adding caffeine to ginger ale and soft drinks of that type changes their identity and tends to make them stimulating. These beverages are widely consumed by children and persons who are ill. A further comment is that the consumer is entitled to know when ginger ale, root beer and other beverages which ordinarily do not contain caffeine have been changed in this way. Recently a manufacturer of ginger ale was fined \$50.00 for failure to label his product as a caffeine containing drink.

METHOD FOR REVEALING MINUTE AMOUNTS OF LEAD ON FRUIT, IN FOODSTUFFS, AIR AND WATER

Analyzing fruit, foodstuffs and liquids to determine how much lead they contain is not easy—especially if the material to be analyzed is unusually small and the lead in it weighs only a few thousandths of a milligram. Yet such measurements may reveal to scientists a clearer understanding of the composition of organic and inorganic materials, promote better industrial hygiene, and be of great aid to the food industry. Development of an improved colorimetric method for determining minute quantities of lead was reported November 11th at the annual meeting of the Association of Official Agricultural Chemists at Washington, D C. It was developed by chemists of the Food and

Drug Administration, U S Department of Agriculture

THYROID AND HYPERINSULINISM

Strides made by medical science in treating thyroid deficiency and performing goiter operations were explained to the assembly of the Inter State Postgraduate Medical Association of North America, October 17th in Detroit, by Dr Charles H Mayo of Rochester, Minn, retiring president of the organization.

Treatment of hyperinsulinism was described by Dr E Starr Judd and Dr Edward H Ryncarson, both of Rochester, Minn. Dr Ryncarson said he opposed surgery in such cases unless it was definitely established that the patient could not be cured by medical treatment.

LEPERS CURED

Dr William Danner, general secretary of the American Leper Mission, revealed that of the 750 lepers admitted to the hospital since 1921 a total of 171 have been paroled as "symptoms free." He estimated that there were more than 1000 lepers in this country.

The remarkable advance in the treatment and cure of leprosy was discussed by Raymond P Currier, a director of the American Mission to Lepers at St Michael's Protestant Episcopal Church, Amsterdam Avenue and Ninety Ninth Street, New York City.

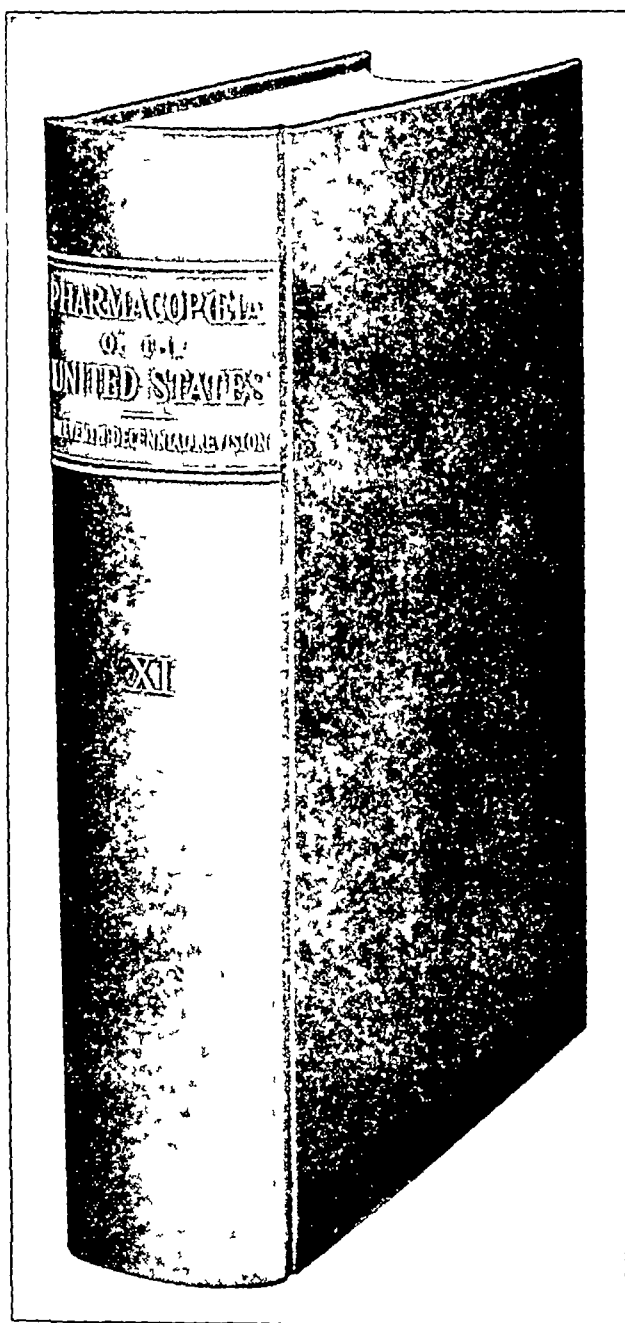
PHARMACY IN SHANGHAI

Figures recently published in Shanghai show that in the Shanghai Pharmaceutical Associations there are only twenty two members who are qualified pharmacists but that there are hundreds of shops selling drugs. In the French Concession there are 145 drug shops and only five of these are run by qualified men.

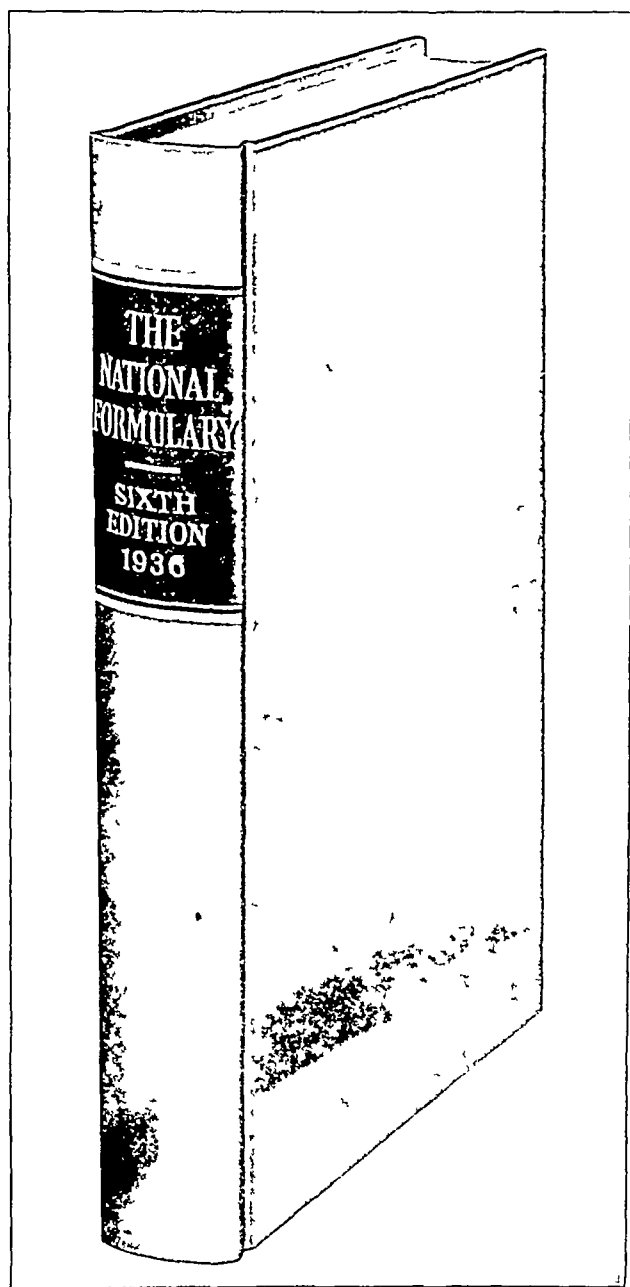
ADDITIONS TO THE HALL OF FAME

William Penn, Simon Newcomb and Grover Cleveland were elected to the Hall of Fame in the 8th quinquennial election. The opportunity comes very infrequently and only to a few of this great honor. Elections are held every five years and the opportunity to place some one in nomination who is worthy will not come again until 1940. The fact that the 11th edition of the Pharmacopœia will soon be completed brings to mind the valuable services rendered by Dr Lyman Spalding. The service which the Pharmacopœia renders is outstanding and preparations should be made to have the founder recognized in the Hall of Fame. While there is absolutely no criticism relative to the high standing of the nominees it is to be noted that President Cleveland is the only one of the three elected who was born in the United States.

Dr Lyman Spalding has a long American lineage, a splendid record as an educator and scientist and rendered a service whereby every one benefits. Steps should be taken to pay honor and tribute to the founder of the UNITED STATES PHARMACOPŒIA in the next election to the Hall of Fame.



The New U S Pharmacopœia



The New National Formulary

JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

VOL XXIV

DECEMBER, 1935

No 12

THE UNITED STATES PHARMACOPŒIA

' In January 1817 Dr Lyman Spalding, of New York City, submitted to the Medical Society of the County of New York, a project for the formation of a National Pharmacopœia "— See JOURNAL A PH A for August 1917 page 617

The General Convention for copœia assembled in the Capitol at elected Samuel Mitchell, M D , *Pres* Secretary "

Two Pharmacopœias were sub-work, which, after full revision, was and ordered to be published by a com-which Dr Lyman Spalding was elected ton, December 15, 1820 The plan of the present edition is the Eleventh De-History of the United States Pharma-copœia



LYMAN SPALDING
1775-1821

the formation of a National Pharma-Washington, January 1, 1920, and dent, and Thomas T Hewson, M D ,

mitted and consolidated into one adopted by the General Convention mittee appointed for that purpose, of *Chairman* It was published in Bos decennial revision has been followed— cennial Revision —See Chapter on the copœia published in the U S Pharma

THE NATIONAL FORMULARY

Early in its history the AMERICAN PHARMACEUTICAL ASSOCIATION gave attention to the problem of preparing a standard formulary Prior to the publication of the National Formulary, Prof J U Lloyd compiled and published a book of *Elivirs* " He granted permission to the



CHARLES RICE
1841-1901

committee in charge of the New York and Brooklyn Formulary to use any formulas in his book as the basis for a National Formulary The *Chairman* of the Committee on National Formulary of the AMERICAN PHARMACEUTICAL ASSOCIATION was Charles Rice¹ and C Lewis Diehl² was named *Chairman* of the Committee of Revision —See Historical Introduction of the National Formulary The Sixth Edition of the National Formulary is now completed under the direction of Chairman E N Gathercoal



C LEWIS DIEHL
(about 1886)
1840-1917

¹ April (1931) JOUR A PH A , page 364 ² September (1925) JOUR A PH A , page 765

EDITORIAL

E G EBLRLE, EDITOR

2215 Constitution Ave WASHINGTON, D C

THE NEW PHARMACOPŒIA

THE Eleventh Revision of the United States Pharmacopœia was released for national distribution on December 16, 1935, and will become official on June 1, 1936. It is approximately ten years since the U S P X, which it supersedes, was similarly released (August 15, 1925) and about one hundred and fifteen years since the First Edition of the United States Pharmacopœia was presented to the medical and pharmaceutical professions by Dr Lyman Spalding. It is proper that we should pause at this time to honor Dr Spalding. He was a pioneer in the profession he represented, being among the first in this Country to advocate the use of smallpox vaccine. He was an unselfish, wise and skilful leader of men, his vision was nation-wide and his culture and professional skill were reflected in the United States Pharmacopœia of 1820.

It is remarkable that the underlying principles which he developed and incorporated in the Pharmacopœia of 1820 are to-day the fundamental policies of the Pharmacopœia of 1936 and only in the degree to which they have been realized is the new Revision to merit approval.

On the first page of the Preface of the U S P 1820, Dr Spalding wrote "It is the object of a Pharmacopœia to select from among substances which possess medicinal power, those, the utility of which is most fully established and best understood."

In the next paragraph he wrote "The value of a Pharmacopœia depends upon the fidelity with which it conforms to the best state of medical knowledge of the day."

It has been the earnest purpose of the sub-committees of the U S P XI to accomplish exactly this objective, that the Pharmacopœia of to day might recognize, standardize and provide official titles for the important and approved medicines of 1936. In addition, the National Formulary has been developed to provide formulas and standards for many important preparations. These should reach every therapeutic need of the modern physician.

In one of the letters issued by Dr Spalding to his colleagues in 1818, urging their participation in the development of a National Pharmacopœia, his appeal was for "Gentlemen willing to act, and men distinguished for their ability and learning." This phrase of his is destined to become classic and is the basic factor if so gigantic a task is to be accomplished with honor and credit.

A review of the long list of those distinguished men of the professions of medicine and pharmacy and of the underlying sciences supporting these professions, will evidence the fact that in the past and also in our generation this standard of excellence has been maintained by those who have carried the burden of Pharmacopœial revision.

The members of both professions believe in these standards for the Pharmacopœia, which are our rich inheritances from the past, and are determined that they shall be maintained in the future.

There are to-day many splendid pharmacists and scientific workers in this field who are conducting researches and contributing their support to the per-

fection of official medicines that the quality of the book may be improved. Their names and activities are being carefully compiled for those who are interested in the future revisions of the Pharmacopœia.—E. FULLERTON COOK

THE NEW NATIONAL FORMULARY

THE National Formulary, Sixth Edition, was released for National distribution on December 16, 1935, and will become official June 1, 1936. It marks a distinct advance in this country in standardization of medicinal agents and in the contributions of pharmacy to public health.

Fifty years ago, at the Pittsburgh meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION, Charles Rice, as chairman of a committee, presented a proposition for a "National Formulary of Unofficial Preparations" under the auspices of the AMERICAN PHARMACEUTICAL ASSOCIATION. The first edition was published in 1888 under the foregoing title, the second edition was published in 1896, under the chairmanship of C. Lewis Diehl, who continued as chairman of the two succeeding revisions, and the Fifth Edition was published in 1926 under the chairmanship of W. L. Scoville. The history of the National Formulary is included in the text of N. F. VI, together with the "General Principles" followed in the latter edition, Edmund N. Gathercoal, chairman.

The following quotations are from pages 492-499 of the Sixth Edition and indicate the broad scope of revision. "The Chairman of the Committee of Revision of the United States Pharmacopœia was made an associate member of the N. F. Revision Committee. The National Dental Association appointed a special associate committee of its members for the consideration of dental formulas, and an associate committee was appointed by the American Veterinary Medical Association for the consideration of veterinary formulas. Thus were established direct contacts with these associations. An associate committee was also appointed by the American Pediatric Society." Officials of the Food and Drug Administration, U. S. Department of Agriculture and several State food and drugs departments gave valuable suggestions and advice.

The outstanding features of the Sixth Edition are summarized.

1. The admission of monographs for drugs and chemicals which are not included in U. S. P. XI or in the N. F. VI.

2. The admission of items on the basis of a definite extent of use in medical practice in the United States.

Four surveys were undertaken. In a survey of 1930, carefully prepared checklists on the extent of use of preparations of N. F. V were returned by 213 prescription pharmacies, 75 hospital pharmacies and 625 drug stores, representing nearly every state in the Union. A similar survey determined the use of a large list of unofficial preparations and a Maryland survey accounted for the number of prescriptions filled annually, showing two prescriptions per inhabitant.

The "Prescription Ingredient Survey" is based on a total of 121,924 prescriptions, the ingredients of which were listed and read by expert pharmacists in New York, Maryland, Missouri and California. On this extensive study it was decided that items to be admitted to the National Formulary must be used in at least 20 per cent of the drug stores in the United States or must be an ingredient in at least

one of each 10,000 prescriptions compounded in the United States. It is thus evident that the recognition of N F materia medica is based on the needs of the physicians.

3 Formulas were omitted from many monographs of simple preparations, such as extracts, fluidextracts, ampuls, tablets, etc. Ample directions in detail are included to guide in the manufacture of larger or smaller quantities of the preparation.

4 Extensive developments of ampul and tablet monographs and the section of materials and preparations for diagnostic use are of interest. The Combined Contact Committee of the American Drug Manufacturers' Association and the American Pharmaceutical Manufacturers' Association has rendered helpful services in the ampul and tablet monographs, the tolerance statements and assay processes.

5 A forward step is evidenced by the admission of glandular powders and histological description of them, for their excellence, credit is given to the subcommittee and particularly to Dr H W Youngken for the histological descriptions, which insure adequate means for the determination of their identity and purity.

6 Attention is called to the development and use of many additional assays of the chemical, proximate and biological types. The monographs are arranged alphabetically.

National Formulary VI contains 481 preparations' monographs, and 208 monographs on drugs and chemicals, 232 are new to this edition, 84 are items from U S - P X, the total number of monographs not admitted from N F V is 321—of these 246 are monographs of preparations and 75 are monographs of drugs and chemicals.

The last paragraph of the "History of the National Formulary" is quoted in full in closing the brief résumé of the new National Formulary, in which pharmacists may have pride, the medical professions will recognize the work as an essential contribution to their practice, and the Federal and State departments concerned with public health matters, food, drug and narcotic regulations, will value it as a necessary and very helpful service.

"During this period (1888-1935) fluidglycerates, glycerogelatin, mulls, and wines have had their day and have been replaced. Formulas for preparations have steadily decreased in the Pharmacopœia, and a diminishing demand is indicated in the National Formulary. Biological products have replaced some of the old drugs and remedies. The National Formulary now functions under very different conditions and purposes from those which it faced in its beginning."

The chairmen and members of the committees have rendered distinctive services, representing achievement and accomplishment.

ADDICTION LIABILITY OF CODEINE

Seven men addicted to morphine were stabilized on four daily hypodermic injections of 0.05 to 0.15 Gm. of morphine sulphate over a period of from ten to thirty days. This stability was maintained when codeine was substituted gradually over three days and entirely over the subsequent eight to fourteen days. The average effective substitution dose of codeine was five times that of morphine.

After the period of stabilization of codeine the administration was abruptly and completely stopped. The effects of abstinence differed only in the delay of their onset from the results of abrupt morphine deprivation. The subjects were aware of the substitution and asked for the substituted product after its withdrawal. The author concludes that codeine possesses definite addiction liability.—C K HEMMELSBACH (*J A M A* 103, 1420).

SCIENTIFIC SECTION

BOARD OF REVIEW OF PAPERS—*Chairman*, F E Bibbins, Glenn L Jenkins, John C Krantz, Jr ,
Heber W Youngken, L W Rowe, L W Rising, C O Lee, E V Lynn, W G Crockett,
Frederick V Lofgren

OBSERVATIONS ON THE OPIUM ASSAY *

BY JOSEPH ROSIN AND C J WILLIAMS ¹

Opium is assayed in most of the Pharmacopœias by either the Helfenberger or by the Lime method. Among the Pharmacopœias using the Helfenberger method or some modification of it are the Austrian, Belgium and German. The British, French (Codex), The Netherlands, Danish and Swiss use the Lime method. The United States Pharmacopœia also uses the Lime assay method with some modification. The Lime assay seems to be the more favored. Some of the Pharmacopœias recently revised have changed from the Helfenberger to the Lime assay method.

Helfenberger Method—A weighed quantity of the opium is triturated with water, then made up to a definite weight with water, and after standing for 30 minutes and mixing, it is filtered. To an aliquot portion of the filtrate, generally corresponding to about two thirds of the original opium 1 or 2 cc of normal ammonia water is added with gentle mixing and the mixture filtered immediately. This treatment with ammonia precipitates the other alkaloids such as narcotine, papaverine, etc. To an aliquot portion of the second filtrate 2 or 2.5 cc of normal ammonia water is again added and shaken for 10 minutes, which precipitates the morphine. It is then shaken with ether or ethyl acetate, filtered, washed and the morphine weighed or titrated.

Lime Method—A weighed quantity of the opium is triturated with water and slaked lime, then made up to definite weight or volume with water mixed well and filtered. To an aliquot portion of the filtrate, generally corresponding to one half or two-thirds of the original opium taken, ether and a small quantity of alcohol are added, followed by 1 or 2 Gm of ammonium chloride, the addition of the ammonium chloride causing the liberation of the morphine from its combination with lime. After mixing, the mixture is allowed to stand over night. It is then filtered, washed and the morphine titrated.

The United States Pharmacopœia assay of opium differs from the other Lime assay methods in that the opium is first completely extracted with water, thus eliminating the use of an aliquot portion with the attendant uncertainties that may be occasioned by the variation in the proportions of water and insoluble matter in the opium.

Criticisms of an opposite character have been frequently leveled against the Lime method. On the one hand it is maintained by some investigators that it yields too high results, claiming that the precipitated morphine is contaminated with co-precipitated titratable lime compounds, others assert that the results obtained by the Lime assay are too low because no account is taken of the morphine lost in the assay process due to solubility of the morphine in the solvents used in the assay. The latter criticism of the Lime method appears to have been the more prevalent, and has been met by some of the Pharmacopœias using the Lime method by applying a "correction" frequently designated as "solubility correction." The

* Scientific Section, A. Ph. A., Portland meeting 1935

¹ Merck & Co., Inc., Rahway, N. J.

correction ranges from 1 to 1.1 mg for each cc of lime-morphine solution used in the assay, and amounts to from 1 to 1.1% on the Opium, or to about 8% of the morphine present in the average opium. A comparison of results obtained in the assay of opium with the British Pharmacopœia—a lime assay applying a correction, with the United States Pharmacopœia assay—a lime assay but without a correction and with the German Pharmacopœia assay which typifies the Helfenberger method, is illustrated in the following tabulation.

TABLE I—ASSAY OF OPIUM BY B. P., U. S. P. AND Ph. G. VI METHODS

	B. P. % Anhydrous Morphine	U. S. P. % Anhydrous Morphine	Ph. G. VI % Anhydrous Morphine
Opium (partially dried)	16.38	15.55 15.61 15.58 Av.	15.08 15.22 15.15 Av.
Opium	13.76	13.09 12.90 13.00 Av.	12.12 12.29 12.21 Av.
Opium powder	10.71	9.77 9.91 9.84 Av.	9.08 8.91 9.00 Av.
Opium granular	10.39	9.73	8.94
Opium		15.24	14.75

The Helfenberger method it will be noted, gives the lowest indications, also, the differences between this method and the other two methods is greatest with the lower testing opiums. This is probably due to the fact that with the lower testing opiums there is a larger excess of ammonia present in the first treatment with ammonia for the removal of the other alkaloids and, therefore, more morphine is precipitated at this stage than with the higher testing opium.

The difference between the United States Pharmacopœia and the British Pharmacopœia assay results is approximately 0.75%. It should, however, be noted that within the last couple years the assays of a number of lots of opium by the British Pharmacopœia method gave results only about 0.2% above the United States Pharmacopœia.

There is no question but that some morphine is held in solution by the solvents in the assay, but the basis for the magnitude of the correction was somewhat obscure, at least to us. It is very much larger than could be accounted for by the solubility of morphine in the solvents. An endeavor to find the basis for the magnitude of the correction and to account for it resulted in the work recorded below.

EXPERIMENTS WITH MORPHINE

The morphine used for the experiments was recrystallized twice from hot methanol and was in the form of well-defined, relatively large crystals. By titration it showed a purity of 99.93% as hydrated morphine. It was also free from non-phenolic alkaloids. The same morphine was used for all the subsequent experiments.

U. S. P. Assay—1.050 Gm. of the morphine was dissolved in water and a slight excess of normal hydrochloric acid the solution made up with water to 30 cc. and then assayed according

to the U S P In a few of the tests the morphine was dissolved in meconic acid instead of hydrochloric acid

B P Assay—1.200 Gm of the morphine was dissolved in water and a slight excess of normal hydrochloric acid, treated with lime and made up to 90 Gm, 52 cc of the filtered solution was then assayed according to directions of the B P

The results are shown in Table II

In all the subsequent experiments with the U S P or B P assay, the quantities of morphine just indicated were used

TABLE II—SERIES A—U S P X METHOD

Per Cent Morphine Recovered		
98.2	94.4	97.5
97.4	96.9	96.3
97.6	94.5	95.8
97.9	94.4	
Average 96.44%		
Average "loss" of anhydrous morphine per assay		17.6 mg
Average "loss" of anhydrous morphine per cc of morphine lime solution		0.58 mg

TABLE III—SERIES B—B P METHOD

Per Cent Morphine Recovered	
Uncorrected	Corrected
94.4	103.1
93.6	102.3
94.6	103.3
93.8	102.5
95.0	103.7
94.3 Av	103.0 Av
Average "loss" of anhydrous morphine per assay	37.6 mg
Average "loss" of anhydrous morphine per cc	0.72 mg

(Three analysts participated in Series A, and two in Series B, C, D)

Several of the assays in Series A are obviously too high. They are higher than would be expected even on the basis of only the theoretical solubility of morphine in the assay solvents. We attributed these high results to inclusion of titratable lime compounds with the precipitated morphine. The difference between the lowest and the highest results corresponds to only 2 mg of calcium oxide or its equivalent of other titratable lime compounds.

TABLE IV—SERIES C—U S P X METHOD, BUT MORPHINE DISSOLVED IN HOT METHANOL

Per Cent Morphine Recovered		
93.8	94.3	94.7
94.3	94.4	94.3
94.2	93.8	
Average 94.2		
Average "loss" of anhydrous morphine per assay		28.6 mg
Average "loss" of anhydrous morphine per cc		0.95 mg

TABLE V—SERIES D—B P METHOD, BUT MORPHINE DISSOLVED IN HOT METHANOL

Per Cent Morphine Recovered	
Uncorrected	Corrected
92.2	100.9
92.4	101.1
93.0	101.7
92.6	101.3
92.4	101.1
92.6	101.3
92.5 Av	101.2 Av
Average "loss" of anhydrous morphine per assay	49.8 mg
Average "loss" of anhydrous morphine per cc of morphine-lime solution	0.96 mg

To eliminate interference from lime we ran another series of assays of the morphine by the U S P and B P tests, but dissolved the precipitated morphine from off the filter with several portions of hot neutral methanol. To the methanol

solutions of the morphine a measured volume of tenth-normal sulphuric acid was added, then the solution diluted with about 2-3 volumes cold water, allowed to cool and the excess acid titrated with tenth-normal sodium hydroxide, using methyl red as the indicator. In some of the assays, where a larger volume of methanol had to be used, the greater part of it was evaporated off after dilution with water. In methanol-water solution the morphine titrated 99.93 and 100.10%.

The results of Series C and D, and especially C, are more concordant among themselves than in the corresponding Series A and B. It will also be noted that by dissolving in hot methanol the yields by both the U S P and B P assays are about 2% lower than when the morphine is directly dissolved in standard acid.

Series C and D practically substantiate the validity of the correction of 1 mg per cc of morphine-lime solution. The question now was how to account for the large correction.

NOTE In all the assays of morphine from here on where lime was used the precipitated morphine was dissolved in hot methanol.

When an excess of the finely powdered morphine was shaken with water, alcohol and ether, in the proportions of the U S P assay for opium 30 cc of the filtered aqueous layer gave upon evaporation 10 mg of anhydrous morphine. From 15 cc of the ether about 1.5 mg of morphine was obtained on evaporation.

Portions of 0.50 Gm of the morphine were dissolved in 30 cc of water with a slight excess of normal hydrochloric or meconic acid, 3.5 to 4 cc of normal ammonia added and allowed to stand over night. This quantity of ammonia gives approximately the same excess of alkalinity as in the U S P assay. The precipitated morphine, after filtering and washing with ice-cold water, was dissolved in tenth-normal H_2SO_4 and back titrated with 0.1N NaOH. The recoveries of morphine were 98.2, 97.7 and 98.0 per cent. Repeating the experiments in presence of 2 cc alcohol and 15 cc ether, as in the U S P opium assay, 96.7, 97.2 and 97.0 per cent of the morphine were precipitated. These recoveries correspond to a loss of about 14 mg of anhydrous morphine, leaving about an equal quantity of additional loss when assayed by the U S P method to be accounted for.

Adsorption of morphine on the lime suggested itself as a likely cause for the increased loss. If this assumption were valid, less morphine should be adsorbed if less lime is used and vice versa. We accordingly made one assay of the morphine by the U S P method, but using 2 Gm of lime instead of 4 Gm, and one assay by the B P method, but using 4 Gm of lime instead of 2 Gm. In the former, there was about 1% increase in the quantity of precipitated morphine, in the latter an additional loss of about 1.5% was sustained. These results do seem to indicate adsorption of some morphine on the lime, but not sufficient to account for all the loss in excess of the normal solubility in the assay solvents. Moreover, the loss per cc of lime-morphine solution, as shown in Tables IV and V, is the same for the U S P and B P assay methods, notwithstanding the different quantities of lime used.

Many alkaloids are known to react with ammonium salts on heating, the alkaloid being converted into the salt of the anion of the ammonium salt used and ammonia liberated. We found that with morphine the same reaction takes place in an aqueous solution of ammonium chloride at room temperature. It was shown

before that practically 98% of the morphine was precipitated from its solution by ammonia. When the same experiments were made in the presence of 0.5 Gm and 1 Gm of ammonium chloride, the precipitation amounted to 96.4 and 95.3 per cent, respectively. When, in addition to the ammonium chloride, the precipitation was made in the presence of alcohol and ether in the proportions of the U. S. P. assay, the corresponding recoveries were 96.0 and 94.9 per cent. A summation of the foregoing results is presented in Table VI.

TABLE VI

	Per Cent Morphine Recovered by Precipitation
1 Aqueous solution precipitated with ammonia	98.0
2 Ditto, in presence of 0.5 Gm ammonium chloride	96.4
3 Ditto, in presence of 1 Gm ammonium chloride	95.3
4 As 1, but in presence of 2 cc alcohol and 15 cc ether	97.0
5 Ditto 4, but with 0.5 Gm ammonium chloride	96.0
6 Ditto 4, but with 1 Gm Ammonium chloride	94.9

The effect of ammonium chloride on the amount of morphine precipitated was corroborated by assaying the morphine by the U. S. P. method, but using 0.5 Gm of ammonium chloride instead of 1 Gm. The following table illustrates the results.

TABLE VII

1 Gm NH_4Cl	0.5 Gm NH_4Cl
93.6	95.3
94.2	95.0
93.8	95.1
93.9 Av	95.1 Av

The foregoing data clearly indicate that the ammonium chloride is responsible for holding in solution about 2%, or at least about 10 mg, of morphine in the U. S. P. assay. They also disclose that 0.5 Gm of ammonium chloride is ample for the precipitation of the morphine from the lime solution, and that with this quantity of ammonium chloride an increased precipitation of the morphine amounting to 1% or over, is obtainable. As a matter of fact, the *Netherland Pharmacopœia* uses 0.2 Gm ammonium chloride for 2 Gm of opium, which corresponds to 0.4 Gm NH_4Cl for 4 Gm of opium in the U. S. P. assay.

Ammonium sulphate exerts a much smaller solvent effect than ammonium chloride. For instance, when 0.5 Gm of morphine was dissolved in 30 cc water with just sufficient sulphuric acid, 2 cc alcohol and 1 Gm of ammonium sulphate added and precipitated with 3.5 cc of normal ammonia, 97.4% of the morphine was recovered.

The aqueous layers, exclusive of the washing, from several of the assays in Series C and D, as well as in similar experiments not reported here, were nearly saturated with sodium chloride and extracted with 4 to 6, 25-cc portions of chloroform—alcohol mixture. The extract, after washing with a small quantity of water, was evaporated, the residue dissolved by warming with fiftieth-normal acid and the excess acid titrated with fiftieth-normal sodium hydroxide. From the mother liquor of the U. S. P. assays the alkaloid recovered ranged from 9 to 14 mg with an average of 12 mg corresponding to about 40% of the morphine "lost" in the assay.

From the B P assays the recovery ranged from 17 to 22 mg, also corresponding to about 40% of the unprecipitated morphine. From the aqueous mother liquors of the experiments summarized in Table VI, 80 to 85 per cent of the morphine held "in solution" was recovered, giving a total recovery of about 99%. We are unable yet to account for this phenomenon. The only difference between the two is the presence of some calcium chloride or possibly even some calcium hydroxide in the U S P or B P assays.

On several occasions when the same assay of the morphine was repeated but at a different time, the results were more divergent than could be accounted for by the average error, notwithstanding that the errors in assaying pure morphine are to be expected to be greater than in many other types of quantitative determinations. It was suspected that the difference may be due to the difference in temperatures prevailing during the precipitation of morphine over night. The suspicion was corroborated, as shown in the following table, by running two sets of assays by the U S P method. In one set the precipitation was allowed to take place at room temperature—about 28° C, and in the other at about 8° C.

TABLE VIII—RESULTS SHOWING THE EFFECT OF TEMPERATURE ON RECOVERY OF MORPHINE

Temperature during Precipitation about 28° C	Per Cent Morphine Recovered	Temperature during Precipitation about 8° C
93.6%		95.7%
94.5		95.5
93.4		95.8
—		—
93.8 Av		95.7 Av

In average laboratories such variations in temperature do not, of course, obtain, but a 10° difference between the winter and summer is not at all uncommon, and the same assay made at 20° and 30° C may show a variation of about 1%.

We believe that the markedly lower recoveries at the higher temperature is primarily due to the greater solubility exerted by the ammonium chloride at that temperature.

It has been indicated in the literature that in the assay of opium, and especially so by the lime method, small quantities of other alkaloids, notably codeine, are co-precipitated with the morphine. We have found this to be the case in a number of samples of opium we examined. The results are recorded later on. The effect of the presence of other alkaloids on the precipitation of pure morphine was determined by assaying a "composition opium" by the U S P method, after dissolving it in either hydrochloric or meconic acid. The "composition opium" for each assay was made up of 1.050 Gm of morphine, about 0.4 Gm of narcotine, 0.1 Gm of codeine, about 0.08 Gm papaverine, 0.07 Gm of thebaine and about 0.2 Gm of morphine free tar obtained in the process of manufacture of morphine. The proportions of the other alkaloids corresponds, approximately, to those present in average opium.

The results are on the average about 1% higher than those obtained with morphine alone (compare Table IV).

Morphine, like most other alkaloids, is "salted" out by sodium chloride or sulphate. If in the assay of morphine, in the form of hydrochloride or meconate,

TABLE IX—SERIES E—"COMPOSITION
OPIUM" ASSAYED BY U S P X
METHOD

Per Cent Morphine Recovered	
95 6	95 6
94 8	95 8
95 2	95 4
Average 95 4	

by the U S P method the morphine-line solution is saturated with sodium chloride before precipitation with ammonium chloride, the amount of morphine precipitated is about 1 5% higher than without sodium chloride. We also observed, however, that saturation with sodium chloride in the assay of "Composition opium" also precipitates a somewhat greater proportion of the by-alkaloids.

EXPERIMENTS WITH OPIUM

Effect of Methanol—Several samples of opium were assayed by the U S P method and also by the modification of dissolving the precipitated morphine in hot methanol, etc., as described under pure morphine. The results were as follows:

TABLE X—EFFECT OF DISSOLVING THE PRECIPITATED MORPHINE IN METHANOL

	Per Cent Anhydrous Morphine U S P Assay Not Dissolved in Methanol	U S P Assay Dissolved in Methanol
Opium No 7	15 07	14 74
Opium No 8	12 83	12 58
Opium No 21	12 04	11 80

On the basis of the morphine contents the difference is about 2%, practically the same as obtained with morphine.

Effect of Ammonium Chloride—The effect of using only 0 5 Gm of ammonium chloride in the assay of opium instead of 1 Gm is shown in the following tabulation. In both sets of assay the precipitated morphine was dissolved in methanol.

TABLE XI—PER CENT MORPHINE FOUND

	1 Gm of Ammonium Chloride	0 5 Gm of Ammonium Chloride
Opium No 7	14 82	15 05
Opium No 8	12 63	12 96
Opium No 21	12 08	12 21

Effect of Temperature—The effect of the temperature on the amount of morphine precipitated in assaying opium practically confirmed the results found with morphine. Two samples of opium precipitated at a temperature of 28–30° C gave 15 25 and 11 85% but when the precipitation was made at about 8° C the percentages of morphine were 15 35 and 12 03%.

Co precipitated Alkaloids—In the experiments with "composition opium" described under morphine, an increased yield of about 1%, due to the precipitation of by alkaloids, was obtained. The by alkaloids co precipitated with morphine in the opium assay is considerably greater. For the determination of the co precipitated alkaloids, the morphine solution, after titration was treated with 10 cc of 5% sodium hydroxide and shaken out with several portions of chloroform. The combined chloroform extracts were shaken with small quantities of water to remove any free alkali, filtered and evaporated nearly to dryness. A measured volume of fiftieth normal sulphuric acid was added, warmed until the residue was dissolved and the odor of chloroform dissipated, cooled and then the excess of acid titrated with fiftieth normal sodium hydroxide using

methyl red as the indicator The percentages of other alkaloids thus found, calculated as morphine, are shown in the following table

TABLE XII—OPIUM BY ALKALOIDS CO PRECIPITATED WITH THE MORPHINE

	Per Cent Anhydrous Morphine <i>U S P Assay</i>	Per Cent Non phenolic Alkaloids Co precipitated with the Morphine	Per Cent Non phenolic Alkaloids on the Basis of the Morphine
Opium No 11	15 20	0 45	2 96
Opium No 12	12 42	0 34	2 74
Opium No 12 A	14 76	0 53	3 59
Opium No 13	15 06	0 45	2 99
Opium No 16	14 64	0 39	2 67
Opium No 18	12 58	0 35	2 78
		0 42 Av	2 96 Av

These determinations represent only the non-phenolic by-alkaloids Opium contains also several phenolic alkaloids other than morphine If they should be present in appreciable quantities they will probably be co precipitated with the morphine, and the extraction of the sodium hydroxide solution of the alkaloids with chloroform would not eliminate them

Shaking out of the aqueous mother liquor from several of the opium assays with chloroform-alcohol, after saturation with sodium chloride, yielded from 8 to 13 mg of morphine, with an average of 11 mg This recovery is practically identical with that obtained from the aqueous mother liquor in the assays of morphine

Within the last two or three years a new type of assay for opium has been advanced, the essential features of it being the following The aqueous or acid extract of the opium is treated with an excess of sodium hydroxide solution and shaken out with an immiscible solvent such as chloroform Non-phenolic alkaloids are thus removed The alkaline solution holding the morphine is acidified with HCl, then made alkaline with ammonia and shaken out with a suitable solvent The second shaking out extracts the morphine which after evaporation of the solvent is titrated

An assay of this type, which we would designate as "Assay by immiscible solvents" is due to Buchbinder, formerly of the Bureau of Chemistry He uses chloroform-alcohol for the extraction of the morphine from the ammoniacal solution Assaying morphine, in hydrochloric acid solution, by the Buchbinder method we recovered 98.4 and 97.1% We also assayed four samples of opium by the same method The results compared with those obtained by the regular U S P method were as follows

TABLE XIII

	U S P Method	Buchbinder Method
Opium No 53	11 93	12 15
Opium No 65	14 20	14 51
Opium No 69	13 62	13 90
Opium granular	10 50	11 01

The Buchbinder method gives a slightly higher test than the U S P method This may be due to the fact that in the Buchbinder method an aliquot portion is taken from a solution in which there is present the insoluble matter from the opium, barium sulphate derived from barium chloride used in the assay, etc

Another "assay by immiscible solvents" has been proposed by Eder and Stucki. They digest the opium first with normal hydrochloric acid, claiming that the acid liberates more morphine, and use a mixture of chloroform and isopropanol for both removing the non-phenolic alkaloids as well as for the extraction of the morphine.

The "assays by immiscible solvents" have, *first*, the important advantage that no correction for solubility of morphine is necessary, and *second*, the isolated morphine is not contaminated with non-phenolic alkaloids, although other phenolic alkaloids may be included as morphine. These assays have, however, one great disadvantage. On account of the limited solubility of morphine in the solvents only a small quantity of opium, 1 or 2 Gm, can be used for the assay. Such a small sample could not be well representative of the opium, especially when dealing with Gum Opium. We believe, however, that the above proposed assays for opium by immiscible solvents have laid the ground work for further investigation which we hope will result in perfecting the method and making it of practical use.

SUMMARY

Dissolving the morphine, obtained in the lime assays, in hot methanol before titration eliminates, on the basis of the morphine contents, about 2% of foreign titratable substances calculated as morphine.

Assays of pure morphine by the U S P and B P methods confirm the "assay-loss" of practically 1 mg of morphine for each cc of lime-morphine solution as indicated in the latter Pharmacopœia. This "loss," however, will fluctuate somewhat unless definite and uniform conditions are maintained in the assay.

About one-half of the assay loss is attributable to the solubility of morphine in the assay solvents. The greater part, if not all, of the balance of the "loss" is caused by the solvent action of the ammonium chloride on morphine. Adsorption on the lime may also be responsible for a small portion of the assay-loss.

It therefore follows, and it has been confirmed by experiment, that the larger the quantity of ammonium chloride used the greater will be the quantity of morphine dissolved. By using 0.5 Gm of ammonium chloride in the U S P assay, 1 to 1.5 per cent more morphine was precipitated than when 1 Gm was used.

The temperature during precipitation of the morphine in the lime assays affects the quantity of morphine held in solution. When precipitation takes place at 28°-30° C about 2% more of the morphine is dissolved than at 8° C. We attribute the increased solubility largely to the greater solvent action of the ammonium chloride at the higher temperature.

It is recommended (1) that in the U S P assay 0.5 Gm of ammonium chloride be used instead of 1 Gm. This quantity, 0.5 Gm is several times the theory for a 15% opium, and (2) that the temperature of precipitation (standing over night) be restricted to about 10° C.

Saturation or near-saturation of the lime-morphine solution with sodium chloride before adding the ammonium chloride raises 1 to 2 per cent the quantity of the morphine precipitated. In the case of opium, however, the use of sodium chloride will also increase the co-precipitation of the by-alkaloids.

The morphine precipitated in the U S P and probably also in other lime assays carries about 3% non-phenolic by-alkaloids which is included in the assay as

morphine Since opium contains also other alkali-soluble alkaloids than morphine, these, if present in appreciable quantities, may also be included with the morphine and thus show an apparent higher morphine content Pharmacopœias applying a correction for "assay-loss" should, as a matter of scientific accuracy and of fairness to the manufacturers of morphine and its derivatives, who consume 90% or more of the total legitimately used opium, take cognizance of the occlusion of by-alkaloids in the morphine and make the necessary correction

By coincidence of counterbalancing error factors, the U S P assay of opium appears to indicate very closely the true morphine content

The "total extraction" of the opium which has been practiced in the assay by the several revisions of the U S P is an important point in its favor It obviates errors in aliquot portions due to the variable amounts of water and insoluble matter in the opium In the assay method under consideration by the Committee of the League of Nations, published elsewhere, these sources of "inaccuracies" are corrected for by making separate determinations of the water content of the opium, and of the total extractive matter

Corrections, almost of any kind, are looked upon with disfavor in analytical procedures They are most uncertain and most undesirable when the corrections involved are of appreciable magnitude

Assays based on the isolation of the morphine, free from by-alkaloids, through the use of immiscible solvents offer a possible solution of the problem provided they can be worked with reasonably large samples They should also strive to avoid such aliquots as may introduce any element of error, and, *ipso facto*, should not require an undue length of time

GELATIN AS A STABILIZING COLLOID FOR OIL IN WATER EMULSION SYSTEMS *

BY LINWOOD F TICE ¹

Various workers have investigated the efficiency of gelatin as an emulsifying agent Briggs and Schmidt (1) found gelatin to be comparatively inefficient as an emulsifying agent Clayton (2) reported drop numbers for cottonseed and peanut oils in aqueous gelatin solutions which indicated that gelatin possessed considerable ability to reduce the interfacial tension between oil and water Holmes and Child (3) studied the effect of added electrolytes upon the emulsion system kerosene, gelatin and water and concluded that the important factor was the conferring of a favorable viscosity to the gelatin solution Kernot and Knaggs (4) using the Donnan pipette measured the drop numbers of various oils against gelatin solutions Limburg (5) showed that a lowered p_H favors the adsorption of gelatin around oil globules

In reviewing the results of these workers it is very difficult for one to reach any definite conclusions as to the exact status of gelatin as a practical emulsifying agent The following criticism may be advanced concerning these results

* Scientific Section, A Ph A, Portland meeting, 1935

¹ Department of Research Philadelphia College of Pharmacy and Science Investigation conducted in behalf of the Edible Gelatin Manufacturers' Research Society of America Inc

I The use of the drop number of an oil against some solution, although of considerable indicative value, cannot be taken as conclusive evidence in regard to the emulsion stabilizing ability of such a solution

II In no case was really effective emulsification of commonly used oils, *e g*, cod liver oil, heavy mineral oil, etc., actually accomplished. Such emulsions as were produced were of theoretical interest but they possessed no practical value

III Such inefficient methods of dispersion were employed that there exists considerable doubt as to the real meaning of the results

It must be realized that a substance may be an excellent stabilizer in an emulsion system, effectively reducing the interfacial tension between the two phases, but at the same time due to its physical properties it may not favor the easy dispersion of the phase to be dispersed. Consequently, using crude methods of dispersion one is apt to obtain misleading results as to the true stabilizing power of an emulsifying agent

When a highly efficient device which insures an initially highly disperse emulsion is employed then the real ability of a substance to stabilize the system can be determined

The object of this investigation was to determine the efficiency of gelatin as an emulsion stabilizing colloid, the specifications under which it is most effective for such use, and lastly, if possible, to submit practical working formulas in which gelatin might be employed as the emulsifying agent

COLLECTION OF MATERIALS

Samples of every type and grade of gelatin were obtained from several of the largest manufacturers of this product. All the data concerning the method of manufacture and the control reports were submitted with each sample

The next step was the investigation of emulsifying devices in order to obtain the most efficient unit available. The importance of such an investigation has already been explained, namely, to eliminate all possibility of misleading results due to inefficient mechanical treatment

Several colloid mills were examined and the degree of dispersion accomplished by each noted. Then a laboratory homogenizer manufactured by Manton-Gaulin was studied. The results were as follows. Among the colloid mills there is a wide difference in their relative efficiencies. The homogenizer, however, for liquid emulsions provided the best degree of dispersion and the greatest uniformity of product. It is true that colloid mills are not as cumbersome and are more generally applicable for other uses than the homogenizer, but for liquid emulsions they did not prove as satisfactory

Furthermore, gelatin being strongly adsorbed and probably preferentially so at a water/air interface, the homogenizer which almost entirely excludes air was thought to be more satisfactory for the preparation of emulsions containing gelatin

Having now decided upon the method of dispersion to be used and having available every possible type of gelatin, the actual experimental work was begun

EXPERIMENTAL PART

The experimental method chosen was the preparation of emulsions of heavy liquid petrolatum containing in each case 50 per cent of oil, the dispersion medium

being aqueous gelatin solutions in which the type of gelatin, its concentration and the p_H of the solution were the factors varied. In each case the mixed phases were homogenized at a pressure of approximately 3500 lbs. The results are tabulated below.

A—Bone Gelatin, 200 Bloom

	Concentration	p_H	Condition of Emulsion
1	0.5%	5.8	Poor
2	1.0%	5.8	' gel formation
3	1.0%	4.0	' "
4	1.0%	3.0	slight gel formation
5	1.0%	7.0	"

B—Calfskin Gelatin, 200 Bloom

1	0.5%	6.1	Poor
2	1.0%	6.1	gel formation
3	1.0%	4.0	'
4	1.0%	3.0	slight gel formation
5	1.0%	7.0	'

C—Porkskin Gelatin, 250 Bloom

1	0.5%	4.6	Fair
2	1.0%	4.6	Good gel formation
3	1.0%	4.0	' ' '
4	1.0%	3.0	Excellent
5	1.0%	7.0	Poor gel

D—Porkskin Gelatin Isoelectric

1	0.5%	8.0	Poor slight gel formation
2	1.0%	8.0	' gel formation

E—Bone Gelatin, Isoelectric

1	0.5%	4.7	Poor slight gel formation
2	1.0%	4.7	gel formation

From the above results it will be seen that the behavior in the case of C—4 was outstandingly good. These results were checked and it was found that a porkskin gelatin at a p_H of 3 gave an excellent, highly dispersed emulsion.

Upon the basis of these results the following explanation was derived which seems to provide a sound theoretical reasoning on which basis the above behavior can be interpreted.

Bone and calfskin gelatin are derived following a preliminary liming treatment of the precursor. The excess lime is removed by washing and acid washing followed by partial hydrolysis and extraction of the highly purified collagen by heating with water. In the case of porkskin gelatin, fresh frozen porkskins are treated with acid in the initial stage, followed by partial hydrolysis and extraction of the collagen. It is already known (6) that gelatin derived from alkali-treated precursors and gelatin obtained from an acid-treated precursor have quite different isoelectric points, the former having an isoelectric point at a p_H of 4.7 and the latter having an isoelectric point falling at a p_H of approximately 8.

As the p_H of a gelatin solution is lowered from its isoelectric point the gelatin becomes positively charged, such charge increasing with lower p_H levels, according to the equilibrium positive gelatin \rightleftharpoons isoelectric gelatin \rightleftharpoons negative gelatin.

Oil globules dispersed in water have been shown to be negatively charged which is as would be expected inasmuch as the dielectric constant of oil is lower than that of water

Therefore, in order to encourage the adsorption of gelatin at an oil/water interface the greater the charge the more readily should such adsorption take place

Starting with a gelatin from a limed precursor whose isoelectric point lies at 4.7 it will readily be seen that in order to confer on it highly positive properties a much lower p_H is needed than would be required by a gelatin from an acid-treated precursor having an isoelectric point at a p_H of 8. This seems to be a logical explanation of the superiority of porkskin gelatin in stabilizing an emulsion over bone or calfskin gelatin at the p_H of 3.

It was evident that if this reasoning were correct bone and calfskin gelatin at a still lower p_H , say approximately a p_H of 1, should make possible equally satisfactory emulsions as those given by porkskin gelatin at the higher p_H . This was definitely borne out experimentally.

Another difficulty using ordinary bone or calfskin gelatin is that, at ordinary p_H levels, if sufficient gelatin is used to provide the necessary concentration gelation of the product results. With porkskin gelatin this tendency is very much reduced, and at a p_H of 3 gelation of even 1% solutions is almost entirely prevented. The reason for this difference is explained by the fact that the degree of hydration of gelatin is proportional to the differential between its p_H and that at its isoelectric point. The degree of hydration of a porkskin gelatin at a p_H of 3 would consequently be expected to be considerably more than that present in a bone or calfskin gelatin at that same p_H .

Although emulsification is quite efficient at a p_H of 1 with bone and calfskin gelatin, for most purposes at least this p_H level contributes too great an acidity to the product and for emulsions to be taken internally the use of porkskin gelatin at a p_H of 3 is recommended.

Porkskin gelatin as sold upon the market has a p_H of 4.0-4.6. Consequently, an adjustment of the p_H level is necessary before it may be used in the preparation of such emulsions. In the above experiments such adjustments were made on the basis of a graph on which the ordinates were the cc. of tenth-normal hydrochloric acid added per 100 cc. of 1% gelatin and the abscissæ the resulting p_H levels. Between the extremes p_H 4.6 and p_H 3 the plotted points produced practically a straight line and it was found that with various lots of gelatin of the same type, knowing their initial p_H , it was possible within reasonable limits to calculate by proportion the required amount of acid that should be employed.

It was thought, however, that for the practical worker it would be much easier to adjust the p_H with tartaric acid. Tartaric acid being a quite pure and uniform crystalline substance, the addition could then be made on a weight basis. A graph was prepared in which the milligrams of tartaric acid added per 100 cc. of 1% gelatin was represented as the ordinates, the abscissæ being the observed p_H levels of such solutions. Such a graph is illustrated (Fig. 1).

Emulsions were made using the proper amount of tartaric acid to provide a p_H of 3. Such emulsions, however, seemed considerably more acid to the taste than similar emulsions made with gelatin whose p_H was adjusted with hydrochloric acid. The reason for this may be that some tartness lies in the undissociated

tartaric acid molecules, such tartness being an inherent property of these molecules to the taste. Fortunately, it was found that at a pH of 3.2, where only three-fifths as much tartaric acid was required, emulsification was satisfactory and the gelation tendency sufficiently depressed by the added liquefying effect of the tartrate that gelation did not occur. Consequently, if the pH is adjusted by the use of hydrochloric acid the level should be 3, if tartaric acid is used a level of 3.2 is most satisfactory.

Alcohol, in moderate amounts, sugar and glycerin were found to be compatible with gelatin in emulsion formulas. In fact, the last two seemed to actually exert a favorable influence on the resulting product.

Various samples of experimental emulsions were aged to determine their stability, others were placed in a refrigerator and a third lot were subjected to oven temperatures of approximately $45^{\circ}C$.

The result of several months' aging at room temperatures is a very slight creaming and a gradual loss in viscosity. The extent of creaming is considerably less than many comparable commercial emulsions. The gradual loss in viscosity was not unexpected as, under such conditions, a slow hydrolysis of the gelatin protein is of course unavoidable. The degree of dispersion and condition of emulsification remained excellent.

Those emulsions placed in the refrigerator became somewhat thick and viscous but no actual solidification took place. It was in some cases necessary to shake the bottle before pouring, due to the formation of a thin surface film which, however, was easily broken on shaking.

A very interesting phenomenon was observed with emulsions placed in the oven at $45^{\circ}C$. When such emulsions were made with hot gelatin solutions and subsequently cooled they were perfectly stable. On the other hand, when made with cold gelatin solutions the emulsions after being kept in the oven showed a slight separation of oil, which separation, however, was not continuous. There are two possible explanations seen for this—first, it may be that the $sol \rightleftharpoons gel$ change due to change in temperature may cause a certain amount of dispersed oil to separate when made in the cold and then warmed, or secondly, the cold gelatin solution may, due to its greater viscosity, entrap air, this entrapped air at the same time enclosing oil globules. Upon heating, the air being expelled a certain small amount of un-

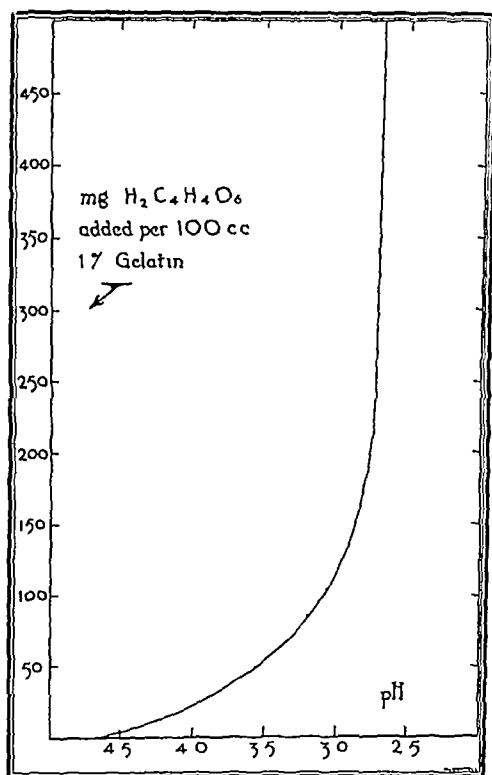


Fig 1

emulsified oil is liberated. This latter explanation seems the more probable of the two. At any rate, such a defect is overcome by using a hot gelatin solution in producing the emulsion.

Realizing that a slow hydrolysis of gelatin might in time entirely destroy its stabilizing influence, the following experiment was carried out. A 5% solution of gelatin at a p_H of 3 was heated at 100° C for 3 hours. At the end of this time it had lost all power of gelation and it was, when cold, quite limpid, yet it still quite effectively retained its power to stabilize an emulsion containing 50 per cent mineral oil. Of course, the hydrolysis had not yet completely formed the underlying aminoacids, although doubtlessly it was considerably progressed. This experiment gave good evidence that although hydrolysis would unavoidably lessen the viscosity it should not be expected to disrupt the emulsion system through total loss of stabilizing influence.

It may be mentioned here that loss in viscosity, although it accelerates slightly the rate of creaming, is not nearly as undesirable as an increase in viscosity upon aging. In the latter case, actual solidification may occur whereupon pouring may become impossible.

A comparison of relative efficiencies of low and high Bloom gelatins showed conclusively that the higher Bloom gelatins are to be preferred in emulsion work. Consequently, porkskin gelatin, for example, was selected having a Bloom rating of at least 250 Gm. No difficulty should be experienced in obtaining such a Bloom strength gelatin of the porkskin type, although with bone and calfskin gelatin a product of this high a Bloom rating is not usually marketed.

There are several advantages to be obtained by the use of gelatin as an emulsifying agent:

I It is an excellent stabilizer.

II It possesses unusual economy due to both its low cost and the small amount required. It was calculated that for one gallon of emulsion the cost of gelatin required would be less than three cents.

III For emulsions to be administered internally it greatly reduces the caloric intake as compared with acacia. Furthermore, being very easily digestible it is less disturbing in cases of gastro-intestinal disorders.

IV In technical emulsions it eliminates the presence of the, in many cases, undesirable gum and permits the preparation of highly fluid yet slightly acid emulsions.

The only possible disadvantages encountered are first, the necessity of a homogenizer, and second, the gradual loss in viscosity of the finished product.

The first disadvantage is meaningless on a large scale as most manufacturing organizations possess such equipment. On a small scale there are now available numerous quite inexpensive hand homogenizers (7) which make possible the use of gelatin, *e. g.*, by the prescription pharmacist.

It may be mentioned that the new United States Pharmacopœia has its text so worded that gelatin may be used in official emulsions replacing acacia.

PRACTICAL APPLICATIONS

Some formulas using gelatin as the sole emulsifying agent are presented in order to illustrate the practicability of its use.

A

I	{	Gelatin (0.6% porkskin 250 Bloom)	6.0	Gm
		Tartaric acid <i>or</i> (Hydrochloric acid <i>q s</i>)	0.450	Gm *
	{	Syrup	100.0	cc
		Water <i>q s</i>	<hr/>	
II	{	To make	440.0	cc
		Vanillin	0.035	Gm
		Alcohol	60.0	cc
III		Heavy mineral oil	500.0	cc
			<hr/>	
To make about			1000.0	cc

Add the gelatin and tartaric acid to about 300 cc of cold water, allow to stand a few minutes then heat until dissolved. Add the syrup and finally enough water to make 440 cc (I). While still quite warm add II, then III, and mix well avoiding the inclusion of air. Finally, homogenize and bottle. Homogenization should be repeated if necessary until all the oil is completely dispersed.

Such an emulsion conforms to the new U S P XI monograph for Emulsion of Liquid Petrolatum.

B

I	{	Gelatin (0.5% porkskin 250 Bloom)	5.0	Gm
		Tartaric acid <i>or</i> (Hydrochloric acid <i>q s</i>)	0.375	Gm *
		Methyl parahydroxy benzoate	2.0	Gm
		Water <i>q s</i>	<hr/>	
II	{	To make	500.0	cc
		"Lemon Oil"	250.0	cc
		Light mineral oil	250.0	cc
		<hr/>		
To make about			1000.0	cc

The directions here are similar to those in "A". Methyl parahydroxy benzoate replaces the alcohol as a preservative. Such a formula provides an excellent furniture polish emulsion.

In preserving emulsions made with gelatin the only organisms that can develop at such a p_H are the molds and yeasts. All proteolytic bacteria are inactivated by the acidity. Consequently, the problem of preservation is no more complicated than that arising from the use of any carbohydrate emulsifier as, for example, acacia.

SUMMARY

I Gelatin is a very efficient stabilizing colloid for oil-in-water emulsion systems.

II The important factors to be considered in connection with gelatin for this purpose are first, the preliminary treatment received by its precursor (which determines its isoelectric point) and second, the p_H of the solution to be used.

III Gelatin from acid-treated precursors, having an isoelectric point at p_H 8, requires a p_H of approximately 3 to effectively stabilize an emulsion, whereas gelatin

* The amount of tartaric acid may vary slightly depending upon the gelatin used. If hydrochloric acid is used, the amount necessary to give a p_H of 3 must be determined by experiment. If a thinner emulsion is desired 5 Gm of gelatin may be used instead of 6 Gm.

from alkali-treated precursors, having an isoelectric point at p_H 4.7, requires a p_H of approximately 1

IV The advantages of gelatin for use in emulsions are enumerated

V The efficiency of several colloid mills as compared with that of a homogenizer in preparing liquid emulsions is reported

VI Practical formulas and directions for the use of gelatin in emulsions are presented

REFERENCES

- (1) Briggs and Schmidt, *J Phys Chem*, 19, 484 (1915)
- (2) Clayton, *Kolloid Zeitschrift*, 28, 202 (1921)
- (3) Holmes and Child, *J A C S*, 42, 885 (1926)
- (4) Kernot and Knaggs, *J Soc Chem Ind*, 47, 96T (1928)
- (5) Lumburg, *Rec trav chim*, 45, 885 (1926)
- (6) Briefer and Cohen, *Ind Eng Chem*, 20, 408 (1928) Briefer, *Ibid*, 21, 266 (1929)
- (7) This author, *Am J Pharm*, 107, 158 (1935)

A NOTE ON THE ACTION OF ALKALIES AND ALKALI SALTS ON ANTIPYRINE *¹ 2

BY LOYD E HARRIS AND ERCELL D TEBOW

A prescription that called for a solution of antipyrine in a concentrated solution of potassium citrate was brought to the laboratory for an explanation. A colorless liquid separated which disappeared on dilution of the mixture with water. Or, on standing, it gradually changed to a crystalline substance. A search of the literature gave no information as to what was happening, so the problem was investigated in the laboratory.

EXPERIMENTAL

A few grams of the liquid precipitate were obtained by adding antipyrine to a saturated aqueous solution of potassium citrate. This was separated by using a separatory funnel. Crystals began forming after standing a few hours and in about 48 hours the mass was completely crystallized. The crystals resembled antipyrine in physical appearance and the melting point was found to be 111° C which is the same as the U S P compound. A mixed melting point with antipyrine did not cause any change. The U S P X color tests were positive, thus, further indicating that the crystals were antipyrine.

A saturated alcoholic solution of picric acid was added to a boiling aqueous solution of the immiscible liquid. Almost immediately, long yellow crystals began to appear. After washing with water and drying, their melting point was determined to be 188° C, antipyrine picrate was prepared in a similar manner and its melting point was the same.

A second portion of the aqueous solution of the immiscible liquid was made acid with hydrochloric acid (no change was apparent in the dilution used) and then sodium nitrite was added. The green precipitate, which formed, was separated by filtration, washed with water and then dried. The melting point was 200° C and corresponds to the melting point of nitroso antipyrine, prepared in the laboratory.

* Scientific Section, A Ph A, Portland meeting 1935

¹ An abstract from a Thesis submitted by Ercell Dale Tebow to the Graduate Faculty, University of Oklahoma, in partial fulfillment of the requirements for the degree of M S in Pharmacy, 1933

² From the Pharmacy Laboratory School of Pharmacy, University of Oklahoma

Portions of the immiscible fluid obtained from each of the alkalis and alkali salts used were burned, in separate evaporating dishes at temperatures less than red heat. There was no ash or residue, except in one instance (this was probably due to incomplete separation of the liquids)

The liquid separated and came to the top when antipyrine was mixed with alkali salts, but with sodium hydroxide and potassium hydroxide, in a few instances, it settled to the bottom. This was apparently due to the different specific gravities—the specific gravity of the separated immiscible liquid was found to be 1.0965 at 25° C.

Crystals formed almost immediately when potassium hydroxide and sodium hydroxide were used, but with potassium citrate and sodium citrate the fluid would frequently remain liquid for several days.

The percentages of alkali and antipyrine were determined at which the immiscible liquid started to separate. In determining the sodium citrate, potassium citrate and antipyrine, the percentages were calculated from the amount of water used and not the total volume of the solution. Due to the hygroscopic nature of potassium hydroxide and sodium hydroxide they were weighed and dissolved in enough water to make a definite volume and the percentages calculated. Equal amounts of antipyrine were placed in test-tubes, a measured amount of water added and after it had dissolved the alkali or alkali salt solution was added from a second burette, shaking after each 0.2 cc., until separation was noticed. The percentage of each was then calculated from the total amount of liquid added. The results are presented in graph form.

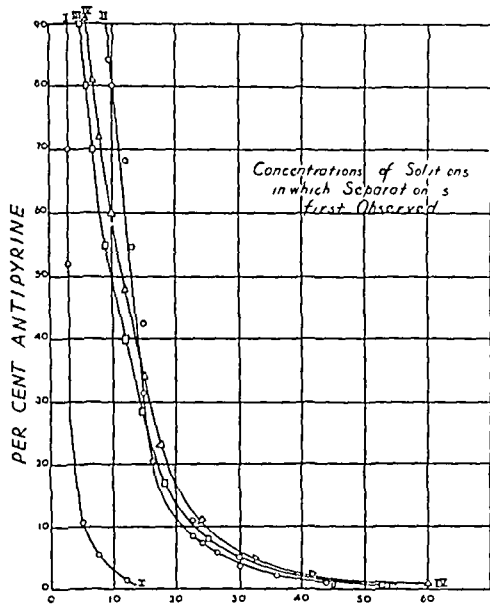


Fig 1—Per cent I sodium hydroxide, II, potassium hydroxide, III sodium citrate, IV, potassium citrate

A number of other alkali salts were tested qualitatively to see if they would produce similar results on solutions of antipyrine. Each caused the separation into two immiscible layers. The salts used were sodium bicarbonate, sodium acetate, sodium carbonate, sodium thiosulphate, potassium bicarbonate, potassium carbonate, potassium acetate, ammonium acetate and ammonium carbonate.

CONCLUSIONS

From the foregoing facts, it is believed that the immiscible liquid obtained by the addition of antipyrine to concentrated solutions of alkalis or alkali salts is an isomeric form, which will change to the usual crystalline form on standing.

QUANTITATIVE ANALYSIS OF BARBITURIC ACID DERIVATIVES

BY KAZIMIERS KALINOWAKI, UNIV OF POZNAN

To a solution of 0.2–0.3 Gm. of the substance to be analyzed in 20–25 mls of acetone or 30–36 mls of ethyl alcohol, 15–20 mls of a normal

solution of NaOH and 20–30 mls of water are added. This clear solution is titrated with a 0.1N solution of AgNO_3 until a turbidity is obtained. As this method is simple and accurate to 0.1 per cent its use is adapted to pharmaceutical laboratories.—*The Pharmaceutical Journal* August 31 1935

PHYTOCHEMICAL NOTES

No 112 THE STEROLS OF *ACHILLEA MILLEFOLIUM* *

BY OLE GISVOLD

In the course of the chemical investigation of milfoil by Katherine Graham (1) a sterol melting at 134-135° had been isolated. Its acetate melted at 123-124°. However, the melting points were not very sharp. A study of the original literature on sterols seemed to indicate that the product might be a mixture rather than a chemical individual.

In order to resolve this sterol mixture, if such it should prove to be, into its components, the acetates were brominated according to Windaus and Hauth (2). When, however, upon standing no separation had taken place, crystallization was induced by the addition of a little alcohol. From the crystals thus obtained, the ether-soluble material was removed by washing. The insoluble residue melted at 203°. Apparently, it may be regarded as the tetrabromide of stigmasterol acetate. The amount obtained was too small to render debromination practicable.

As for the melting point, Windaus and Hauth (2) record 211° as the melting point of stigmasterol acetate tetrabromide. However, melting points of 205° (3), 208° (4) and 210° (5) are also recorded. Moreover, H. Sandqvist and J. Gorton (6), as late as 1930, report 203° as the melting point.

Before attempting the debromination of the ether-soluble brominated sterol acetate, the technique (2) was tried out on the corresponding cholesterol derivative. The attempt was unsuccessful because the zinc dust suspended in the glacial acetic acid coagulated. When absolute alcohol was substituted for glacial acetic acid, the experiment was successful. With this substitution in the technique, the ether-soluble brominated sterol acetate was successfully debrominated. After several recrystallizations, the debrominated acetate melted at 127.5°. Upon saponification the free sterol was obtained melting at 138°. These constants agree with those of sitosterol. Apparently, therefore, the sterol isolated from milfoil is a mixture of stigmasterol and a sitosterol in which the latter predominates.

REFERENCES

- (1) Graham, K., *Jour. A. Ph. A.*, 22, 819 (1933)
- (2) Windaus and Hauth, *Ber.*, 39, 4381 (1906)
- (3) Nabenhamer, F. P., and Anderson, R. J., *J. A. C. S.*, 48, 2972 (1926)
- (4) Power, F. B., and Salway, A., *J. Chem. Soc.*, 105, 212 (1914)
- (5) Beschke, Erich, *Ber.*, 47, 1853 (1914)
- (6) Sandqvist, H., and Gorton, J., *Ibid.*, 63, 1935 (1930)

* OFFICERS ELECT, AMERICAN PHARMACEUTICAL ASSOCIATION FOR 1936-1937

The Board of Canvassers of the AMERICAN PHARMACEUTICAL ASSOCIATION, composed of Gustav Bachman, *Chairman*, Charles V. Netz, and Charles H. Rodgers, all of Minneapolis, Minn., has announced as the result of the mail ballot for the officers of the ASSOCIATION, the election

President-Elect, George D. Beal, Pittsburgh, Pa.

First Vice-President Elect, J. Leon Lascoff, New York, N. Y.

Second Vice President Elect, James C. Munch, Glen Olden, Pa.

Members Elect of the Council, H. C. Christensen, Chicago, Ill., R. P. Fischelis, Trenton, N. J., Ernest Little, Newark, N. J.

These officers will be installed at the next annual meeting of the ASSOCIATION which will be held in Dallas, Texas, the time to be announced later.

* From the Laboratory of Edward Kremers

COMPARISON OF SPECTROMETRIC METHOD AND ANTIMONY TRICHLORIDE TEST FOR ESTIMATION OF VITAMIN A POTENCY *

BY W S JONES AND W G CHRISTIANSEN ¹

For determining the Vitamin A potency of cod liver oil the U S P prescribes a biological assay Any vendor, therefore, who markets this product as U S P oil must be able to show, by the official method, that it complies with the specifications for potency We know that there may be some differences between human response and the response obtained with different species of animals, and that the selection of the test animal is therefore a matter of great importance, but we realize that products of complex composition, used to produce biological effects, should be fundamentally controlled by a biological assay Even though Vitamin itself is a definite chemical compound, in cod liver oil it is associated with many other compounds which may be present in varying amounts and which may modify the biological effect

Thus, for the present, the biological assay must be considered the primary test of potency, and other methods secondary ones, supplying preliminary estimates We present, in this paper, a comparison of the results obtained by two such methods on oils which had been assayed biologically

The first of these tests—the Carr and Price antimony chloride test—is well known and widely used During the years of its use in our several laboratories the minute details of the test, upon which depends the value of the result, have been subjected to careful study and control Much of that work was done in our Biological Research Laboratories

The second test is a physical one, and depends upon the intensity of the absorption band at 3280 Å in the ultraviolet

These chemical and physical tests are of great value in both manufacturing and research They are rapid and inexpensive, and may therefore be used at every intermediate step in both laboratory and plant, supplying quickly and cheaply approximate data which make possible quick decisions and rapid progress, with a reasonable expectancy that the biological assay will confirm the correctness of the action taken It is necessary, of course, always to keep in mind the limits of accuracy of these tests

Various workers,²⁻⁸ using the spectrometer, or physical method, have shown that there exists a definite and consistent relationship between the intensity of the absorption band at 3280 Å in the ultraviolet and the biological assay for Vitamin A

* Section on Practical Pharmacy and Dispensing A Ph A Portland meeting, 1935

¹ Research Department of the Chemical and Pharmaceutical Laboratories E R Squibb and Sons, Brooklyn N Y

² Morton and Heilbron *Biochem J* 22, 993 (1928)

³ Drummond and Morton *Ibid* 23 785 (1929)

⁴ Coward Dyer Morton and Gaddum, *Ibid*, 25 1102 (1931)

⁵ Evers Norman and Smith Brit Pharm Conference (July 24-27 1933), through *Pharm J* 131 128 (1933)

⁶ Lathbury, *Biochem J*, 28 2254 (1934)

⁷ Chevallier and Chabre, *Bull soc chim biol* 16 1461 (1934)

⁸ Emmment, *et al* Symposium, Am Chem Soc meeting New York April 1935

It was highly desirable, therefore, to compare the newer, physical method with the antimony trichloride color test

Our preliminary findings show that the spectrometric method gives no better estimation of Vitamin A potency than does the colorimetric antimony trichloride test as used by us

Eleven oils which had been assayed biologically were tested by the antimony trichloride method and were then sent to laboratories having equipment for the spectrometric assay. Nine oils were sent to Laboratory "A," four of these plus two additional oils were sent to Laboratory "B." In Table I are listed the results of all three assay methods

TABLE I—ASSAY IN TERMS OF U S P 1934 REVISION UNITS OF VITAMIN A PER GM

Oil No	Biological Method	Antimony Trichloride Method	% Deviation	Laboratory A	Spectrometric Method % Deviation	Laboratory B	% Deviation
1	85,750	75,600	-11.8	76,440	-10.9		
2	107,450	78,400	-27.0	94,080	-12.4		
3	2,192	2,240	+2.2	2,784	+27.0	3,000	+36.8
4	2,156	2,054	-4.7	2,523	+17.0		
5	3,080	3,156	+2.5	2,850	-7.4	3,760	+21.7
6	2,156	2,279	+5.7	2,497	+15.8		
7	2,478	2,409	-2.8	2,497	+0.8	2,730	+10.2
8	3,780	3,347	-11.5	45,225*	Very large	4,100	+8.5
9	60,900	64,440	+7.3	60,750	-0.2		
10	236,000	226,000	-4.2			249,000	+5.5
11	171,000	156,800	-9.6			110,000	-35.6

* Laboratory A rechecked this figure and found it to be correct

In Table II the results have been grouped according to the extent to which they differ from the biological assay

TABLE II

Deviation from Biological Assay	Antimony Trichloride Method	Spectrometric Method Laboratory A	Laboratory B
± 5%	45.4%	22.2%	
± 5-10%	27.3	11.1	33.3%
± 10-20%	18.2	44.4	16.7
± 20-30%	9.1	11.1	16.7
± 30-40%			33.3
> ± 40%		11.1	

DISCUSSION

With one exception (Sample No. 11) Laboratory "B" has consistently and with wide variation, obtained higher values for Vitamin A potency than is shown by biological assay

Excluding Sample No. 8 (we believe the value given for this oil by Laboratory "A" is erroneous and should probably be 4522.5) Laboratory "A" has obtained on oils of high potency (Samples Nos. 1, 2, 9) Vitamin A values in reasonable agreement with the results of biological assay. Greater variations occur, however, in the oils of low potency (Samples Nos. 3, 4, 5, 6, 7)

Except in the case of Sample No 2 the antimony trichloride test, as used by us, has given Vitamin A values which are in fair agreement with those obtained through biological assay

We gratefully acknowledge the assistance of the Biological Laboratories of E R Squibb and Sons in conducting the biological assays reported herein

ENTERIC COATINGS II EXCRETION STUDIES WITH SODIUM SALICYLATE TABLETS *

BY MILTON WRUBLE

In an earlier paper (1) the use of calcium sulphide-methylene blue tablets was found of value in checking the effectiveness of enteric coatings qualitatively. As a further step in this direction it was thought desirable to make a quantitative evaluation. Since salicylates are excreted more or less quantitatively, are widely used in medicine and in many cases produce irritation in the stomach when unprotected by a suitable coating, they were of particular interest in this connection.

Salicylates are excreted quite rapidly but incompletely in the urine, mainly as such, and to a small extent as salicyluric acid (2) and a number of other products. Stockman (3) states "Salicylic acid and salicylates are conjugated and excreted as salicyluric acid. Persons taking up to 180 grams of sodium salicylate per day eliminate no free salicylic acid." Holmes has found (4) that for doses of sodium salicylate of from 2 to 5 Gm the salicylic-salicyluric ratio is constant at the value of 40/60.

The absorption of salicylates is quite rapid and for this reason exceedingly small amounts are at times found in the feces, more often none at all. With full therapeutic doses of about 15 Gm, Hanzlik, Scott and Thoburn (5) and Hanzlik and Wetzel (6) were able to recover in the urine about 75 to 80 per cent of the total administered. They concluded that about 20 per cent of the salicylate was destroyed in its passage through the body.

The rate and duration of excretion of salicylates varies with the dosage, the individual and the individual's state of health. In general, it has been found by Blanchier (7) that with doses of 1 to 2 Gm, excretion is completed in 22 hours, Ehrmann (8) found that excretion lasted from 36 to 48 hours in normal individuals, Geissler (9) noted that complete elimination takes place in 12 hours. However, Sée (10) states that it ordinarily lasts from 24 to 48 hours.

The quantitative recovery of salicylates from tissues and body fluids involves difficulties and complexities not present in foods and simple aqueous solutions. This can be readily appreciated since in passing through the body the salicyl group is conjugated with glycocholic acid, whose properties differ from salicylic acid. Moreover, the presence of colloidal and other interfering substances prevent a smooth and quantitative recovery of salicylic acid.

A number of quantitative methods for the determination of salicylates in urine have been developed. None appears entirely satisfactory. A critical survey of these methods has been adequately made by Thoburn and Hanzlik (11). Recently Merz (12) and Blume and Breuning (13) have outlined extraction methods for the determination of salicylates in urine.

* The Research Laboratories, The Upjohn Company, Kalamazoo, Michigan

Since most of the proposed methods show decided weaknesses, Thoburn and Hanzlik have adapted a steam distillation method to the determination of salicylates in body fluids. Briefly their method (14) consists of

- 1 Hydrolyzing an aliquot portion of urine which has been collected until the voided specimen, when extracted with ether and tested with ferric alum, is salicyl free
- 2 Distilling with steam until the salicylates are driven over
- 3 Colorimetric estimation of the distillate with ferric alum

Holmes has criticized (15) this method since he claims that the distillation of the salicylates is incomplete because the salicyluric acid is hydrolyzed only very slowly and that at the high temperatures which have to be used the salicyl ring is destroyed to some extent. He modifies the Thoburn-Hanzlik method in several details but his results indicate a lack of consistency.

Several of these methods were investigated by the author and the one finally adopted as most satisfactory was that of Thoburn and Hanzlik with several modifications. Holmes' method invariably yielded low results. The Merz method offered considerable difficulty because of the formation of troublesome emulsions and, as a result, the extraction process was long and tedious.

The Thoburn-Hanzlik method was modified in several details to yield better results. Considerable difficulty was experienced in completely recovering the salicylates from the average urine and with some urines the last traces were removed only after long and vigorous distillation. No doubt some urines are more highly conjugated than others and this accounts for the resistance displayed in the recovery of the salicylates. By keeping the volume of urine as low as possible during distillation, the recovery is considerably hastened. It was found advantageous, therefore, to begin with half the volume of urine recommended, namely, 50 cc.

Enough phosphoric acid is added to the urine to make it distinctly acid and the large excess recommended by Thoburn and Hanzlik avoided. Phosphoric acid proved to be the best hydrolyzing agent because of its high boiling point and also because it is not readily decomposed. However, with a large excess present it is quite possible that some is mechanically carried over into the distillate.

In this connection Thoburn and Hanzlik (16) make the following statement

"The distillate should be perfectly clear, practically colorless and possess a nearly neutral or very slightly acid reaction to litmus paper."

However, Nicholls has shown that the solution should be appreciably acid. He states (17)

"Contrary to the usual statements in the literature, this test should not be applied to a neutral solution of a salicylate, as the color so produced is not of satisfactory shade. To obtain a good tint the solution should be slightly but appreciably acid, the intensity of color from a given quantity of salicylic acid decreasing with increasing acidity."

For the colorimetric comparison in Nessler tubes, salicylic acid rather than sodium salicylate as recommended, was used. It was found almost impossible to match the colors when sodium salicylate was employed as a standard. From what has already preceded it is apparent that the standard should be appreciably acid.

A 1 per cent solution of iron and ammonium sulphate which has been previously boiled and filtered was found to be superior to the 2 per cent solution

recommended by Thoburn and Hanzlik The latter solution is considerably more intense in yellowish green color and with dilute solutions interferes with the colorimetric determination

EXPERIMENTAL

Eight individuals ranging in age from 18 to 25 years were each given three 5 grain tablets of sodium salicylate both uncoated and enteric coated ¹

A complete 48-hour specimen of the urine was collected in each case The urine samples were properly preserved and several determinations made on each sample Distillation was carried out in each case until the ethereal extract of the residue showed no pink coloration with ferric alum

The following table indicates the results obtained

TABLE I

Patient	Total Volume Collected in 48 Hours	Condition of Tablet	Gm Salicylate Recovered
J W A	1750 cc	Coated	0 12 Gm
	1905	Uncoated	0 18
E J V	1100	Coated	0 33
	1570	Uncoated	0 39
E E B	1635	Coated	0 38
	1550	Uncoated	0 24
M F	1875	Coated	0 38
	2675	Uncoated	0 35
K K	1450	Coated	0 14
	1325	Uncoated	0 23
D F	2370	Coated	0 53
	3380	Uncoated	0 36
W W	2225	Coated	0 30
	2210	Uncoated	0 30
S K	3620	Coated	0 28
	3280	Uncoated	0 25

CONCLUSIONS

1 Several modifications of the Thoburn-Hanzlik method for the determination of salicylates in urine have been outlined

2 The results indicate a close agreement between the quantities of salicylate excreted in the coated and uncoated tablets Since no gastric irritation was reported, this is an indication of the effectiveness of the enteric coating

3 The average recovery following the ingestion of 15 grams of salicylate appears to be approximately 30 per cent

REFERENCES

- (1) Wruble M 'Enteric Coatings' *Am J Pharm*, 102 318 (1930)
- (2) Hanzlik, P J "Actions and Uses of the Salicylates and Cinchophen in Medicine," page 35
- (3) *Ibid*, page 36
- (4) Holmes E G 'A Contribution to the Study of the Metabolism of Salicylic Acid' *J Pharm and Exp Therap* 26 313 (1925)

¹ This enteric coating was developed in the Research Laboratories of The Upjohn Company

(5) Hanzlik, P J, Scott, R W, and Thoburn, T W, "The Salicylates V Excretion of Salicyl in the Urines of Rheumatic and Non Rheumatic Individuals," *J Pharm and Exp Therap*, 9, 247 (1917)

(6) Hanzlik, P J, and Wetzel, N C, "The Salicylates XI The Stability and Destruction of the Salicyl Group under Biological Conditions," *Ibid*, 14, 25 (1919)

(7) Hanzlik, P J, "Actions and Uses of the Salicylates and Cinchophen in Medicine," page 36

(8) *Ibid*, page 36 (9) *Ibid*, page 36 (10) *Ibid*, page 36

(11) Thoburn, T W, and Hanzlik, P J, "The Salicylates II Methods for the Quantitative Recovery of Salicyl from Urine and Other Body Fluids," *J Biol Chem*, 23, 163 (1915)

(12) Merz, K W, "Ueber die Perkutane Resorption von Alkalisalicylaten aus Salbenähnlichen Zubereitungen und die Quantitative Bestimmung der Salizylsäure im Harn," *Archiv der Pharm*, 269, 449 (1931)

(13) Blume, W, and Breuning, P, "Vergleichende Untersuchungen ueber den Resorptionsverlauf der Salizylsäure nach intratrachealer und nach Subkutaner Injektion," *Archiv fuer Exp Path u Pharm*, 161, 183 (1931)

(14) Thoburn T W, and Hanzlik, P J, "The Salicylates II Methods for the Quantitative Recovery of Salicyl from Urine and Other Body Fluids," *J Biol Chem*, 23, 174 (1915)

(15) *J Pharm and Exp Therap*, 26, 297 (1925)

(16) *J Biol Chem*, 23, 175 (1915)

(17) Nicholls, J R, "Determination of Small Quantities of Benzoic and Cinnamic Acids with Some Notes on the Colorimetric Determination of Salicylic Acid" *Analyst*, 53, 19 (1928)

(To be continued)

COMPOUND SOLUTION OF CRESOL—THE VARIATION OF PHENOL COEFFICIENT WHEN DIFFERENT OILS ARE USED FOR SAPONACEOUS BASE *¹

P L BURRIN, A G WORTON AND F E BIBBINS¹

The Bureau of Animal Industry of the United States Department of Agriculture has been very active in its supervision of the interstate shipment of domestic animals, and as a part of their duties they have described means for disinfecting cages as well as animals. Since such a procedure is common and within their control, it is only a natural sequence that they should be highly interested in the control of the material used in these prescribed methods of disinfecting. This department deviated from the standards which were laid down by the United States Pharmacopœia for compound solution of cresol as early as 1915 (1). They deemed it necessary, in view of their extensive recommendations for the use of soap solutions of cresol, to lay down requirements in many cases more stringent than those in the United States Pharmacopœia. The economy of manufacture was given due consideration when making these specifications as well as the effectiveness of the final product.

In the interest of improving compound solution of cresol U S P the authors tried several oils which are available for use in the manufacture of such a product. Compound solutions of cresol were prepared, following the directions of the United States Pharmacopœia, tenth revision, using corn oil, peanut oil, sesame oil, cocoanut oil, and soy bean oil (2). In order to have a control sample, a solution was made

* Scientific Section, A PH A, Portland meeting, 1935

¹ From the Control Laboratories, Eli Lilly and Company

from linseed oil Comparison of the resulting finished preparations was then made, particular attention being given to the phenol coefficients

The usual means of comparing the effectiveness of these cresol solutions has been the determination of their phenol coefficient There has been considerable discussion about the actual worth of the phenol coefficient in the evaluation of compound solution of cresol Every one agrees that there can be a variation in this determination due to the age and viability of the organisms used, the media, the test broth, and perhaps in the technique in running the test Whatever may be the opinion as to the value of a phenol coefficient, it does seem that on a comparative basis it has value In the following experiments the phenol coefficients were determined on all samples at the same time with the same cultures Whether the phenol coefficient appears high or low, our only purpose in assigning numerical values is to show the ratio of the phenol coefficients in the experiments performed As previously mentioned, the phenol coefficients were determined by the standard method Although we did not attach a great deal of significance to the phenol coefficient as a true lethal index, we considered it of value in showing the comparative activity of the solutions prepared from the various oils The results of these determinations are shown in the following table It is interesting to note from the table that the sample made from cocoanut oil shows a phenol coefficient 100 per cent greater than the coefficients shown by samples made with other oils, when tested with *B typhosus*, and 50 per cent greater when tested with *Staphylococcus aureus*

It is customary in the manufacture of large quantities of compound solution of cresol to filter the liquid as a final step in order to obtain a brilliant product Consequently, the ease with which the various solutions filtered was considered an advantage in selecting the oils which might be desirable For this purpose the solutions were filtered, and the ease with which they ran through the filter paper is noted in the following table

TABLE OF COMPARISON

Oil Used	Filterability	Phenol Coefficient Using <i>B typhosus</i>	Phenol Coefficient Using <i>Staph aureus</i>	Solidifying Point Degrees Fahrenheit
Corn	Good	1 5	1 0	-20
Peanut	Very poor (gelatinized)	1 0	1 0	Gelatinized
Sesame	Good	1 5	1 0	-15
Cocoanut	Good	3 0	1 5	-15
Soy bean	Good	1 5	1 0	-20
Linseed	Good	1 5	1 0	+ 5

The water content and excess alkali were determined in all samples, and found to be within the usual limits It was at this point we discovered that compound solution of cresol made from sesame oil had a very poor solubility in alcohol

In observing the several experiments it was noted that the samples made from peanut oil became very thick, and turned to a jelly when stored at room temperature When the sample was shaken, it again returned to a liquid condition, but when allowed to stand undisturbed it again gelatinized Since compound solution of cresol may be subjected to rather low temperatures, and since it is very necessary that a dispensable liquid which does not separate at these low temperatures be obtained, it was decided to determine the chill points of all experiments

as outlined in *Bulletin* No 1308 of the Agriculture Department (3) The results of these tests are recorded in the following table

It can be observed readily from the preceding table that there are several oils just as desirable as linseed oil for compound solution of cresol The authors sought to eliminate any comparison of the oils on a price basis, so no experiments were made to ascertain just how low a grade of oil could be used for making the soap of the various products, consequently, all of the oils used were of high grade Corn oil and sesame oil make a satisfactory product, which has a chill point somewhat lower than the product made from linseed oil Coconut oil makes a satisfactory product which shows a phenol coefficient from 50 to 100 per cent higher than the coefficients shown by products made from other oils The price of coconut oil is slightly higher than linseed oil, but it apparently makes a product that is decidedly more efficient

CONCLUSIONS

It may be said that there are several oils, namely, corn, soy bean, coconut and linseed that will make a satisfactory cresol compound Peanut and sesame oils are not desirable for use in such a product It appears from the above experiments that coconut oil is the only one of this group that can be used to manufacture a satisfactory product which at the same time shows an increased phenol coefficient For this reason it may be desirable as a base for compound solution of cresol Finally, it seems that there may be oils more desirable, for the manufacture of these soap cresol solutions, than linseed oil that is now prescribed by the United States Pharmacopœia

REFERENCES

- (1) U S Department of Agriculture, Department *Bulletin* No 1308 1 (1924)
- (2) United States Pharmacopœia Tenth Revision, 210 (1926)
- (3) U S Department of Agriculture, Department *Bulletin* No 1308, 5 (1924)

IMPROVEMENT IN TECHNIQUE IN THE PREPARATION OF THREE COMMON PRODUCTS *

BY EDWARD D DAVY

There are distinct advantages in the modification of some of the commonly accepted formulas both as to the ease of preparation and the appearance of the finished product, and this without altering the value of the product in any way

The three products used to illustrate improvement in technique are Syrup of White Pine Compound, N F, Elixir of Phenobarbital, and Soft Soap, U S P IX

Syrup of White Pine Compound when prepared by the N F formula without change yields a product which, upon aging, results in an oleaginous suspension which, after a few days, forms an oily layer on the surface of the syrup making an unsightly preparation This condition may be corrected by siphoning or otherwise removing the clear liquid after aging The directions for preparing the product do not provide for clarification

The Oil of Sassafras which represents an excess over saturation is the chief offender, though the resin from the Balm of Gilead Buds also contributes to this

* Section on Practical Pharmacy and Dispensing, A Ph A

oleaginous material To correct the excessive oil residue in this syrup, if one adds the oil to the menstruum the excess is retained by the drug, and saturation is all that should be expected The sugar is dissolved in the percolate and the chloroform added as indicated in the formula

Elixir Phenobarbital—While no formula appears in our standard texts this elixir was selected because of the difficulty encountered in filtering the finished product when cudbear is used as the coloring agent In addition the maximum color effect is not obtained when the cudbear is macerated in alcohol as is usually prescribed The alcoholic extract or tincture when added to the preparation results in a product not brilliantly clear and the colloidal material from the previously clear alcoholic solution makes filtration very difficult, being accentuated by the presence of both glycerin and syrup

This filtration difficulty is avoided by macerating the cudbear in alcohol, glycerin and water in approximately the same ratio as is represented in the finished product Filtration is fairly rapid and the depth of color is increased and it remains brilliantly clear The phenobarbital is dissolved in a small amount of alcohol reserved for this purpose and added to the clear filtrate from the cudbear Sugar in amount to the syrup prescribed is then dissolved by agitation

To show the solvent action of glycerin on the coloring from cudbear, one need only to evaporate a portion of the alcohol-glycerin filtrate The glycerin residue remains perfectly clear and may be diluted with water without loss of its brilliancy

Sapo Mollis U S P IX—(Cold process) Since there is a considerable demand for a potash soap as contrasted with the U S P X sodium-potassium mixture, suitable for liquefaction for use in general soap service and in the surgery of hospitals, it was thought advisable to offer a convenient procedure for its preparation, one which has worked successfully in our laboratory for several years

The following procedure makes a good soft soap, or if one chooses he may, by adding distilled water, prepare a liquid soap containing up to 22% anhydrous soap The U S P IX formula with regard to oil, potassium hydroxide and the initial water to be used needs no change

The alkali is dissolved in distilled water (10% of the weight of finished soap or 100 cc for 1000 Gm of soft soap) and immediately add all the oil and stir well For small amounts of soap the saponification will be completed in from three to four hours Stirring the mixture at intervals to emulsify the unsaponified oil is all that is necessary for saponification Occasionally when working with small amounts of soap and always when working with quantities of 500 to 800 pounds or more it is necessary to increase the water content by about 20% as saponification approaches completion Completeness of saponification may be told by dissolving a small amount of the soap concentrate in distilled water, if saponification is complete a clear solution results

One should check the alkalinity or acidity by dissolving a weighed sample of the soap concentrate in alcohol and proceed as usual to adjust the product to any degree of alkalinity, or neutrality if that is desired All additions of either alkali or oil must be made while in the concentrated form

If one desires he may make a solution of the alkali and assay it previous to mixing with the oil—I have found that potassium hydroxide, U S P grade, when properly protected from moisture, may be added in the quantity prescribed and a

soap with only a slight alkalinity results Benzoic Acid may be added to a liquid soap to reduce alkalinity when it is desired to make a neutral or acid-liquid soap

POTENT MEDICAMENTS IN SUGAR-COATED PILLS AND IN CONFECTIONS *

BY JOHN F. SUCHY ¹

The subject of pill-coating and candied medicaments has received much consideration in recent years The coated commercial pill or tablet has become a masterpiece of attractiveness and palatability Disagreeable substances have been skilfully blended into confection form until their gustatory incompatibilities have completely faded away Repellence has given place to attractiveness and one can now look forward to the swallowing of his tonic or cathartic dose, of strychnine, of Nux Vomica or of Atropine with pleasant anticipation Nature's warnings of physiological potency—extreme bitterness or nausea—have become masked Disagreeables have become agreeables—a creditable achievement of modern pharmacy

As is true with so many good things, undesirable factors so frequently manifest themselves, calling for modification or restriction The barbiturates once hailed as hypnotics par excellence have been found to have a destructive action on the white blood cells Emetine though found distinctly amœbicidal, cannot be practically used in tooth-pastes in sufficient quantities to effect pyorrheal cures So it has also proved true of our sugar coatings and confections Frequent newspaper head-lines call attention to poisonings of children due to accidental ingestion of pills or other medicaments containing highly potent substances More intimate experiences of members of this group will undoubtedly recall instances when these individuals themselves, their children or child-friends have eaten such pills or licked off their alluring coatings The interest of the author in this study began only last fall and even since then articles regarding two pertinent incidents have appeared in the local press of Western Montana, an area occupied by less than 250,000 inhabitants The first—a case in Orchard Homes, a community adjacent to the city of Missoula, wherein a 2½ year-old girl swallowed eighteen aspirin gum tablets with the result that her subsequent condition was for some time considered as critical The second incident occurred only about two months ago in Great Falls where two youngsters showed symptoms of poisoning, presumably due to the eating of pills containing belladonna—one of these cases resulted in a fatality

About two years ago a rather pitiful case was reported from Butte where an uncle from one of the eastern states had just arrived for a visit with his Montana relatives and accidentally or perhaps thoughtlessly left a package of Hinkle's Pills on the dresser of his room Somewhat later during his absence his little niece spied the alluring pellets, tasted them, found them good and ate several with the sad sequel that shortly afterwards she died in convulsions

In a fine address (1) delivered in 1930 and later published in the *Journal of the American Medical Association*, President Aikman of the Pediatrics Society of

* Section on Practical Pharmacy and Dispensing, A Ph A, Portland meeting 1935

¹ Associate Professor of Pharmacy, University of Montana, Missoula, Mont

Rochester presents statistical data taken from New York Health Reports which show that in that state alone during a period of four years, there occurred 177 deaths traceable to accidental poisonings. Eighty children of five years of age or under were included among the victims. Forty of these deaths were due to the eating of pills or tablets containing strychnine. This list does not include cases which resulted in recovery nor does it include many of those which proved fatal before the arrival of a physician or where his period of supervision was of too short duration to warrant proper conclusions. A report compiled by the Metropolitan Life Insurance Company (2) lists 273 deaths of children under five years of age insured in the Industrial Department of this company as due to accidental poisoning. Definite information of the type of poison consumed was reported in 242 of the cases. Strychnine was held responsible for 82 of these deaths or approximately one-third of those in which the nature of the poisonous substance was known. Forty-six of these deaths were found to have been due to the eating of strychnine pills or tablets. Quoting from the bulletin itself—

‘Children, and especially young children, are the most frequent victims of accidental poisoning. Strychnine takes a heavier toll of child life than does any other poison.—More than half of the young children who die from strychnine poisoning are victims of pills or tablets containing this substance.’

It has been reported that more deaths occur in the State of New York among children of less than five years of age because of accidental consumption of strychnine pills than are caused by both rabies and tetanus.

While it is true that the relative percentage of fatalities is likely to be lower in Western Montana owing to less congestion of population and a consequent lesser chance of youngsters picking up poisoned medicaments in rubbish heaps, abandoned houses, etc., yet even in this area the hazards involved merit consideration. Surely there is need of a greater care in the dispensing and handling of dangerously potent pills and confections. The American Medical Association and other scientific groups have seriously considered the subject. It has been suggested that pills and tablets containing poisons be left uncoated which argument does not seem unreasonable. Perhaps it would be even well to coat these deadly buckshot with aloes or quinine or some other similar bitter substance. It has also been suggested that caution labels with appropriate antidotal directions be applied to containers in which these substances are dispensed. This remedy likewise seems worth while for cautionary specifications on the label would tend to localize the sale of these remedies to the *bona fide* drug store, thus stressing the professional status of pharmacy with the laity. The true nature of even such old remedies as Hinkle's Pills makes the drug store the proper and logical place for their sale. To purchase strychnine one must invariably sign the poison register but to buy it in candied form one needs only to write to some mail order house or in many states to go to the grocery or department store. Besides, what youngster would want to eat the unblended alkaloid anyway?

It has been suggested that the omission of strychnine from laxative pills would markedly lessen the number of accidental poisonings. Several authorities, including Dr. Fantus (3), express a certain skepticism as to the therapeutic utility of the alkaloid in such preparations. In their splendid article published in one of last

December's issues of the *Journal of the American Medical Society*, Drs Yonkman and Singh (4) report results of five experiments performed on four persons, all of which seem to indicate that strychnine has little if any peristaltic effect even if administered in amounts two or three times as large as is contained in the usual cathartic pill. Both of these workers strongly advocate the discontinuation of the alkaloid for purposes of promotion or augmentation of catharsis.

We are ever ready with our protests when the dog poisoner plies his business of canine destruction, and throws out his toxic bait. "This is criminal," we say, because of the hazard to children—yet who worries when the careless tenant, too frequently uninformed of the possible dangers, moves out of a dwelling and leaves behind him veritable traps of candied poisons. The problem of candied or sugar-coated medicaments does merit consideration of this organization.

REFERENCES

- (1) Aikman, John, *J A M A*, 95, 1661-1665 (1930)
- (2) *Statistical Bulletin*, Metropolitan Life Insurance Co., 11, No. 2 (1930)
- (3) Fantus, Bernard, "Useful Cathartics," Chicago American Medical Association, page 133 (1927)
- (4) Yonkman, F F, and Singh, H, *J A M A*, 103, 1931-1933 (1934)

NATIONAL UNITY OF STATE COOPERATION BETWEEN PHARMACIST, PHYSICIAN AND DENTIST *

BY GEORGE C. SCHICKS ¹

Much has been written to date concerning the closer cooperation between the allied medical professions. The thinking pharmacist has come to realize that if prescriptions employing official drugs and preparations are to be written for, that authentic information regarding United States Pharmacopœia and National Formulary preparations must be effectively and repeatedly presented to those groups of men who are licensed by law to prescribe medication. It is encouraging to note that progressive individual pharmacists have devised effective means of meeting the situation of closer cooperation with the medical men whom they serve. It is equally stimulating to watch the progress of various county pharmaceutical associations and the contacts they have made with county medical and dental groups. New Jersey county pharmaceutical groups have been especially active in their efforts to encourage inter-professional relationship, and because New Jersey has gone a step further and organized a state-wide movement to foster closer contacts between pharmacist, physician and dentist, I am asking your permission to outline briefly the work that this state is undertaking in its effort to increase the professional usefulness of its practicing pharmacists.

"In the New Jersey Pharmaceutical Association, there is a Professional Relations' Committee with duties obvious from the name of the committee. This committee, through the cooperation of the state medical and pharmaceutical associations, has created the Joint Committee on Professional Relations of the

* Section on Legislation and Education, A. P. H. A., Portland meeting, 1935

¹ Assistant Dean, Rutgers University, College of Pharmacy

New Jersey Medical Society and the New Jersey Pharmaceutical Association The physicians on the Joint Committee are the members of the Medical Practice Committee for the State Medical Society The pharmacists on the Joint Committee are appointed by the State Pharmaceutical Association These groups working through their respective associations have authorized the publication of a New Jersey Formulary This publication does not conflict with the official publications—the United States Pharmacopœia or National Formulary, for none of the preparations in the New Jersey Formulary are official If and when they are accepted by either of the official publications, the preparations will be dropped from the New Jersey Formulary To date there are eleven formulas which have been accepted for the New Jersey Formulary The formulas represent popular combinations of drugs which are popularly sold and which can be made by the pharmacist

"Each month the *Journal* of the New Jersey Medical Society contains an article concerning these preparations or others official in the United States Pharmacopœia or National Formulary The same article is printed in the *New Jersey Journal of Pharmacy* In this way both professions are made aware of what is being recommended and prescribed employing official drugs and preparations When enough formulas have appeared in the *Medical Journal* to warrant their compilation into a printed New Jersey Formulary, the Medical Association will supply its own members with the "New Jersey Formulary" In the interim the State Pharmaceutical Association has had printed in loose-leaf form, the formulas published to date, which leaves are available at small cost to pharmacists for distribution among the physicians they serve

"Inasmuch as physicians treating Federal Emergency Relief Administration patients are required to prescribe official drugs and preparations, the F E R A has approved the use of the 'New Jersey Formulary' preparations This approval has given the 'New Jersey Formulary' most favorable publicity among physicians of the state

"This summer at the meeting of the State Medical Society the Pharmaceutical Association was asked to make a display of 'New Jersey Formulary' preparations in the Scientific Section, so that the medical men could see the preparations and have them discussed if they so desired At the same meeting a very comprehensive report of the work of the Joint Committee was made by one of the medical men on the committee to his fellow association members The pharmacy members of the Joint Committee were the guests of the Medical Association at the above-mentioned meeting Next year the Medical Practice Committee or the medical men on the Joint Committee will be guests of the New Jersey Pharmaceutical Association

"At a luncheon meeting of the Joint Committee, a motion was presented by one of the medical men, and passed, which provided that during the coming year qualified speakers be invited by the Medical Association to appear at the various county medical organization meetings, to instruct physicians on the 'New Jersey Formulary,' United States Pharmacopœia and National Formulary drugs and preparations At such meetings pharmacy speakers will be given the opportunity not only of discussing prescription writing and the use of official drugs and preparations, but they will be afforded an excellent opportunity to discuss the economic aspect of such prescribing

"Here, for example, are a few comparative costs to be considered when employing 'New Jersey Formulary' formulas as compared with the proprietary articles

N J F Preparations	Amount	Proprietary Cost	N J F Cost
Elixir Phenobarbital	1000 cc	\$ 5 00	\$ 0 75
Syrup Potass Guaiacol Sulphonate	1000 cc	4 25	0 95
Pulvis Bismuth Subcarb Comp	100 Gm	0 55	0 17
Nebula Ephedrine	1000 cc	26 40	2 06
Nebula Ephedrine Comp	1000 cc	26 40	2 14
Elixir Amidopyrine	1000 cc	6 00	1 43
Pulvis Alkalinus Effervescens	100 Gm	0 50	0 17
Pulvis Bismuth Subnitrat Comp	100 Gm	0 47	0 39
Pulv Bismuth Subnitrat Comp cum Carb Lig	100 Gm	0 47	0 40
Liq Ephedrin Sulph	1000 cc	28 00	2 26
Liq Ephedrin et Epineph	1000 cc	28 00	3 79
		<hr/>	<hr/>
		\$126 04	\$14 51

"It costs the pharmacist \$14 51 to manufacture all eleven formulas in the quantities stated in the 'New Jersey Formulary' To buy them under proprietary name costs \$126 04 A saving of \$111 53 I shall leave it to you as to whether or not this sum is worth saving

"Allied professional cooperation has not confined itself to state medical and pharmaceutical units, for recently has come a request to Rutgers University College of Pharmacy from the chief of the staff of one of the largest hospitals in New Jersey that a course in prescription writing and the use of official drugs and preparations be given physicians and internes of that hospital When such a course is satisfactorily arranged the chief of staff physician will make it mandatory that the physicians on his staff take the course From one such hospital fifty to seventy-five medical men would be required to take such instruction With the request for such a course comes the information that it would not be necessary to make such instruction obligatory, for the physicians of that hospital are eager to get the information

"With this rather hurried résumé of professional cooperative trends in New Jersey, permit me to suggest again as I did in our meeting last year, that this co-operative trend is of far too great moment to be consigned to individual pharmacists, local and county pharmaceutical groups or state pharmaceutical associations Should not a movement upon which rests the very security of professional pharmacy, be vital enough to every pharmacist who is interested primarily in the professional aspect of his service, that it be made a movement of national scope? Should not such a movement warrant a national program to unite the pharmacists throughout the country, in a supreme effort to build the same professionalism which is the present heritage of both the medical and dental professions?

"I am aware that many local and county pharmaceutical associations scattered throughout this country are doing effective work among physicians and dentists Other groups have failed because they lacked a definite method of attack and a sane program to be followed to a satisfactory conclusion

"Pharmacy to-day should have a body created within the AMERICAN PHARMACEUTICAL ASSOCIATION, manned by capable and experienced men, with re-

search laboratories which will provide men in the profession with information regarding new drugs, chemicals and preparations appearing in constant flow on the market Pharmacy should have a body created within the AMERICAN PHARMACEUTICAL ASSOCIATION which could compile information regarding the activities of local and state pharmaceutical organizations and from the successful activities of such groups develop a national program to foster closer cooperation between the allied medical professions

"In justification of my argument for the creation of a national bureau for pharmaceutical information, I am making mention of a similar service in both the medical and dental professions Scientific information as well as association proceedings are disseminated from the national headquarters and laboratories maintained by the American Medical Association and the American Dental Association All new phases of the practice of each group, new medicaments, economic problems, activities of county and state organizations, when their work merits being the pattern for other county and state groups—all of this information goes out to the physician from the headquarters and the Council on Pharmacy and Chemistry of the American Medical Association, all of this information goes out to the dentist from the headquarters and the Council on Dental Therapeutics of the American Dental Association Why then should not a similar informative organization be provided by the AMERICAN PHARMACEUTICAL ASSOCIATION? The AMERICAN PHARMACEUTICAL ASSOCIATION has a record behind it of accomplishments of which it can well be proud It has always stood for the highest ideals in pharmacy and its contributions to the pharmacists of this country have been exceedingly noteworthy I could conceive of no more appropriate information bureau and investigation laboratory for the AMERICAN PHARMACEUTICAL ASSOCIATION than the new Pharmacy Headquarters Building in Washington, D C From there all of the worth-while pharmaceutical information could find its way to the members of the AMERICAN PHARMACEUTICAL ASSOCIATION There the constructive professional cooperation activities of individuals and organizations could be reviewed and from there could be broadcast a program which is a live, workable project, with thoroughly outlined ideas, scientific displays, scientific information for pharmaceutical speakers and a speaker's bureau for definite pharmaceutical districts or zones The work among physicians, dentists, veterinarians, chiroprodists and medical opticians could then follow a well-planned, definite and effective program

"So that this important phase of pharmaceutical service can be placed before the AMERICAN PHARMACEUTICAL ASSOCIATION for their consideration the following recommendation is made

"I recommend that the Section on Education and Legislation¹ go on record as requesting the AMERICAN PHARMACEUTICAL ASSOCIATION to create a body or bodies with the necessary working facilities to give the pharmacists in this country up-to-date information on such pharmaceutical and medical material as new drugs, preparations, formulas, standards, plans for detailing doctors and dentists, also other medical groups, and other information which will prove helpful and be instrumental in increasing the cooperation and service of the pharmacist to the allied medical professions This information is to appear periodically throughout each

¹ See page 711 JOUR A PH A, for August 1935

year and some method be devised so that all pharmacists may be privileged to take advantage of such a pharmaceutical service "

DENTISTRY AND PHARMACY *

BY P T MEANEY, D M D

"On behalf of the dentists of the Northwest, and particularly the dentists of Oregon, I wish to thank the AMERICAN PHARMACEUTICAL ASSOCIATION for this opportunity of appearing before the assembled delegates "

In the history of civilization a century is but a brief span In the history of pharmacy and medicine five score years seem longer, but they are still a very small portion of the life of a profession In the history of American dentistry that period includes by far the more important part of its development Much of the early history of pharmacy, medicine and dentistry is more or less involved in obscurity, and this is particularly true of pharmacy and medicine They are not to be discredited on this account because history is, for the most part, a succession of fables which the people agree to follow They take what is given to them by historians, who, in turn, use what they can of the records which are available History must always be read with an open mind Science, as we know it, is essentially modern, although its foundation was laid in remote antiquity We find that in early periods all knowledge was more or less confused, and there was no differentiation between professions which are widely separated to-day

It has been said that the tripod upon which every profession rests, if it becomes finally established, must be The school for the instruction of the future graduates, the scientific society for fraternal intercourse and the presentation of knowledge, old and new, and the journal, to disseminate knowledge and to stimulate a wider education and a more general improvement by reaching a larger public In short, literature, education and organization are the foundations of any lasting profession One cannot say which is the most important, but one can safely assert that organization is a great consolidating influence

A man cannot become educated in a profession until there is a recorded history of that profession There must be available a carefully digested store of ideas, experiences and conclusions of the past, for it is upon the past that the present is founded Education is what raises a craft to the dignity of a profession A craftsman needs only to be trained A professional man must be not only trained, but he must also be educated This education can best be acquired from the literature of the profession

Historically, the profession of pharmacy antedates the other health service professions

With a history dating back four thousand years, broken only by periods of desperation for improvement, the professions of pharmacy and medicine, which were closely allied during most of their early history, have struggled through the ages to become at present two of our outstanding professions In the early Assyrian,

* An address given at the Eighty-Third Annual Meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION, Portland, Oregon

Egyptian and Chinese civilizations, we find some very interesting incidents relating to the professions of pharmacy and medicine. There is less known of the pharmacy of ancient China than there is of any other civilization, due, probably, to the fact that the Chinese have always been reticent and secretive to an unusual degree, and because there has been less research in the ancient literature of this living nation than in the literature of many other nations that have disappeared. There is a pharmacopœa-like compilation in Chinese called the Great Herbal. It consists of forty volumes and contains quotations from the works of nearly one thousand authors, many of whom date from a period long prior to the Christian era. The science of medicine, which includes pharmacy, is referred to as a benevolent art. Proof that there were no dentists in China during these periods, and if there were they were regarded with great favor, is indicated by a reference to the following early history.

There were many medical divinities in the religions of China. Of the seventy-two Buddhas, twenty-nine are gods of healing or of drugs. In Taoism, which is a philosophy of abstract virtue, a great part is played by the Yin Yang symbol, or Great Monad, which is a protective charm against evil. Taoism abounds with charms, lucky days and perfect numbers. Rewards and punishments are abundant. Of one hundred fifty separate and particular hells, one is reserved for pharmacists and one for physicians, but there is no mention of dentists. The thirteenth hell is where the victims are perpetually forced to swallow hot, disagreeable medical decoctions.

The profession of pharmacy has been responsible for the development and perfection of many of the basic sciences, chemistry being one of the most outstanding. This profession acts as an intermediary between the other health service professions and the public, therefore, indirectly, you become responsible to a large degree for the health of the great mass of humanity, a responsibility which no other health service profession can boast. Your profession has contributed to all other health service professions without having lost its identity.

From the time of Hippocrates, four hundred years before the Christian era, until the 15th century, all information on dental disease was a small part of medical literature. In 1728 Pierre Fauchard, in his book entitled "Surgeon Dentists," assembled the best of all that was known in dentistry up to that time. Shortly after the 18th century there began to appear in France small volumes written by surgeon-dentists and designed for the laity. Other writers in Europe continued to write upon dental topics and in the American colonies, in the 17th and 18th centuries, the only books on dentistry were the medical books. The main influence on dentistry came from Great Britain during this period. The five important British authors were Berdmore, Hunter, Blake, Fox and Murphy. The reading of these books from Europe stimulated writings in America. In the 19th century several American books appeared by American authors, Doctors Skinner, Flagg and others. The culmination of dental learning at that time was a book by Samuel S. Fitches, published in New York in 1829, written in six different languages. It was a digest of everything ever written on Surgeon Dentistry. It gave a soul to this branch of surgery, which had previously been lacking, and gave to the American dentists a concreteness which they had never had before. Other books written about this time established the preeminence of American dental literature.

Most writers on American dentistry start their history in the first decade of the 19th century. It is true that until 1840, in the United States, medicine and dentistry were essentially one.

The period beginning in 1830, and ending with the panic of 1837, was a period of speculation, mutation and popular unrest. There were acute disturbances within the medical profession itself, which, together with the general unrest, were to have a pertinent relation to autonomous dentistry.

Elisha Perkins' patented treatment of ills by galvanic current, generated by "metallic tractors," had been the vogue in the early years of this century. After the novelty wore off, another cult arose which taught that all medicines not of plain origin were poisonous. The members of this cult adopted the name of "Botanico," or Thomsonians, and received patents on their medicines. Requiring no training, experience or education, but only a sum of money for a book of instruction and a supply of medicine, the cult became popular, grew and prospered. To the annoyance caused by these and other cults was added the problem of medical sects.

Homeopathy, founded by Samuel Christian Hahnemann, was based upon the theory of drug potentiality and was a protest against nauseous doses in vogue with the regular school of medicine. Although there were no institutions in which homeopathy was taught, it made rapid progress because the public was in a restless mood toward medicine, owing to its recent attacks on the cults.

The Botanic-Electis, another powerful sect, was a protest against polypharmacy. They taught the doctrines of specific—the use of a single drug for each disease.

Without precedent, the new dental school founded in Baltimore in 1840 was necessarily modeled after existent medical schools. There was no requirement of preliminary education, and in order to attract medical school graduates, the full course was fixed at a single term of sixteen weeks. There were no clinical facilities, and the faculty, consisting of two physicians and two dentists, merely gave a series of didactic expository lectures, after which the student received the degree of doctor of dental surgery.

Five years later, in 1845, the Ohio College of Dental Surgery was established in Cincinnati. Patterned after the Baltimore School, but with some new features, it became the Western influence in dental education.

The one-session course was soon abandoned for two sixteen-week terms. This made the dental course the same length as the course in most medical schools. Unlike medical training, there was no requirement that the student continue work under a preceptor. The paucity of competent dental surgeons to serve as preceptors forced the dental schools to put clinical instruction into the school curriculum. At this time clinical instruction was not yet part of the medical training. There was little work done under preceptors until 1867, when the Harvard Dental School inaugurated a requirement of sixteen months under a preceptor, in addition to the school course, before the degree was conferred. The current dental journals hailed this as a great advance in dental education.

Another unfortunate occurrence was the application of the term "mechanical dentistry" to that part of dentistry connected with making dentures, as distinguished from the phase of operating on the living teeth of the mouth. Thus, the opponents of dentistry called mechanical dentists "mechanics" and classed them with

the various types of craftsmen, especially after they began to patent their inventions

The medical profession considered patented instruments and appliances of the same ilk as patent medicines, and so this became still another factor in estranging the professions

In an attempt to obviate the difficulty which prevented any of the societies from becoming national in character, Elisha Townsend organized the first American Dental Convention in 1855. These national conventions, like their medical counterparts, proved unsatisfactory because of lack of continuity. There being no continuing of officers, the conventions were a series of annual assemblies rather than meetings of an organization, at intervals of a year. There was no uniformity of policy or method, and no such affiliation as one would expect in an organization of persons of the same profession, with ostensibly the same aims, ideals and purposes.

The organization of the National Dental Association in 1897, and its reorganization in 1913 to become the American Dental Association, has continuously expanded its activities, until they now include a large number which extend into every field of the art and science of dentistry, and may be grouped into a dozen or more categories.

The practice of dentistry has not attained perfection. There is no dead level of perfection, and it is well that this is so, for the constant urge of progress is always an abiding stimulus to advancement. Important discoveries and improvements show that the evolution of dentistry has not been halted. As a health service, dentistry has never been more useful or widely appreciated. As a profession, it has never more earnestly and successfully striven to increase steadily in effectiveness.

Dentistry is a natural division of health service, it is a natural division of medicine.

For more than one hundred years dentistry, as a profession, has steadily improved. In the immediate past, the use of medical sciences in dentistry has made dental practice more scientific and effective. The use of medical sciences in dentistry, where they might be just as appropriately and effectively labeled "dental sciences," makes dental practice more scientific, and therefore more efficient. Medicine, in its most comprehensive meaning, includes the sciences and arts of health service in all aspects and in all relationships. In this generic sense, medicine includes not only conventional medical practice, but also dentistry, public education for the protection of health and for the prevention of disease, nursing, pharmacy and public health administration. All of these services are related to the human body and the maintenance, restoration or support of its function.

Recent graduates of a number of dental schools are receiving much more practical pharmacy in the dental curriculum. Dean Mickelsen, of the Pharmacy Department of North Pacific College, was one of the first to inject practical pharmacy training into the dental curriculum of that institution, and, in fact, he was the first to establish this training on the West Coast. Assistant Dean Schicks, of the Department of Pharmacy of Rutgers University, Newark, New Jersey, was responsible for similar training on the East Coast, and there are several other dental schools in the United States that are now providing this training.

I am sure that you are mindful of the contribution which dentistry has supplied both medicine and pharmacy

In 1844, Dr Horace Wells, a dentist of Hartford, Connecticut, discovered the use of nitrous oxide, or "laughing gas," as it was first popularly called. The use of ether was discovered by Dr T G Morton, a dentist of Boston, Massachusetts, in 1846. The first operations performed under these anæsthetics were for the extraction of teeth.

The dental profession has been instrumental in doing a great deal of research regarding diets in relation to dental caries, the research of which has brought a demand for large amounts of phosphorus-calcium combinations, also cod liver oil.

The American Dental Association has a council similar to that of the American Medical Association, which was organized to determine the worth of various drugs and preparations used in dentistry. It is organized so that men in the dental profession can take guess work out of their medicaments and dentifrices. A council determines the therapeutic and scientific usefulness of products manufactured for dental use. In this way, the American Dental Association is attempting to rid its ranks of unscrupulous manufacturers who have no regard for either science or truth. It is refusing to rent floor space at dental conventions to manufacturers of questionable products, its leading dental journals are refusing to sell advertising space in the journals to manufacturers whose products are fraudulent or worthless. In line with its campaign to inform its members of worthless products through the reports of its council, it has laid down rigid rules covering the admission of proprietary articles to the list of accepted non-official dental remedies.

Of course, a manufacturer may have a product which is useful and represents it truthfully, and may not have applied to the council for approval. Under such conditions, ask for information regarding the product from the Council on Dental Therapeutics. It would have much more professional significance if a pharmacist inquired of the council regarding the merits of a product offered for sale by the manufacturer, than to have a dentist write to the council asking for information about a product a pharmacist tried to sell him.

The council on Dental Therapeutics asks only that a product have some scientific or therapeutic reason for existence. The American Dental Association published a list of Accepted or Non-Accepted drugs and preparations. The reports of the council of Dental Therapeutics should be a source of information for the pharmacist. It is only through cooperation of the health service professions that a complete service may be rendered to the public.

A national organization of the proportions of the AMERICAN PHARMACEUTICAL ASSOCIATION has unlimited power in educational progress, in unification of licensing procedure, in improvement of the literature and encouragement of research, in classification of laws, and in all those tendencies and forces that converge to develop a unified profession that can best serve public welfare.

LIQUOR AROMATICUS ALKALINUS, N F VI		Methyl Salicylate	0 5 cc
		Tincture of Cudbear	20 0 cc
		Alcohol	50 0 cc
ALKALINE AROMATIC SOLUTION		Water a sufficient quantity,	
Potassium Bicarbonate	20 0 Gm		
Sodium Borate	20 0 Gm	To make	1000 00 cc
Thymol	0 5 Gm	A standard mouth wash formula of an alkaline character	
Eucalyptol	1 0 cc		

FORESIGHT IN PROFESSIONAL PHARMACY *

BY ERNST T STUHR ¹

INTRODUCTION

It is unfortunate that pharmacy as a profession has been overshadowed by too much emphasis on the commercial aspects. This encroachment has submerged the dignity of pharmacy and has brought ridicule from allied professions. The problems of a profession concern every member of the profession. It is imperative that all pharmaceutical organizations take heed of this condition and take steps to remedy the situation.

The reputation and prestige of pharmacy among the respected professions is at stake and it depends materially on the training the future pharmacist receives whether pharmacy can cope with present-day demands. This training entails a broad foundation of general knowledge as well as intensified specialization coupled with an abundance of practical apprenticeship in an ethical pharmacy. This apprenticeship should be the culmination of a constructive, cooperative, not competitive, program, between institutions and practicing pharmacists.

Professional experience obtained in the prescription department of an ethical pharmacy has no substitute. Schools and colleges which do not, or cannot, establish a coordinating relationship with health service dispensaries are handicapped in perfecting this vital experience which is an essential prerequisite for the educated pharmacist.

PROFESSIONAL RELATIONSHIP OF THE PHARMACIST TO THE MEDICAL SCIENCES

Efficient medical service is the key-note pursued actively by the medical profession. Professional pharmacy constitutes an integral part in the efficient functioning of medicine and, as such, has a very definite and responsible duty to perform in the Nation's health program. In order to fulfil these obligations effectively, a pharmacist should endeavor to excel in both the theory and practice of his profession.

Functions of the Pharmacist—As the custodian of medicines, the functions of the pharmacist are many-fold.

1 The dispensing pharmacist has the responsibility of preparing, compounding and dispensing with efficiency and dispatch.

2 He must assure purity and quality of the products used. This involves a comprehensive knowledge of the medicinal substances prescribed.

3 He must be thoroughly familiar with all modern remedies and their therapeutical virtues which require a knowledge of synthetic chemicals, biological products and a fundamental acquaintance with scientific research.

4 He must be acquainted with proper methods of standardizing as well as with specific means of storage to retain stability. This is necessary because many of the products are complex and delicate compounds which require special care.

5 He is the final distributor of medicinal products for the sick. This requires strict professional integrity, and is a duty which cannot be undertaken lightly.

* Section on Practical Pharmacy and Dispensing. A. Ph. A., Portland, Oregon meeting 1935.

¹ School of Pharmacy, Oregon State College, Corvallis.

An adequate knowledge of, and ability in, the above, will help a practicing pharmacist to be of invaluable service to the physician and to the community in which he is practicing. The care with which he attends to these details will do a great deal toward elevating the respect of pharmacy as a profession.

The Hospital Pharmacist—The duties of the hospital pharmacist are two-fold

1. Functioning as a competent pharmacist
2. Acting as a scientific "information bureau" to the hospital medical staff and nurses

It is a vital necessity for every large hospital (in order to insure proper control of medical supplies) to maintain an adequate dispensary supervised by a competent pharmacist. Because of his fundamental training and practical experience, the hospital pharmacist should possess a background of knowledge which will enable him, or her, to contact the medical staff with professional confidence. This qualification can be attained by keeping abreast of the latest scientific developments in the fields of medicine and pharmacy. This is a paramount issue for the dispensing pharmacist. Reading is a potent factor.

PHARMACEUTICAL EDUCATION

The proper prescription for training future pharmacists includes a study and recognition of the increasing needs and demands of the public as well as keeping abreast of current pharmaceutical and medical advances. Intensified efforts to constructively develop the mental abilities and capacities of selected students in the direction of professional ideals is a paramount duty of our institutions, thus informing and developing the profession of pharmacy as to growing responsibilities. The social and educational problems must go forward hand in hand.

Proper training of the pharmacist in compounding and dispensing involves not only adequate instruction in fundamentals which are available in recognized institutions, but also practical experience (apprenticeship) in ethical prescription stores, hospitals or public dispensaries.

These latter facilities, however, are not always available should the college or school be remotely located from populated regions of the country. In those institutions which do not have access to the proper channels for practical experience, special courses may be developed to supplement the natural environments to obtain this fundamental professional experience.

A number of schools maintain "model drug stores" for instructional purposes, primarily for the development of the commercial phases of the drug business. These stores have become invaluable adjuncts for the inexperienced student. In addition to giving the student commercial training, these "model drug stores" could also be used for training in the professional side of pharmacy. The prescription department of these stores could be used as a true basis for professional training in prescription compounding. It need not be operative from a dispensing viewpoint in order to be useful, hence would not be competitive. This department should be stocked with medicinal products currently prescribed by the practicing physicians. The students could make a survey of local operating drug stores and make a study of current prescriptions with the objective in view of keeping a proper stock in the prescription department of the "model drug store." This phase of the store could then be correlated with the respective courses in operative pharmacy where the

student has an opportunity to prepare and study the various classes and types of preparations commonly prescribed by the medical profession

The use of the "model drug store" for practice in both commercial and professional pharmacy would be valuable preparation for a student's apprenticeship in an actual situation and would be a means of showing the student the true relationship between commercial and professional pharmacy. The method suggested would also give the student an opportunity to get first-hand information on drugs which are in constant use and which are used only rarely, this would be valuable from a practical standpoint.

It is imperative that the schools give a standard of instruction that will prepare the future pharmacist to be resourceful and competent to meet the demands of the medical profession and the advances of research. Without this objective professional pharmacy cannot long endure. This means a better understanding and recognition of the present-day needs.

The elevation of the standards of pharmaceutical education in the United States during the past twenty years has been phenomenal. Practically the entire effort has been concentrated on undergraduate pharmaceutical training, the quality of which now compares favorably with that of any country.

In the majority of communities the ratio of pharmacists to the population is too high. The rate of increase in the profession continues greater than the rate of increase in the population. The great need of the country is for better, not more, pharmacists, and for opportunities by which those in practice and those who are qualified can prepare themselves adequately for their responsibilities to the public.

AMERICAN PHARMACEUTICAL ASSOCIATION AT THE TEXAS CENTENNIAL EXPOSITION DALLAS

A recent issue of the Dallas Chamber of Commerce states that six national conventions will send more than 1000 members of the pharmaceutical profession to Dallas during the TEXAS CENTENNIAL EXPOSITION, which opens June 6th.

Of especial interest to the profession will be the medical and health display in the United States Building. This exhibit will be placed by the Federal Government at a cost of some \$40,000.00. Elaborate displays of private corporations showing the latest in pharmaceutical equipment, supplies and methods, will be found in the Hall of Varied Industries on the CENTENNIAL grounds. In addition there will be interesting exhibits of other kinds throughout the grounds.

Meeting simultaneously during the month of August, the half dozen parleys will draw members from all parts of the country. Nationally prominent speakers will take an active part in the business meetings.

Dallas pharmacists are planning many special events and amusements for visitors and their families. These include sporting and social events, as well as visits to the EXPOSITION itself.

Meetings scheduled are those of the National Conference of Pharmaceutical Association Secretaries, National Conference of Pharmaceutical Research, American Association of Colleges of Pharmacy, National Conference of Pharmaceutical Law Enforcement Officers, National Association of State Boards of Pharmacy, Plant Science Seminar and the AMERICAN PHARMACEUTICAL ASSOCIATION.

Definite dates for the sessions will be announced later.

THE DEPARTMENT OF THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY

C B JORDAN—CHAIRMAN OF EXECUTIVE COMMITTEE, A A C P, EDITOR OF THIS
DEPARTMENT

I have been asked to write an editorial for the following paper by Professor Fiero Whether you are a teacher of pharmacognosy or of some other course in a school of pharmacy, these papers deserve your attention

Professor Fiero's paper is on a subject of vital importance from more than one angle What is taught in any course will determine the interest (or disgust) aroused in the student, it may affect his rating with the state board examiners and it will affect his ability to succeed in related courses

Some of the results obtained from the questionnaire are surprising and it is regrettable that the author of this paper has not criticised them more severely There is bound to be a variation in our teaching but what a student in New York needs is not much different from what his cousin in Chicago or Los Angeles needs A student going to a second school for graduate work may experience a handicap by such variations in the content of our courses —C J ZUFALL

THE CONTENT OF A PHARMACOGNOSY COURSE

GEORGE W FIERO *

In the syllabi of a pharmacognosy course and various textbooks on the subject, one finds a vast amount of material under this general classification Of course, if one considers the original meaning of *pharmacognosy* (from the Greek *pharmakon* and *gnosis*—a knowledge of drugs), the amount of information which could be included is limited only by our present knowledge of pharmacy, pharmacology, phytochemistry, botany and allied sciences

The question which confronts the instructor is "How much of this information should the prospective pharmacist know?" The course is largely factual Educational authorities tell us that factual information is not long retained after the course is completed There are at least 26 points concerning each of over 300 drugs Should the student be required to commit all of this information to memory?

It would appear that the scope of the course might vary with the drug For example, an important drug such as opium or cinchona should be treated differently from some of the unimportant drugs Some instructors, however, treat them all alike The New York State Syllabus divides the drugs into primary and secondary lists Unfortunately, the amount of material to be taught concerning each of the drugs in the secondary group is too comprehensive Some of the district meetings of boards and colleges have prepared a list of drugs upon which the graduate will be examined It appears to the writer that it is far more important for the student to be entirely familiar with the important drugs at the expense of the unimportant ones

In order to ascertain what pharmacognosy professors think of the relative value of the several points of information, a questionnaire was sent to them Fifty-four replies were obtained, the results of the questionnaire may be seen in the accompanying table

* University of Buffalo School of Pharmacy

SURVEY OF CONTENT OF PHARMACOGNOSY COURSES—1935

	Import- tant	Not Im- portant	Some	Not * Taught	Some U S P	Omitted in All N F	Some N F	Non off	O C ¹
1 Latin title	54								
2 English title	54						1	1	
3 Official synonyms	54						1	3	
4 Non official synonyms	30	23	1	2	2	1	5	5	
5 Abbreviation	20	17	2	13	3	4	11	10	2
6 Part used	54								
7 Generic and spec names	52	2				1	9	3	
8 Author's name	1	17		28	5	8	18	15	
9 Family name	31	17	3	3	1	3	11	10	
10 Standard of strength	42	5	4	1	4	3	15	17	2
11 Standard of purity	29	18	3	3	6	4	14	16	1
12 Per cent of ash	7	26	4	14	6	7	17	15	3
13 Macroscopic description	38	10	3	3	3	1	14	10	
14 Microscopic description	24	8	9	11	6	1	17	14	4
15 Powder description	21	11	5	12	5	2	18	15	3
16 Preservation	31	16	2	3	1	1	13	12	2
17 Official preparations	26	13	1	1	5	3	12	10	9
18 Adulterants	27	22	4	0	4	1	19	17	1
19 Detection of adulterants	24	18	4	4	5	2	19	18	4
20 Constituents	29	12	8	1	0	2	2	3	
21 Plant description	1	45	0	8	4	2	17	12	
22 History	3	46	0	5	4	3	20	19	
23 Habitat	13	41	0	0	3	1	11	12	
24 Marketing	7	39	0	6	5	4	17	14	
25 Average dose—metric 6 both 26, apothecaries 10					2	2	5	5	9
26 Therapeutic properties —part of pharmacog- nomy—33								4	
A All 26 points covered with every U S P drug—41									
B All 26 points covered with every N F drug—19									
C All 26 points covered with non official drugs—7									
D Microscopic Pharmacognosy							38		
Part of pharmacognosy							19		
Entirely omitted							5		
E When pharmacognosy is taught									
Second year only	15				5				2
First and second	7				10				6
First and third	1				4				1
First, third and fourth	2				1				
F Total credits in pharmacognosy (in semester hours)									
2 5—4 5—10							8		
5 0—6 0—12							20		
7 0—8 5—10							13		
9 0—11 0—11							13		
12 0—22 0—9							6		
?? — 2									

* Some—considered important in certain drugs, in others not important

¹ O C—taught in some course other than pharmacognosy

A majority of the professors concluded that the following points are important, they are arranged in order of relative importance

Latin and English Title, Official Synonyms, Part Used, Botanical Source, Dose, Standard of Strength, Macroscopic Description, Therapeutic Properties, Family Name, Preservation, Non official Synonyms, Constituents, Standard of Purity, Adulterants and Preparations

A majority considered the following unimportant

Detection of Adulterants, Microscopic Description, Powdered Drug Description, Abbreviation, Habitat, Marketing, Ash, History and Plant Description

Even though a large majority (52 of 54) pharmacognosists agree as to the importance of the botanical source, the writer takes exception to its value. In other than a few isolated cases, he will never use the botanical source of a drug, will never come in contact with it in dispensing or in selling drugs and preparations. It appears to be a great waste of time and energy to learn over 300 tongue-twisting Latin names when this time could be put to a much better advantage in learning more about the active constituents of the important drugs so as to be able to predict incompatibilities in dispensing. The student should understand the taxonomical relationship of the botanical names and their value in the U S P from a legal standpoint.

In the case of such things as the descriptions, macroscopic, microscopic and powdered, the standard of purity, the per cent of ash, etc., it appears rather foolish to learn all of these points of the U S P or N F monograph. They are of value for the determining of identity and quality of the drug. The student, on the other hand, should be thoroughly acquainted with the terms used in the descriptions so that he could identify a drug from the official description. The same is true with regard to abbreviations. The pharmacist does not *write* prescriptions, therefore, he should not be required to learn verbatim abbreviations, but should be able to recognize the abbreviation when he sees it in a prescription.

HISTORY OF SCIENCE SOCIETY

Program of St. Louis Meeting

President, C A Browne, Washington, D C, *Secretary*, F E Brasch, Library of Congress, Washington, D C

Thursday Morning, Joint Session with Section on Historical and Philological Sciences (L) and Academy of Science of St. Louis, January 2nd, Mayfair Hotel

The symposiums are as follows: "Study and Teaching of the History of Science," *Chairman*, George Sarton; "Early Science in St. Louis Area," *Chairman*, Chauncey D. Leake

Among the participants are: H T Davis, Indiana University; L C Karpinsky, University of Michigan; U G Mitchell, University of Kansas; Robert S Woodbury, Massachusetts Institute of Technology; Charles A Morris, University of Chicago; Benjamin Ginzburg, Washington, D C; H L Gordon, New York, N Y; Harcourt Brown, Washington University; Solon Buck, The National Archives, Washington, D C; C A Brown, *Retiring President*; Robert E Schlueter, St. Louis; William H Roever, Washington University; Joseph Grindon, St. Louis; Chauncey D Leake, University of California Medical School; A B Hertzman, St. Louis—"William Beaumont—a Photographic Record," Jesse Greenman, Missouri Botanical Garden, Charles F Sherwin, St. Louis

Many of the subjects discussed are of interest to pharmacists, the paper by A B Hertzman is referred to, because the late H M Whelpley presented a paper on the subject, published in the PROCEEDINGS A P H A, for 1903, pages 560-565. It also deals briefly with research on Pepsin.

THE NEW U S PHARMACOPŒIA, ELEVENTH REVISION

The U S P Board of Trustees has announced December 16, 1935, as the date for the release of the U S P XI, and June 1, 1936, as the date when its standards shall supersede those of the U S P X. The following comments are abstracted from statements made by Chairman E Fullerton Cook, of the Committee of Revision

'In presenting this Revision of the Pharmacopœia to the Country the Committee does so with the confident belief that its scope and standards conform to the objective established by the 1930 Pharmacopœial Convention and that it fulfils the present-day needs in its field for both Medicine and Pharmacy. Interim Revisions' with possible annual supplements have been announced by the Board of Trustees "

It may be interesting to note that the U S P XI contains 565 titles of which about 430 have approved therapeutic usefulness although many have similarity in action such as the various quinine salts, the iodides, the bromides the barbiturates etc. The remainder are pharmaceutical necessities, including many crude drugs not administered themselves but employed to make dosage forms of medication. These must necessarily be standardized "

'In the list of admissions will be found 131 pharmaceutical formulas, approximately 30 per cent of the list of therapeutic agents. Most of these formulas can be prepared in the retail pharmacy. Among these are cerates, waters, elixirs, extracts, fluidextracts, liniments, solutions, masses, compound powders, spirits, suppositories, syrups, tinctures and ointments

'The new spelling of sulfate, sulfur, etc. conforming to modern usage may seem strange at first, most of the changes seem logical, such as the adoption of the universally used 'Saccharin' the use of 'Posterior Pituitary' in place of 'Pituitary' necessitated by the use to-day of the whole gland and of the anterior lobe. Other changes may seem strange, for instance the Food and Drug Administration asked that 'Compound Powder of Glycyrrhiza' become 'Compound Powder of Senna' to indicate the more potent constituent, and the physicians of the Committee insisted upon changing the title of 'Compound Mixture of Glycyrrhiza' to 'Compound Mixture of Opium and Glycyrrhiza'. In all of these cases, the synonyms remain and these products will probably always be known by the layman as 'Compound Licorice Powder' and 'Brown Mixture' respectively

"The development of two advisory Boards dealing with the standards for vitamins and for Anti Anemia Products are valuable new features. The Vitamin Board, having among its members Dr Mendel of Yale University, Dr Sherman of Columbia University and Dr E M Nelson, Director of the Vitamin Laboratory of the Government has rendered an important service. The Vitamin A and D standards, developed by this Board, and announced officially by 'Interim Revision,' have already become universally adopted in this Country, and the 'U S P Reference Cod Liver Oil, of known vitamin potency, is being distributed throughout the world through the cooperation of the Vitamin Committee of the Health Organization of the League of Nations. The Vitamin Board is now conducting a series of studies of Vitamin B₁ Assay methods in which 26 laboratories in this Country and abroad are participating

'The Anti Anemia Products Advisory Board consists of Doctors Minot and Castle of Harvard Medical School, Dr Isaacs, director of the Simpson Institute of Ann Arbor, Dr Palmer of the Medical Center, New York City with Dr C W Edmunds, *Chairman*. This Board will indicate liver and stomach preparations which are of Pharmacopœial quality—as indicated by submitted clinical data. This is a new service for physicians which the Pharmacopœia is undertaking "

'International Relations—The U S P XI has adopted a number of International Standards such as those for Vitamins A and D and for digitals and those approved by the last Brussels Conference. Throughout the revision the Committee has maintained a most friendly cooperation with the British Pharmacopœial Commission in an effort to harmonize the titles and standard of these two Pharmacopœias "

Percentage Solutions—A new feature is the suggestion among the General Notices of the U S P XI, page 4, that prescriptions calling for percentage solutions be prepared, when not otherwise directed, by dissolving the substance (if a solid) in accordance with the principle 'weight in volume'. For instance, for a 1 per cent solution, dissolve 4.5 grains of the substance in sufficient of the solvent to measure 1 fluidounce. This follows the custom of most pharmacists

and also the precedent established by the latest British Pharmacopœia, and should establish a uniformity badly needed in prescription practice in this Country "

The Pharmacopœia XI will be on sale December 16th, and replace the Pharmacopœia X, hence all users of the Pharmacopœia will have opportunity for studying the former, therefore references will be made without comment, to items included in the statement by the chairman

"Alternative Formulas," "Reference Standards," "Some Important Revision Changes" "Increased Strength of Acids," "Ether for Anesthesia and Solvent Ether," "Biological Products," "Camphor and Menthol," "Digitalis," "Emulsions," "Ephedrine," "Ergot," "Bichloride Tablets," "Liver and Stomach Anti-Anemia Preparations" "Solution of Magnesium Citrate," "Ipecac," "Fowler's Solution," "Solution of Sodium Hypochlorite," "Quinine Sulfate," "Sodium Phosphate," "Sapo Durus," "Sapo Mollis," "Glycerin Suppositories," "Antiseptic Iodine Solution," "Tryparsamide," "Ointments," "General Tests, Vitamin Assays, Reference Standards, Reagents, Tests and Standard Solutions, Hydrogen-Ion and Tables," "Color Standards "

The Committee of Revision and Associates Under the subhead of the Chairman's Statement, the closing paragraphs are quoted in full

"When Dr Lyman Spalding, on February 28, 1818, issued a call for voluntary assistance in the preparation of a Pharmacopœia for the United States, he characteristically described the type of professionally minded and trained scientists who could or would coöperate in the making of a Pharmacopœia He said they would have to be 'gentlemen, willing to act and men distinguished for their ability and learning' "

"In this day when intensive commercialism, selfishness and personal ambition largely influence many men, even those associated with the traditionally altruistic professions of medicine and pharmacy, it is gratifying to find those standards of Dr Spalding, announced one hundred and eighteen years ago, so splendidly realized The willingness to assume large responsibility by men distinguished for their ability and learning and the continuous and untiring labor of years during those extra hours which were not demanded for their regular, exacting duties, alone make possible a publication like the U S P

"Among the members of the Pharmacopœial Board of Trustees, the Committee of Revision, the auxiliary boards and associated scientists will be found the names of men and women known internationally for their contributions to the latest developments in the medical and pharmaceutical sciences Only the voluntary service plan of the Pharmacopœia could command the help and association of those forming this distinguished group "

John Uri Lloyd, president of the AMERICAN PHARMACEUTICAL ASSOCIATION, 1887-1888 and aged 86 years, in writing to the Remington Medalist, S L Hilton, said that "things were becoming monotonous" so he with his daughter and son-in law, Dr Welbourn of Los Angeles, visited Japan While there, he was delightfully entertained, among the hosts Hajime Hoshi who has made a return visit

The latter is head of the Hoshi Pharmaceutical Co Ltd, Tokyo, Japan, which from a small beginning now owns and controls the greater number of retail stores in Japan and owns the Formosa quinine area

Mr Hoshi credits the rapid growth of his pharmaceutical manufacturing and retail selling organization to the careful training of its

sales representatives and factory executives, in this training, the Hoshi Commercial School in Tokyo plays an important part Here, from 150 to 200 young men who desire to enter the pharmaceutical profession are trained under competent instructors, not only in the profession of pharmacy, but also as expert salesmen and factory supervisors

To encourage young men to enter the profession of pharmacy, a selective plan is employed to provide group managers and factory supervisors A record is kept of their graduates from the time they enter the school and all through their work in the field The men who show themselves to be best fitted for this type of work are promoted to the higher executive positions

A Joyful Christmas and a Successful
New Year.

PROCEEDINGS OF THE LOCAL BRANCHES

"All papers presented to the Association and Branches shall become the property of the Association with the understanding that they are not to be published in any other publication prior to their publication in those of the Association, except with the consent of the Council "

—Part of Chapter VI, Article VI of the By-Laws

ARTICLE III of Chapter VII reads "The objects and aims of local branches of this Association shall be the same as set forth in ARTICLE I of the Constitution of this body, *and the acts of local branches shall in no way commit or bind this Association and can only serve as recommendations to it* And no local branch shall enact any article of Constitution or By-Law to conflict with the Constitution or By Laws of this Association "

ARTICLE IV of Chapter VII reads "Each local branch having not less than 50 dues paid members of the Association, holding not less than six meetings annually with an attendance of not less than 9 members at each meeting, and the proceedings of which shall have been submitted to the JOURNAL for publication, may elect one representative to the House of Delegates "

Reports of the meeting of the Local Branches shall be mailed to the Editor on the day following the meeting, if possible Minutes should be typewritten with wide spaces between the lines Care should be taken to give proper names correctly and manuscript should be signed by the reporter *Please advise us of changes in Roster and mail reports promptly*

BALTIMORE

The regular monthly meeting of the Baltimore Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held on December 12th at the Hotel Emerson The meeting was called to order by President Wm F Reindollar A short business meeting was held prior to the introduction of the speaker of the evening

The secretary read a communication from Dr A Ziefle, chairman of the Committee on Local Branches of the AMERICAN PHARMACEUTICAL ASSOCIATION concerning the pending matter of the allocation of one dollar yearly by the parent organization to the Local Branches for each member, the annual dues of the Local Branches to be dispensed with It was moved and seconded, "that the Baltimore Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION go on record as approving the recommendation before the Council concerning the rebate of one dollar per member for Local Branches " This motion was approved Chairman Ziefle will be informed of the action taken in this matter

The secretary read further in Dr Ziefle's letter concerning membership in the Local Branches as restricted to members in the parent body Since it has been the custom for years in the Baltimore Branch to admit to membership non members of the A PH A , it was moved by the secretary and seconded 'that the Baltimore Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION formally extend the privilege of membership to non members of the AMERICAN PHARMACEUTICAL ASSOCIATION Such members to pay the yearly dues of one dollar and further that the Baltimore Branch attempt to interest all such local members in membership in the parent organization " Approved

The secretary read communications from Dr Ernest Little, Dr E F Kelly and the report of the Committee on Resolutions of the A PH A as submitted at the Portland Meeting No action was taken by the Branch concerning these communications

New business introduced at this meeting was as follows In view of the fact that the officers of the Branch have for the past several years been totally unsuccessful in arranging program meetings that attracted an attendance of members that was not embarrassing to the speaker and members present and because very few retail pharmacists ever attended the meetings, the following motion was made 'That the President appoint at this meeting, a special committee of three active members of the Branch to present before this organization at the next meeting a report of a survey of the membership to consist of the following—To determine by vote the advisability of dissolving the Baltimore Branch of the A PH A , if this is not advisable to determine if possible, what type of meetings and how many a year are desired by the membership '" It was moved by Carr, seconded and carried President Reindollar appointed to this special committee C Jelleff Carr, *Chairman* Glenn L Jenkins and Simon Solomon President Rem

dollar appointed as the chairman of the Nominating Committee, Simon Solomon, the two other members of this committee are to be selected by the chairman

President Reindollar introduced the speaker of the evening, Dr W C Harden, Research Chemist, Hynson, Westcott and Dunning, Baltimore, Md Dr Harden selected for his topic "Organic Antiseptics with reference to Structure, Physical and Bactericidal Properties" The speaker gave a brief review of the history of antiseptics pointing out the compounds that were first used as germicides and stated that he would limit his discussion to those compounds related to the aromatic phenols It was shown how the chemist starting with simple alkyl phenols prepared vast numbers of substances related to the alkyl resorcinols and the alkyl phenolic ethers and how the remarkably high phenol coefficients of modern antiseptics are achieved Dr Harden described the studies on the effect of alkyl groups on bactericidal activity when combined in phenolic compounds the effect of molecular weight on bactericidal activity and how salt formation rendered these extremely potent compounds practically inactive Finally, he raised such interesting questions as, does the molecular weight or physical property of a compound play the most important part in determining bactericidal action? And how can the chemist prepare compounds that are destructive to bacteria and still harmless to humans? A general discussion followed A rising vote of thanks was tendered Dr Harden

C JELLEFF CARR, *Secretary-Treasurer*

ORGANIZATION OF STUDENTS' AUXILIARY OF THE MARYLAND PHARMACEUTICAL ASSOCIATION AT THE SCHOOL OF PHARMACY OF THE UNIVERSITY OF MARYLAND

At the annual convention of the Maryland Pharmaceutical Association held in June 1935 the Constitution and By-Laws of the Association were amended to provide for a Students' Auxiliary to be organized at the School of Pharmacy of the University of Maryland

This Students' Auxiliary is formed for the purpose of familiarizing students of pharmacy with the conditions existing in and problems confronting their profession, to promote closer contact between the pharmacist and the student of the profession, and to provide early training in organization work

The first meeting was recently held at the School of Pharmacy, with Dr M R Thompson Professor of Pharmacology as the presiding officer Dr Glenn L Jenkins, Professor of Pharmaceutical Chemistry, presented a short history of the Maryland Pharmaceutical Association and the purpose of the Students' Auxiliary Constitution and By-Laws were adopted

The following are the officers for 1935-1936 *President*, P H Thompson, *First Vice President*, J R Karns, *Second Vice President*, W Gakenheimer, *Secretary* Miss S Gluckman, *Treasurer*, R Thompson, *Editor*, R V Robinson *Executive Committee* A Tramer, G A Mouat, G Kelley, M R Thompson Frank J Slama

The members of the Students' Auxiliary will regularly receive the monthly publication of the Maryland Pharmaceutical Association—*The Maryland Pharmacist*

CHICAGO

The regular monthly meeting of the Chicago Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held November 22nd, at the University of Illinois College of Pharmacy

The speaker of the evening was H S Noel, Assistant Director of the Advertising Department of Eli Lilly & Company, and Editor of *Tile and Till* Mr Noel spoke on "The Future Outlook for Financial Success in Pharmacy"

At the opening of the meeting Mr Emig, of the University of Illinois College of Pharmacy gave a review of the outstanding articles in the last JOURNAL OF THE A P H A

This report was well received and called for many discussions from the audience

Mr Noel began his discussion by contrasting in retrospect the years 1935 and 1900 A store in one town that did \$3750 00 business in 1900 did \$14 000 00 worth of business in the year 1935 This shows that the diversity of items sold in the drug stores to day has greatly increased the volume of business He stressed the value of the personality of the owner and clerks in building up and retaining business

The Lilly Drug Store Survey was begun in Virginia in 1922 In 1932 there were 272 reports from retail druggists as compared to 402 in 1933 and 394 in 1934 Mr Noel reported

that the greatest trouble found in getting reports from the druggists was that they do not keep accurate and complete business records, or in many cases none at all

Figures were shown that would leave the owner of the average store a net return of 6% on sales. The faults named as the cause for this low percentage of profit were, the high cost of merchandising and the lack of proper control over drug store expenses. It was added that profit can be lost through carelessness and through inability to get a turnover on merchandise.

Nine essentials were named as a prerequisite to a profitable drug store. They are:

- 1 Importance of a buying budget
- 2 Importance of an annual inventory
- 3 Orderly and clean stock
- 4 Accurate records
- 5 Daily verification of sales and expenses
- 6 Importance of taking cash discounts
- 7 Avoidance of wastes
- 8 Trained help and allocation of responsibility
- 9 Concentration of purchases to a few sources of supply

At the conclusion of the discussion Mr. Noel answered many questions and gave added information to those interested.

LAWRENCE TEMPLETON, *Secretary Treasurer*

NEW YORK

The November 1935 meeting of the New York Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held November 11th at the College of Pharmacy, Columbia University. About forty-five members and their guests were present.

The secretary read the report of the October meeting and the report of the special meeting in Washington, the occasion of the Remington Medal presentation to Dr. Samuel L. Hilton. Both reports were accepted.

Chairman Lehman of the Committee on Legislation and Education, rendered the following report:

National Legislation—As the United States Congress is due to convene in two months and the Legislative Machinery is being set in motion as far as pharmaceutical interests are concerned the following program is being organized:

An enabling act is being sponsored by the National Association of Retail Druggists and allied organizations. This will amend the Clayton act as follows: "Provided that nothing herein shall render illegal contracts or agreements prescribing minimum prices for the sale or resale of a commodity which bears the trade mark, brand or the name of the producer or owner of such commodity and which is in fair competition with commodities of the same general class produced by others, when such contracts or agreements are lawful under any statute now or hereafter in effect in any state, territory or the District of Columbia in which such sale or resale is to be made and the making of such contracts or agreements shall not be an unfair method of competition under Section 45, Title 15 U. S. C."

This would permit resale price agreements in such states as have passed Fair Trade Laws.

It will be introduced in the Senate by Senator Tydings, Maryland.

The Patman Bill will be reintroduced, which provides that no special or quantity discounts shall be allowed which are not given on all purchases large or small.

The Copeland Pure Food and Drug Law will come up again perhaps in a slightly altered form, and it is hoped that it will pass this time.

Every employer of eight or more persons is subject to the new Pay roll and Wage Taxes. On and after January 1, 1936 for the Calendar year 1936 the tax is 1%. 1937, 2%, after December 31, 1937, 3% on the Wage Tax. The Pay-roll Tax only becomes effective on January 1, 1937, and starts with 1%, with graduations every three years until it reaches 3%. These assessments are designed to provide old age pensions etc., in the future.

Every manufacturer of Toilet Preparations must make monthly returns in duplicate to the Bureau of Internal Revenue, and pay a 10% tax. This includes all non official preparations also mixtures of official drugs, such as, for instance, Rose Water and Glycerine. The list embraces

Hair Tonics, Hair Restorers, Hair Dyes, Wave Setting Fluids, Rouges, Face Powders, Face Lotions, Skin Cleansers, etc , etc

The Federal Trade Commission is proceeding against manufacturers of inferior rubbing alcohols, especially where such compounds do not contain ethyl alcohol as a base, or where the ethyl alcohol content is negligible. Several Chicago concerns have agreed to cease and desist.

The New York State Fair Trade Law is gaining more support on the part of wholesalers and manufacturers daily. Over fifty manufacturing firms have agreed to issue contracts which have now been approved by the Fair Trade Committee of the New York State Pharmaceutical Association, and seven wholesalers have prepared omnibus contracts.

Frederick C. A. Schaefer, Branch delegate to N. Y. Pharmaceutical Council, reported that a great mass meeting of retailers had been held on October 28th, to discuss ways and means of encouraging manufacturers and retailers to sign the Fair Trade Contracts. The meeting was a great success, being attended by about 2000-2500 persons.

Chairman Steiger, of Progress of Pharmacy Committee, reported the following:

"A short paragraph in Lilly's *Tide and Till* is devoted to cyanide poisoning. It is stated that 243 deaths were recorded by cyanide poisoning in 1931 and that this figure rose to 416 in 1933. The new method of reviving persons who have taken cyanide consists of successive injections of sodium nitrite and sodium thiosulphate into the patient's veins. This combination is reported to be ten times as effective as methylene blue."

Most suicides do not choose a too certain death and the proportion using cyanide will probably increase as the news of these new antidotes is published.

The *Oil, Paint and Drug Reporter*, for October 28th, reports that chlorophyll made in the United States is now offered commercially by "American Chlorophyll Inc.," Washington, D. C. The company is also offering to the food and drug industries Carotene and Xanthophyll, as well as combinations of the three chloroplast pigments. For some time the company has been supplying these products to universities and laboratories for scientific use.

The *Oil, Paint and Drug Reporter*, of November 4th, announced that George Brean & Co., pharmaceutical manufacturers of Kansas City, has been given the decision in a suit against it by the Wisconsin Alumni Research Foundation, alleging infringement of a patent on the use of copper with iron in the treatment of anemia. The basis of the Court's decision was the conclusion that the subject matter of the Hart patent had been anticipated by numerous foreign publications dating back to articles by L. Mandini of Venice in 1862.

The *Drug Trade News*, of November 11th, reports that Spencer Kellogg & Sons, Inc., have developed a castor oil which, it is claimed, will not offend the most delicate sense of taste and smell.

In a paper read before the American Public Health Association, Drs. Robinson and McKahn reported that purified placental extract prevents measles. In many ways, Dr. Robinson points out this means of combating measles is merely the revival of an old heathen custom. Many centuries before the present development in medicine, it was customary to dry the placenta. If a child became ill, he might be given some of his own placenta.

A new, economically produced skin disinfectant, known officially as "a compound alcoholic solution of mercuric chloride" has been developed by two investigators at the University of Illinois, Department of Bacteriology and Health. It is reported to contain 50% ethyl alcohol, and varying proportions of acetone, mercuric chloride, hydrochloric acid, chrysodim and distilled water. It is described as 350 times as powerful in killing germs as phenol, three times as powerful as tincture of iodine, etc., and other widely used skin disinfectants, it is said to be easily prepared. Each ingredient was added for a definite purpose. The alcohol serves to increase penetration, acetone to remove fats always present on the skin and coloring matter was added to show the "field" or area of skin covered by the disinfectant.

Under the heading of old business, the secretary referred to the letter received from the Comptroller's office of the City of New York. After a brief discussion it was decided to leave the matter as is.

Dr. Ballard then reported that cards, urging the election of two Branch members, namely, Dr. J. Leon Lascoff and Dr. Robert P. Fischelis to offices in the A. P. H. A., had been mailed to all Branch members.

Under new business, Dr. Ballard suggested that a letter of thanks be sent to Augustus C.

Taylor, Washington, for arranging the successful dinner in honor of Dr Hilton This was placed in the form of a motion by Dr H V Army, duly seconded and approved

A communication from Dr Ernest Little was then read This called attention to Dr Little's article on increasing ASSOCIATION membership, which was recently published in the JOURNAL

Before proceeding to the Scientific Session, President Ballard called attention to the fact that the next Branch meeting would be held in the Brooklyn College of Pharmacy Long Island University

Dr Ballard then introduced the speaker for the evening, Dr Louis Faugeres Bishop Jr, who spoke on 'Coronary Artery Disease' An abstract of Dr Bishop's address follows

In the general problem of heart diseases, that of the coronary artery is the most important part The oldest case on record for this type of heart disease is that of Buddha in 400 B C Coronary thrombosis is a frequent cause of death among the higher intellectual groups, and the death of former President Coolidge as well as Billy Sunday was due to coronary thrombosis

Methods of prevention center around a better understanding by the layman of the causes and consequences Coronary thrombosis is on the increase and this is likely due to the present type of life Although most cases occur in people past middle age younger people have also suffered

Before continuing with his address, Dr Bishop showed a motion picture film of the human heart He pointed out the two coronary arteries, which supply blood to the heart The motion pictures were really remarkable in that they very plainly showed the heart action through two complete cycles in which each step was being recorded on a graph by means of the electrocardiograph The electrocardiograms of both normal and pathological heart conditions were shown

Continuing with his discussion, Dr Bishop stated that in pathologic conditions the left coronary artery was the most important The patient begins to complain of pain, after eating, exertion, emotion or excitement This pain *Angina pectoris*, is of course, a symptom and not a disease The pain may run from heart to left arm, to the teeth, to the abdomen and to the chest Numerous conditions can bring on this pain, and in this connection Dr Bishop cited some interesting cases from his own experiences

There are many theories explaining the cause of *Angina pectoris* and best opinion indicates that the deficient blood supply to the heart is responsible

Sometimes persons suffering from coronary artery disease, show no history of pain, but complain of shortness of breath, others experience vague stomach symptoms and in some cases no symptoms at all are noted, and the pathologic condition can only be discovered by means of an electrocardiograph

Now the symptoms just discussed indicate an incomplete obstruction in the flow of blood to the heart muscle An accident may occur and bring on thrombosis when the supply of blood to one part of the heart is cut off In this case continuous pain is experienced Shock results the blood pressure falls and treatment for shock must be immediately instituted

Thrombosis occurs usually in individuals between 50 and 60 years of age However, Dr Bishop mentioned that he had seen cases in patients from 34 to 70 years of age It occurs more in males than in females, the proportion being about 3 or 4 to 1 Occasionally it is difficult to recognize thrombosis and early diagnoses have sometimes proved to be false Coronary thrombosis usually occurs in the left descending branch of the coronary artery Since the heart is supplied by two arterial branches a block in one does not completely cut off the blood supply to the heart muscle The portions of the heart supplied by each branch were carefully shown in lantern slides It was pointed out that there are portions of the heart muscle supplied by both arterial branches

The importance of comparative records, before and after an attack of thrombosis was especially emphasized

In discussing treatment Dr Bishop divided the procedure into two parts, one before thrombosis, the other after coronary thrombosis

I *Before Thrombosis*—The examination of patient and placing him under a physician's care already serves to improve the patient Drugs, as nitroglycerin, are especially recommended

and the patient should carry some with him for emergency use. The life of the individual should be regulated to avoid emotion and excitement. Diet does not require regulation as to kind but as to quantity, less should be eaten at one time. The purine drugs, as Theophylline and Theobromine and their salts, find a place but it is sometimes difficult to evaluate their benefit.

2 *After Coronary Thrombosis*—The treatment is different. A long period of rest must follow. Recovery from the first attack occurs in 80–85% of the cases. A spirit of optimism must be instilled in the patient. New blood vessels form in the heart and patients have lived 17 years after the first attack.

After a severe attack the treatment for shock is most important. For this morphine is very valuable, occasionally, oxygen is also employed.

Finally, in discussing future prevention, Dr. Bishop called attention to the health rules laid down by Commissioner Rice. These rules emphasized better living, more rest, less cocktails, avoid nervous excitement, learn to relax and how to spend leisure time free from worry and excitement.

President Ballard thanked the speaker for his lucid and understandable discussion and asked the audience if there were any questions.

Dr. Bilhuber responded by asking the speaker the place of digitalis, caffeine and alcohol in the treatment of coronary artery disease.

In reply Dr. Bishop stated that digitalis requires careful use. In congestive heart failure, digitalis is useful. It is usually not used after coronary thrombosis. Alcohol has a definite place, being useful in *Angina pectoris* where it acts like nitroglycerin. Its danger lies in the coincidental reactions as stimulation of appetite with danger of overeating. It is a mistake to deprive older people of alcohol. Caffeine is the best stimulant for shock. Dr. Bishop claimed no experience with the use of caffeine in *Angina pectoris*.

Dr. Lascoff asked a question concerning the use of adrenalin. In reply Dr. Bishop stated that the blood pressure falls far and fast in coronary thrombosis. In such cases adrenalin helps to get over the critical or shock period, it should be used with care.

Answering several other questions, Dr. Bishop stated that he had had no experience in the use of calcium for coronary artery disease, and that false or pseudo *Angina pectoris* was simply a general name applied to pain in the chest which might be due to a variety of causes.

There being no further questions, a rising vote of thanks was accorded the speaker and the meeting adjourned.

RUDOLF HAUCK, *Secretary*

PHILADELPHIA

The December meeting of the Philadelphia Branch AMERICAN PHARMACEUTICAL ASSOCIATION, was held in the auditorium of the Philadelphia College of Pharmacy and Science, December 10th, E. H. MacLaughlin presiding.

Donald C. A. Butts, director of the Emery Laboratories of Cancer Research, and affiliated with the Philadelphia College of Pharmacy and Science, Saint Luke's and Children's Hospitals of Philadelphia, was introduced as the guest speaker. He spoke on "The Past, Present and Future of Cancer Research," and gave the high lights of the advances made in cancer research from the year 1500 B. C. to the present day. A brief discussion of some of the more important theories and researches on cancer was presented.

Mr. Butts pointed out that cancer was definitely on the increase. He enumerated upon the three most effective weapons against cancer, namely, Surgery, radium and X-ray treatments, lantern slides and moving pictures were shown to illustrate how cancer researches were carried out.

The meeting was then thrown open for discussion, and Dr. Frederick James, professor of Histo Pathology and director of the Isaac Dorr Research Laboratory of Temple University, School of Dentistry, lauded the speaker for his most interesting lecture.

GEORGE E. BYERS, *Secretary*

PITTSBURGH

A meeting of the Pittsburgh Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held November 9th.

The meeting was called to order, in the main lecture room of the Falk Clinic at 8 00 P M, by acting chairman, Frank S McGinnis

The minutes of the last regular meeting were read and approved

Mr McGinnis appointed the following nominating committee to report at the December meeting C T Van Meter, A F Judd and E C Reif, *Chairman*

A splendid report of the 83rd annual convention, held at Portland Oregon was presented by Delegate C Leonard O'Connell

The chairman called on Louis Saalbach to tell about the progress of the National Formulary revision Dr Saalbach, serving as vice chairman of the National Formulary Revision Committee indicated that the new N F would soon be ready for release

The past-presidents of the Pittsburgh Branch were called on in order and each contributed interesting information

The program of the evening was presented by the Department of Pharmacy of the University of Pittsburgh School of Pharmacy A demonstration was made by the staff members of the manufacturing equipment installed in the Pharmacy of the Falk Clinic

Among the new installations in the manufacturing department is a Colton 2 B single punch tablet machine, an ointment mill and complete equipment for filling and closing ointments in tubes A twenty gallon tumble barrel is in operation together with all the equipment needed for granulating substances for tablets

Among the many interesting demonstrations was the apparatus used for filling tubes with ophthalmic ointment and the technique involved in preparing sterile solutions in bulk packages

A very entertaining and instructive program was presented by the Pharmacy staff

STEPHEN WILSON, *Reporter*

ST JOHN'S UNIVERSITY STUDENT BRANCH

The regular monthly meeting of the St John's University Student Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held on Friday evening November 22, 1935 The meeting was called to order by the treasurer Andor Hacker who acted as chairman A group of fifty including members, students, guests and members of the faculty were present

The treasurer submitted a report covering the year 1934-1935 showing a balance of \$7 50

Dr Victor Fourman Chief Chemist of Campagne-Parento was introduced He announced as his subject

THE PRODUCTION AND USE OF OTTO OF ROSE

Dr Fourman dealt with the history of rose oil and rose water pointing out that according to one authority the province of Faristan was required to pay an annual tribute of 30,000 bottles of rose water to the Treasury of Bagdad as far back as 810 A D The town of Kazanlık " he said 'has been the center of the industry for the past 300 years ' With the aid of a motion picture the lecturer then described the cultivation and harvesting of the roses and the apparatus used in the production of the oil He pointed out that nearly two tons of flowers were needed to produce one pound of oil

The chemical composition of the oil is very complex, pointed out Dr Fourman indicating that at least thirty constituents have been found and estimating that there might be twenty others present At this point Dr Fourman displayed an "original vase" of the Bulgarian oil, showing the government stamps and seals affixed Great interest was shown in this and in the lecturer's collection of pseudo rose oils The value of the oil varies greatly and depends on the amount of natural otto it contains, it was pointed out

In the discussion that followed the lecturer discussed the value of congealing point as a test for purity pointing out that since this factor varies even with pure oils it is of little use In discussing the quality of rose water sold in drug stores, Mr Orris pointed out that reputable manufacturers use natural otto in making the so called fluid rose soluble In answer to a question, the lecturer pointed out that in his opinion, there is no scientific explanation for the empiric practice of preserving rose water and stronger rose water by stoppering the bottles with a pledget of cotton

A rising vote of thanks was extended Dr Fourman and to Compagne Parento for the interesting lecture and demonstration

DOROTHY CIMAROSA, *Acting Secretary*

ASSOCIATION BUSINESS

AD INTERIM BUSINESS OF THE COUNCIL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, 1935-1936

Office of the Secretary 2215 Constitution Ave , Washington, D C

LETTER NO 9

November 29, 1935

To the Members of the Council

53 *Flexible Leather Binding for N F VI* Motion No 12 (Council Letter No 8 page 1036) has been carried and the retail selling price is set at \$6 00 per copy

Dr Fischelis wrote as follows

"I am voting *no* on Motion Number 12 because I believe the price of the National Formulary and the U S P to the trade is too high You will recall that I recorded myself in the negative when the original price was voted on and I am voting *no* on Motion Number 12 for the same reason "

54 *Special Committee on Emblem* Motion No 13 (Council Letter No 8, page 1036) has been carried and the Mellon Institute is granted permission to use the A P H A emblem under the conditions mentioned

55 *Use of Text of N F* Motion No 14 (Council Letter No 8 page 1037) has been carried and Mr McClintock has been advised

56 *Election of Members* Motion No 15 (Council Letter No 8 page 1038) has been carried and applicants for membership numbered 44 to 101, inclusive are declared elected

57 *Meeting of the Council* All members of the Council have responded and a majority have indicated a preference for Thursday, December 5th as the date of the coming meeting Chairman Hilton has, therefore, called the meeting of the Council at the AMERICAN INSTITUTE OF PHARMACY on Thursday December 5 1935 beginning at 10 00 A M It is expected that a morning, an afternoon and an evening session will be necessary It is hoped that each member of the Council can arrange to be present

E F KELLY, *Secretary*

LETTER NO 10

December 10 1935

To the Members of the Council

The second meeting of the Council for 1935-1936 was held at the AMERICAN INSTITUTE OF PHARMACY, Washington, D C, on Thursday, December 5, 1935, beginning at 10 15 A M, in response to the call of the chairman and to the action of the Council (see Council Letters No 22 (1934-1935), Item 142, No 8 (1935-1936), Item 51 and No 9, Item 57) Morning afternoon and evening sessions were held and the following members were present Hilton Army Christensen Cook, Costello, Delgado DuMez Dunning Eberle, Fischelis, Hayman Holton Kelly, Philip and Swann

Messages were received from Walter D Adams, J H Beal and C H LaWall and on motion of Hayman Cook, the secretary was requested to express to these gentlemen the regrets of the Council that they could not be present

58 *Report of the Committee on Finance* Chairman Philip submitted a verbal report reviewing the financial status of the ASSOCIATION Disbursements under the budget for 1935 had been kept below appropriations in most instances and did not exceed receipts It had been necessary, however, to allow some bills to accumulate because of the low receipts from N F V and R B II for the year, because of the cost of completing the N F VI and because of the delay in issuing it The accumulated bills will be paid after the issuance of N F VI

Attention was called to the increased expense of the revision of the N F and to the difficulty of maintaining a balanced budget because receipts and expenses over a decade varied so greatly from the estimates The same difficulty was experienced with the YEAR BOOK and with the JOURNAL and it is expected that with the completion of the YEAR BOOK series in 1936 and with

the publication monthly in the A PH A JOURNAL of the material heretofore appearing in the YEAR BOOK, a more accurate budget for these publications can be worked out and maintained

The returns from dues had shown an increase and the committee believed that the ASSOCIATION had passed through recent conditions very satisfactorily

National Formulary—Particular attention had been given by the Committee to the finances of the National Formulary and to the recommendations of the Committee on N F as submitted in its annual report to the Council at Portland It was believed that the program of continuous revision as approved, will serve to largely equalize the previous variations in annual expenses over the decade and to stabilize the annual budget However, the annual receipts are greatest during the first years of the decade and gradually decline The suggestion that a fixed amount of the receipts from each copy of N F VI sold be set aside in a separate fund for N F revision and that this fund which should be estimated on the basis of copies sold during the preceding decade, should be budgetted equally over the decade, was approved as the best means of meeting the situation After the cost of production and the fixed amount for revision are deducted from the receipts, the balance will be equally divided, as heretofore, between the Research Fund and the Current Fund, so that $\frac{2}{3}$ of net receipts will be devoted to research and revision

(*Motion No 16*) After a general discussion of the proposal, it was moved by Costello that one dollar of the return from the sale of each copy of N F VI be allocated to the expenses of the Committee on N F and be placed in a separate fund for that purpose The motion was seconded by Philip and carried

Chairman Philip stated that on the basis of the sale of N F V, this special revision fund covered by Motion No 16 would amount to approximately \$50,000 00 or to about \$5000 00 per year over the decade On this basis, Chairman Gathercoal had, upon request, suggested the following general budget for N F revision for 1936

Clerical expenses	\$1100 00
N F bulletin	500 00
Supplies and miscellaneous	200 00
Chairman's traveling expenses	400 00
Publicity and exhibits	300 00
Investigation and revision	2500 00

(*Motion No 17*) After discussion, it was moved by Dunning that the budget for N F revision as suggested by Chairman Gathercoal be approved for inclusion in the ASSOCIATION'S Budget for 1936 with the understanding that only so much of the appropriation as is required or is available will be expended The motion was seconded by Army and carried

Committee on Research—The Committee on Finance approved the award for 1935-1936 of \$1500 00 from the Research Fund for research on the subject of tests and assays for (a) N F ampul solutions, (b) N F tablets, as recommended by the Committee on Research in its report to the Council at the Portland meeting (see A PH A JOURNAL August 1935, page 702, Item 136)

In this connection, Chairman Army called attention to the expectation, as expressed in the report that this grant will be renewed for a second or even a third year following the precedent that a comprehensive piece of research should be carried on for as long as three years if the results justified it There followed a lengthy discussion of the Research Fund and of the work of the Committee on Research with particular reference to whether the grants should be made for basic research or for research bearing directly on the N F

Although no action was taken, it was the general opinion that the present method of increasing the Research Fund, as separate from the N F revision fund, should be continued, that the Committee on Research should continue to recommend the research awards and that awards should be made in accordance with Article XII of Chapter IV of the By-Laws of the ASSOCIATION

Appropriations for the Section on Practical Pharmacy and Dispensing and for the Committee on Pharmacy Week—Chairman Philip stated that the Committee was not prepared to submit a report with respect to these appropriations as further information was to be furnished by the Section and by the Committee

Budget for 1936—Upon inquiry, Chairman Philip stated that the Committee on Finance was not prepared to submit the budget until definite action had been taken on several matters to be considered by the Council at this meeting and until the Committee was more fully informed as

to the probable receipts from dues, and from the N F It was expected that the budget would be submitted by mail later in the month

59 Sale and Exchange of Bonds Treasurer Holton stated that U S Treasury Bonds 2 $\frac{3}{4}$ %, 1945-1947, dated September 15, 1935, had been received for the following funds and placed in the Treasurer's safe deposit box (see Council Letters Nos 2, Item 19, and No 3, Item 21)

Endowment Fund	\$2000 00	Research Fund	\$7000 00
Centennial Fund	2000 00	Procter Memorial Fund	200 00
Life Membership Fund	6100 00	Remington Honor Medal Fund	100 00

60 Report of Committee on Publications Chairman DuMez submitted a verbal report dealing with the following subjects

A Ph A Journal—The arrangements for publishing the JOURNAL were reviewed, and after a general discussion the Committee was requested to obtain bids, as heretofore, on the publication of the JOURNAL for 1936, on motion of Fischelis Holton

Year Book, Volume 23—The manuscript for this volume is now completed and bids were being secured for its publication and distribution This volume covers the calendar year 1934 and will be the last issued Arrangements had been made to print 300 extra sheets of the Pharmaceutical Abstracts for 1935 and these can be supplied in bound form if desired

Pharmaceutical Abstracts—The original program was to print 32 pages of Abstracts in each issue of the JOURNAL (see JOURNAL, April 1935, page 332) On account of the larger number of Journals being abstracted and the improvement in the abstracting, it was necessary to increase the number of pages to 40 in recent issues and under this arrangement, the material is accumulating with the indication that 48 pages will be required if all available material is published Since March, the average monthly cost for the abstract pages and index, was approximately \$250 00 and the increase to 48 pages will raise the cost proportionately The annual cost of 48 pages is estimated as \$3600 00 for printing and \$900 00 for abstracting and editing, or a total of \$4500 00 which will require an increase in the budget for the JOURNAL

The possibility of decreasing the abstracts in number to avoid duplication with other abstract publications, and in space required, was considered at length and the Committee was requested to study this method of meeting the increasing expense The favorable reception of the abstracts in the monthly JOURNAL was noted and every effort will be put forth to make this section of greater service

(Motion No 18) It was moved by DuMez that 48 pages of Pharmaceutical Abstracts be published monthly in the JOURNAL beginning with the issue for January 1936 The motion was seconded by Hayman and carried

(Motion No 19) It was moved by Swain that a study be made of the possibility of saving expense by publishing the abstracts in a separate volume as originally suggested, to be sent only to those members requesting it, and also of the advisability of making a charge for the abstract journal The motion was seconded by Dunning and carried

Proposed Publication—In accordance with the motion under Item 142, JOUR A PH A August 1935, page 704 further information about the publication had been collected and submitted to the Committee on Publications with a questionnaire requesting an opinion on a number of basic questions However, a report was not available at this time on policy or budget, and it was suggested that the material submitted to the Committee be studied by the Council as a basis for action

The meeting then adjourned until 2 00 P M with the understanding that consideration of the proposed publication would be the order of business

(Afternoon Session)

The attendance was the same as for the morning session

By request, the secretary reviewed the reports of the Special Committee on YEAR BOOK in which it was recommended that a popular publication should be established, the consideration given the recommendation since that time, especially at the last annual meeting, and the information about cost, size and character of the publication as submitted to the Committee on Publications

The subject was discussed at length but the data available was not believed to be sufficient for definite action

(*Motion No 20*) It was moved by Swain Costello and carried that the chairman appoint a Committee on Ways and Means to study the financing, and a Committee on Contents, Scope and Style to study the character of the proposed publication, both committees to be requested to report within three months

61 *Committee on Pharmacy Week* Chairman Hogstad appeared to present a series of recommendations with respect to the future conduct of Pharmacy Week which were generally discussed

(*Motion No 21*) Chairman Hogstad was requested to revise and submit the recommendations for final consideration, on motion of Arny Hayman and he and his associates were given a vote of appreciation for the success of the recent observance

62 *A Ph A - N A R D Joint Committee* Secretary Kelly reported for the three A Ph A delegates that it was planned to have a meeting of the Joint Committee as soon as convenient to the N A R D delegates At the present time, no definite report could be submitted The meeting then adjourned to meet at 7 30 P M

(Evening Session)

The attendance was the same as for the afternoon session with the exception of H A B Dunning who was called away

63 *Reduction in Nominees for the Presidency* The nomination and election of officers of the ASSOCIATION was considered at length

(*Motion No 22*) It was moved by Arny that the Council recommend to the Special Committee on Constitution and By-Laws that the nominees for president, and for first and second vice president be reduced from three to two in each case The motion was seconded by Costello and carried with Fischelis voting in the negative

(*Motion No 23*) It was moved by Philip seconded by Holton and carried that the Council recommend to the Special Committee on Constitution and By-Laws, that the By Laws be so amended as to authorize and direct the Council to fill any vacancies that may occur by resignation sickness, death or otherwise in the list of nominees for the mail ballot

64 *Committee on Proprietary Medicines* The secretary reported that J H Beal had declined because he could not undertake the work, to act as chairman or as a member of the Committee and the chairman stated that as the membership has been elected by the Council in session he did not feel authorized to fill the vacancy by appointment (Council Letter No 1 JOURNAL, August 1935, page 706, Items 13 and 14)

(*Motion No 24*) Roy B Cook was elected Chairman of the Committee on motion of Costello, seconded by Delgado and carried

H H Schaefer was elected a member of the Committee on motion of Fischelis seconded by Arny and carried

65 *Approval of N F VI* The secretary reported that bound copies of the book would be mailed on December 9th to the members of the Council and to the members of the Committee on N F for formal approval in advance of the release of the book for distribution on December 16th

Two unbound copies were submitted to the members present for inspection

(*Motion No 25*) It was moved by Swain that the Council approve the work of the Committee on National Formulary as represented in the printed copies of N F VI submitted, and authorize its publication The motion was seconded by DuMez and carried

66 *Resolution by the N A R D* President Costello read the following letter addressed to him by Secretary Dargavel

'At the annual convention of this ASSOCIATION held in Cincinnati September 23rd to 27th, a resolution was adopted commending Dr E F Kelly for his work on the National Retail Drug Code Authority and following the instructions of the convention we are advising the officers of the AMERICAN PHARMACEUTICAL ASSOCIATION through you of this action

"WHEREAS, the work of Dr E F Kelly as secretary of the National Retail Drug Code Authority was of inestimable value to members and officers of the N A R D and the retail pharmacists of the United States

"Be It Resolved, that the N A R D in convention assembled express its appreciation and thanks to Dr E F Kelly in person and to the AMERICAN PHARMACEU-

TICAL ASSOCIATION for making his services available and that the officers of the AMERICAN PHARMACEUTICAL ASSOCIATION be advised of this action

"The National Association of Retail Druggists appreciates the very splendid effort of Dr Kelly in regard to this work, and also permit me to state that in my opinion it has been the most outstanding work that the AMERICAN PHARMACEUTICAL ASSOCIATION has done in so far as commercial pharmacy is concerned in its history I trust that this letter and resolution will be called to the attention of all the officers of the ASSOCIATION "

(Signed) JOHN W DARGAVEL, *Secretary*

(*Motion No 26*) It was moved by Arny, seconded by Hayman and carried, that the letter be spread on the minutes of the Council

67 *Recommendation No 1 in the President's Address* Chairman Hilton called attention to the fact that consideration of the recommendation was taken up at the reorganization meeting of the Council in Portland and referred to this meeting of the Council A general discussion of the recommendation and of its application followed It was pointed out that Dr Kelly's services to the Maryland Pharmaceutical Association did not require the assumption of administrative activities or extensive absence from his Washington office

(*Motion No 27*) It was moved by Hayman that the secretary be given permission to serve as secretary of the Maryland Pharmaceutical Association if he is requested to do so The motion was seconded by Holton and carried

68 *Election of Members* The following applications were submitted

No 102, Isaac F Harris, The Harris Lab, Inc Tuckahoe, N Y, No 103, Anna S Hoffmann, 98 First Ave, Atlantic Highlands, N J, No 104, Sister Constance Ryan, 365 Sixth Ave, S, Fargo, N Dak, No 105, R R Muntz, Box 1060 Jamestown, N Dak, No 106, Cyril H Mergens, 226 W Rosser Ave, Bismarck, N Dak, No 107, Charles Hersey, Rugby, N Dak, No 108, Joseph P Cutting 207 Main St, Williston, N Dak, No 109, Carl F Kaz, Gackle, N Dak, No 110, Robert Wm Elich, 2310 N Sawyer Ave, Chicago, Ill, No 111, Leonard W H Charnock, 20 E Delaware Pl, Chicago, Ill, No 112 Ray Gist, 1709 Ruby St, Pullman, Wash, No 113, William Engle, 11 Wave Ave, Beachmont, Mass, No 114, August Merz, c/o Calco Chemical Co, Bound Brook, N J, No 115, Albert Greenlees, Methodist Hospital, Houston Texas, No 116, Lillian Herforth Bowen, 130 N Wells St, Chicago, Ill, No 117, Elmer K Walters, 5th and Main Sts, Richmond, Va, No 118, David Jacobson, 701 N 28th St, Richmond, Va, No 119, Joseph Allegratti, 1201 W Grand Ave, Chicago, Ill, No 120, Paul P Famular, 3696 Boulevard, Jersey City, N J, No 121, George L Rumbaugh, 8231 Ingleside Ave, Chicago, Ill, No 122, Charles O Wilson, University of Washington, Seattle, Wash, No 123, Abraham Kruger, 375 Osbourne Terr, Newark, N J, No 124, Henry Louis Debus, Main St, Peapack, N J, No 125, Theodore P Koszalka, 95-06 99th Ave, Ozone Park, N Y, No 126, Saul Rosin, 8701 91st Ave, Woodhaven N Y, No 127, David Shapiro, 663 Miller Ave, Brooklyn, N Y, No 128, Reuben Cheron 275 Hooper St, Brooklyn, N Y, No 129 Herbert B Camis, 101-66 94th St, Ozone Park, N Y, No 130, Olga Julia Berzetes, 9132-79th St, Woodhaven N Y, No 131, Samuel S Katz, 267 Oak St, Perth Amboy, N J, No 132, Oscar S Schwartz, 1034 Hoe Ave, New York, N Y, No 133, Alexander Hollander 140 W 98th St, New York, N Y, No 134, William B Day, 1229 E Dennison St, Davenport, Iowa

(*Motion No 28*) On motion of Cook, seconded by Hayman and carried, the applicants named above were elected members of the ASSOCIATION

69 *Recommendation No 9 in the President's Address* In discussing this recommendation, Dr Fischelis called attention to the value of the 'Professional Pharmacy' to the Boards of Pharmacy in connection with their work in regulating the stock and equipment in drug stores No action was taken on the recommendation

70 *Recommendation No 14 in the President's Address* The secretary reported that this recommendation had been brought to the attention of the chairman of the Committee of Revision of the U S P and it was the opinion that such action as is necessary should be taken jointly with the U S P authorities

(*Motion No 29*) On motion of Fischelis seconded by Arny and carried, the chairman was authorized to appoint a special committee of the Council to study this matter and to cooperate with any committee appointed by the U S P Board of Trustees or Committee of Revision

71 *Recommendation No 17 in the President's Address* Treasurer Holton reported that consideration had been given to the recommendation and submitted the following statement as indicating the money available from the various permanent and trust funds

LIFE MEMBERSHIP—The available accumulated income, since 1920, amounts to \$5843 57

EBERT PRIZE—Income restricted to award

CENTENNIAL—Income to "aid in the prosecution of original investigation "

ENDOWMENT—Income not available until fund amounts to \$25 000 00 when 50% of the income may be used for any purpose deemed wise by the ASSOCIATION Now \$17,020 23

EBERT LEGACY—Income not available until fund amounts to \$10,000 00 and then "shall be devoted to such purposes as will in the opinion of the Council best commemorate the founder of the fund and his services to pharmacy " Now \$8760 76

RESEARCH—Income limited to honoraria and awards

PROCTER—Trust fund

REMINGTON—Trust fund

He concurred in Chairman Philip's statement that it was too early to estimate what might be appropriated from the Current Fund during 1936 toward the inauguration of the activities mentioned

(*Motion No 30*) On motion of Fischelis seconded by Philip and carried, the secretary was requested to list pending activities in the order of their importance and to apply funds now available or which may become available later to their execution

72 *Articles of Incorporation of the A Ph A* Mr Philip submitted the results of his investigation of the incorporation of the ASSOCIATION in 1888 It was requested that the study be continued and that a report be submitted as promptly as is possible for such action as may be required and for the guidance of the Committee on Constitution and By-Laws

73 *Complimentary and Review Copies of N F VI* The secretary reported that in addition to the copies of N F VI in leather which were being sent to the members of the Committee on N F and to the members of the Council, Chairman Gathercoal had submitted a list of those to whom it was recommended that copies of the N F in cloth should be sent as a token of appreciation for their services during its preparation and that the Committee on Publications had submitted a list of pharmaceutical medical and other publications to whom it was recommended that copies in cloth should be sent for review

(*Motion No 31*) On motion of Swain, seconded by Eberle and carried the recommendations with respect to complimentary and review copies of the N F VI were concurred in

As it was impossible to complete the program on account of the lateness of the hour the meeting was adjourned at 11 40 P M, with the understanding that the remaining items of business will be submitted by mail

If any members of the Council desire to submit corrections of the minutes of this meeting, they are requested to do so promptly

E F KELLY *Secretary*

"A COMPARISON OF THE RATIOS OF WISCONSIN DRUG STORES AT THE TIME THE STATE PHARMACY LAW WAS PASSED AND AT PRESENT "

This is one phase of a study of organized pharmaceutical activity in Wisconsin 1880-1930 The number of drug stores in each of the present ten congressional districts is tabulated with the population of that district and the ratio computed The congressional district was chosen as a unit because it is the most satisfactory unit for most if not all of the states

It is of interest to note that in 1862 the ratio was 1 2418 and that a few years ago it was practically the same, viz 1 2498 To draw the inference, as has been done that the pharmacist of to day is therefore as well off financially as he was half a century ago involves a grave misuse of statistics

* Abstract of a paper before Section on Commercial Interests, A Ph A, Portland meeting 1935—by Minnie Meyer and Edward Kremers

COMMITTEE REPORTS

REPORT ON THE TWELFTH INTERNATIONAL CONGRESS OF PHARMACY

BY EDGAR ERSKINE HUME *¹

Mindful of the honor done him, though not a pharmacist, by being appointed Delegate on the part of the United States to the recent International Congress of Pharmacy, the writer feels it a duty to give the information that he gathered at this interesting and important Congress to the pharmaceutical profession of the country. His report to the Secretary of State is therefore given in its entirety, being published with the permission of that officer and of the writer's military superior, the Surgeon General of the Army.

The Twelfth International Congress of Pharmacy was held at Brussels, Belgium, from July 31, 1935, to August 5, 1935, inclusive. The sessions were all held at the University of Brussels, several miles distant from the center of the city, with the exception of certain social features.

The Congress was divided into sections, most of which met separately. Some of these sections were in turn subdivided into subsections, but only for committee work. The following were the sections, with the presidents and secretaries of each.

First Section *Pharmacognosy and Galenic Pharmacy* President, Prof N Wattiez of the University of Brussels, Secretary, Pharmacist G LaGrange

The following topics were considered by the section the presentations being made as indicated



Official Badge of Major Hume as Delegate of the U S to 12th International Congress of Pharmacy

1 "Contribution to the Chemical Study of the *Sapotea* of the Belgian Congo. The *Omphalo carpum* Boysankombo" By Dr L Adriaens of the Chemical Research Laboratories of the Belgian Congo

2 "*Trichisia Gillelthii*, Stamer" By E Castagne, Engineer Chemist of the Chemical Research Laboratories of the Belgian Congo

3 "The Alkaloids of the *Liane Eferi*" By Pharmacist Delvaux of the University of Louvain

4 "The Essential Oil of the Wallflower and of Patchouli from the Belgian Congo" By Dr P Denis of the Chemical Research Laboratory of the Belgian Congo

5 "The Oil of *Euphorbia palustris*" By Prof Paul Gillo of the Faculty of Pharmacy of Nancy

6 "On the Spectrophotometric Dosage of the Alkaloids of the Ergot of Rye by the Reaction of van Urk" By Prof F Sternon of the University of Liège and Juliette Rensonnet

7 Study of the Unification of the Methods of the Preparation of the Heroic Galenic Vegetable Medicaments" By Prof H Golaz of Lausanne

8 "Critical Studies of the Methods of Dosage of Alkaloids in the Official Preparation of Belladonna of the Belgian Pharmacopœia" By Prof N Wattiez, of the University of Brussels and Pharmacist Gaston LaGrange

9 "Opinion Concerning the Standards of the So Called Chaulmoogra Oil for International Acceptance" By Prof E Perrot of the Faculty of Pharmacy of Paris

10 "Contribution to the Study of the Seeds of *Strophanthus Congolais*" By Louise Ghénne Assistant in the Institute of Pharmacy of the University of Liège

Second Section *Pharmaceutical Chemistry* President, Prof A Castille of the University of Louvain, Secretary, Pharmacist L Delvaux

The following topics were considered by the section, the presentation being made as indicated

* Delegate of the United States to the Twelfth International Congress of Pharmacy, Brussels, Belgium, 1935

¹ Major, Medical Corps, U S Army, Librarian, Army Medical Library, Washington, D C

- 1 "Flowing Potentials and Absorptive Power of Barium Sulphate The Role of Colloid Buffers of the Saponines" By Prof Ruyssen of the University of Ghent
- 2 "Titration of Alkaloids in Alcoholic Solution" By Prof Baggesgaard Rasmussen of the Royal Pharmaceutical College of Copenhagen
- 3 "Spectrographic Research on the Alkaloids of Cinchona and Their Derivatives" By Prof van der Wielen of the University of Amsterdam
- 4 "Nucleic Acid in the Ergot of Rye" By Prof M Marek Gatty Kostyal, of the University of Crakow, and J Tesarz
- 5 "The Question of the Dielectric Constant in Problems of Chemical Constitution of the Organic Compounds in Relation to Their Pharmacodynamic Action" By Kazimierz Kalinowski (Poland)
- 6 'Dakin's Solution of the Different Pharmacopœias Analysis and Stability' By Colonel J Thomann, Chief Pharmacist of the Swiss Army Instructor at the University of Bern
- 7 'Preparation and Stability of Dakin's Solution (Sodium Hypochlorite)' By Svend Aage Schou of Hellerup (Denmark)
- 8 "The Dosage of Hydrastine, Scopolamine, Hyoscyamine, Eserine and Apioi by the Mercurimetric Method" By Prof Al Ionescu Matiu of the University of Bucharest and Dr C Popesco
- 9 'Halogen Analogues of Ephedrine and Adrenaline' (Presentation in English) By W H Linnell, M Sc, of London
- 10 "The Stability of Strophanthin Solutions" (Presentation in English) By B Berry, B Sc, of London

Third Section *Chemical Analysis and Toxicology*, Joint Session

Fourth Section *Bromatology* President, Prof T Schoofs of the University of Liège
Secretary, Dr H Lecoq of the University of Liège

The following topics were considered by these sections, the presentations being made as indicated

- 1 "Limits in the Use of the Conductometric Method for the Determination of Bases and Weak Acids" By Konstanty Hrynakowski, of the University of Poznan (Poland) and Feliks Modzejewski
- 2 "The Application of Potentiometric Titration in Pharmaceutical Analyses" By Dr Oldrich Tomicek, Professor at the University of Prague (Czechoslovakia)
- 3 "Contribution to the Iodometric Control of Medicaments" By Prof L Maricq of the University of Brussels
- 4 "The Application of the Determination of the Electrical Conductibility in the Examination of Waters" By J Baldewyns of Liège
- 5 Titrimetric Colorimetry" By Prof D van Os of the University of Groningen (Netherlands) and Dr P Karsten
- 6 "The Toxicity of Certain Insecticides" By Prof F Schoofs of the University of Liège
- 7 'Phytopharmacy' By V Estienne
- 8 "Removal of Impurities by Barium Carbonate" By Pharmacist A Defalque of the Laboratory of Biochemistry of the University of Louvain
- 9 "A New Stabilized Antidote for Poisoning by the Heavy and Toxic Metals" By Prof Casimir Stryzowski of the University of Lausanne
- 10 'A Case of Grave Alimentary Saturnism' By Prof A Castille of the School of Pharmacy of the University of Louvain
- 11 "Quantitative Analysis of the Derivatives of Barbituric Acid A Modification of the Method of Determination in an Alkaline Medium" By Kazimierz Kalinowski (Poland)
- 12 'Diabetic Bread' By Dr T Potjewijd Pharmacist of Leyden
- 13 Spectrographic Study of the Waters of the Region of Spa' By Prof R Vivario of the University of Liège, and P Swings Assistant
- 14 'Analytical Differentiation of Cane Sugar from Beet Sugar' By Pharmacist Herbert of Cairo (Egypt)

Fifth Section Omitted

Sixth Section *Microbiology* President, Prof A J J van de Velde of the University of Ghent, Secretary, Mlle (Pharmacist) Marg van Hauwaert of the University of Ghent

The following topics were considered by the section, the presentation being made as indicated

1 "The Legal Regulation of the Manufacture of Therapeutic Serums and Various Products of Organic Origin" By Prof A Astruc and Louis Astruc

2 "Experimental Pathogenic Action of the Actinomyces" By Prof A Sartory of the Faculty of Pharmacy of the University of Strassburg, R Sartory and Jacques Meyer, Assistants

3 "Influence of Various Acid and Alcohol Bodies and of Serums on the Mutation of the Tubercle Bacillus in Culture Media" By Prof A Sartory of the Faculty of Pharmacy of the University of Strassburg, R Sartory, Jacques Meyer and Mlle Renard, Assistants

4 "Qualitative and Quantitative Determinations of Proteolytic Ferments Contained in the Gastric Juice, by the Interferometric Method" By Prof A Sartory of the Faculty of Pharmacy of the University of Strassburg, R Sartory and Jacques Meyer Assistants

5 "On the Necessity of Sterilizing Medical Supplies" By Prof Bronislaw Kosłowski of the University of Warsaw

6 "Bacteriological Appraisal of Modern Tooth Pastes and Mouth Washes" (Presentation in English) By Dr Eugene Maier of Giessen (Germany)

7 "Study of the Fertility of the Soil on Dosage with Phosphorus and Potassium, by Means of Sterigmatocystis Nigra (Method of Niklas)" By Prof A J J van de Velde of the University of Ghent

Representation

"A I have been thus far, unable to obtain from the Secretary of the Congress a list of the countries represented or the total number of delegates This information will be reported later if ascertained Estimated number of delegates present (or at least persons who attended the sessions) 500 Estimated number of countries represented 30

B American delegation I was the only delegate from the United States"

Results of the Conference Resolutions Adopted (1) *Phytopharmacy*—Upon the motion of Prof V Estienne of the University of Louvain, the following was adopted "Regulations should be elaborated for the manufacture, conditioning, dispensation and control of toxic products used in agriculture and horticulture This Congress desires that this resolution be transmitted to the governments represented The Congress believes that it is the duty of every pharmacist to be actively interested in pharmacotherapeutics in collaboration with regional agriculturists"

(2) *The Necessity of Sterilizing Medical Equipment*—Upon the motion of Prof Bronislaw Kosłowski of Warsaw, the following was adopted A pharmacy, as a sanitary institution, must be careful not to become a place where contagion may be spread The installation must be aseptic The use of glass coverings for the tables and counters, as well as the sterilization of the glassware used in the pharmacy tends to give the impression of the greatest cleanliness, and inspires general confidence One should anticipate the orders of the sanitary authorities that pharmacies be kept aseptic"

(3) *Price Regulation of Specialties Justified by Organized Chemical and Biological Control*—Upon the motion of Pharmacist Breugelmans of Belgium the following was adopted

"I The pharmaceutical profession should be organized corporatively in order to safeguard the scientific, professional and economic interests of its members

"II In consideration of its great advances the pharmaceutical profession should be organized so as to allow the pharmacist to face the requirements of analytical control in conformity to the legal regulations in effect in various countries

"III Professional obligations in this field being assured, monopoly in the sale of materials, and normal profits should be respected

"IV On account of the present extent of university instruction in most countries, the pharmacist has control of chemical products only

"V Since pharmacists have not had the necessary training in such countries, for the examination of biological products, opotherapeutic agents or other materials requiring chemical tests, it is necessary that they have the assistance of qualified assistants with university training in pharmacodynamics and biology

"VI On account of the immensity of the task, there should be created a sufficient number of laboratories for the chemico biological testing of products in order to carry out the examinations required by law

"VII These independent laboratories should be established by the organized profession and under state supervision The State, unable legally to assume responsibility for sale, is able to stimulate and encourage private establishments working in accordance with public health needs

"VIII Organized pharmacy should create, equip and conduct its testing service for a moderate charge, in order to compensate to a certain extent for the cost of maintenance

'IX The State should take over, prior to their establishment, the control of such institutions to insure uniformity and the maintenance of high standards

"X In emergencies, and at first, there might be allowed modifications in the university program, when the need arises, registered pharmacists should be qualified to assume the duty of testing biologicals, having pursued courses of instruction at affiliated laboratories "

(4) *Regulation of Pharmaceutical Responsibility*—Upon the motion of M de Koritsansky and Dr (Pharmacist) Tauffer of the Hungarian Pharmaceutical Association, the following was adopted

"A committee of six members shall be appointed to study minutely and procure data concerning the responsibilities of pharmacists in various countries, and prepare recommendations regarding such regulations The report of this committee shall be considered at the forthcoming meeting of the International Pharmaceutical Federation (*Fédération Internationale Pharmaceutique*) and the decision reached shall thereafter be submitted to the ensuing International Congress of Pharmacy and then brought to the attention of the various national associations forming part of the International Federation Thus such national associations will be able to take the necessary steps with their respective governments to regulate the legal responsibilities of pharmacists "

(5) *Freedom in the Fixing of Charges by Organized Pharmaceutical Services*—Upon the motion of M Pattou, President of the *Nationale Pharmaceutique*, the following was adopted

"Since the representatives of thirty National Associations of pharmacists agree upon the desirability of freedom in the matter of fixing charges, *it is resolved*

"I That patients treated in their homes should be authorized to procure drugs at any pharmacy that accepts the conditions of organization

"II That fees for the furnishing of medicines for patients treated in their homes by organized services cannot be standardized without the collaboration and agreement of the interested associations of pharmacists

"III That fees for persons in moderate circumstances should be reduced, taking into consideration living conditions in each country

"IV That associations of pharmacists, wholly interested in compliance with the established tariffs and in the careful compounding of prescriptions, should be organized to assume proper technical control of this work and in the observance of the professional oath

"V That there should be established an impartial board for arbitration and the prevention of differences that might arise between organized pharmaceutical services and individual pharmacists

"VI In consideration of the faithful collaboration of organized pharmaceutical services, all laboratories with pharmaceutical workers established by social insurance agencies and similar organizations, should be prohibited in those places where organized pharmaceutical services exist "

(6) *Medico-Pharmaceutical Combinations*—Upon the motion of Pharmacist Breugelmans of Brussels, the following was adopted

"Since medicine and pharmacy are professions based on different university training, the pharmacist alone is qualified to perform pharmaceutical work Pharmacy is a profession of the greatest public utility and of the greatest possibilities, it should therefore be encouraged in regions where it does not flourish Pharmacy should justify its existence legally, scientifically and morally, so that it cannot be replaced by a depot of medicaments dispensed by a physician or by any person outside of both professions That combinations of medicine and pharmacy must be considered as detrimental in all places where there is a registered pharmacist That license for the practice of medicine combined with the dispensing of drugs must be strictly regulated and in

such manner as to prevent or restrict all operations for profit by the collusion of the two professions "

(7) *Uniform Laws in All Countries Regarding the Sale of Drugs*—Upon the motion of Pharmacists H Portisch, O Hoyer and F Schweder of Vienna, the following resolutions were adopted

"I That a definition of the word 'medicament' be required as preliminary to every law concerning the healing art

"II That the word 'consumer' must be limited and defined

"III That the 'distributor' be no other than a pharmacist, and that no person be interposed between the producer and consumer who is not a pharmacist

"IV That, with the exception of a few dietetic products, the sale of medicaments be limited to pharmacists

"V That the production (manufacture) of drugs be reserved to pharmacists or to authorized institutions conducted by pharmacists

"VI That the sale of specialties and drugs by wholesale dealers be limited to authorized pharmacists

"VII That the production of drugs be in normal amounts as superproduction is an actual danger to the public "

(8) *The Organization of Military Pharmacists in European Countries*—Upon the motion of Pharmacist Barthet of France, the following was adopted

"That the British delegates to this Congress present to their government a report on the organization of military pharmacists in Europe, Great Britain being the only European country that does not have military pharmacists "

(9) *Inspection of Pharmacies in Various Countries*—The following conclusions by Pharmacist C J Ravaud, of France, were received and transmitted to the International Pharmaceutical Federation for study

"I Inspection of pharmacies is absolutely indispensable for the preservation of public health

"II It should not be limited only to technical control, but also should comprise detection and prosecution of illegal practices

"III Such inspection should be entrusted to pharmacists chosen from among professors of the schools or faculties of pharmacy or from among recognized practitioners skilled in inspection

"IV That the inspectors should be appointed directly by the government, that they should be permanent and have extensive powers to enable them efficiently to perform their duties

"V It is desirable that government authorities be assisted by a Consultative Council representing various elements of the pharmaceutical profession of the nation "

(10) *A New System of Pharmaceutical Education*—Upon the motion of Dr of Medicine and of Pharmacy Alexander Moszonyi of the University of Budapest, the following was adopted

"In each country where it is necessary, the International Pharmaceutical Federation should envisage a restriction in the number of pharmacists trained, in accordance with national exigencies "

(11) *The Rôle of Pharmacists in Civilian Defense against Gas*—Upon the motion of Prof Wester of Holland and Pharmacist Weil of Brussels, it was resolved

' That the XII International Congress of Pharmacy, recognizing the services rendered in all countries by pharmacists in defense against chemical warfare, expresses the following requests

' I To Universities To enlarge their courses in analytical chemistry, toxicology and bromatology by more thorough study of war poisons, and that the faculties of pharmacy organize courses for supplementing the knowledge of persons who received their diplomas from said universities in the past

"II To National Red Cross Societies That an important place be reserved for pharmacists in educating the population (courses of instruction for litter-bearers), in the study of means of passive defense applied to aid for victims, and in the mobilization of the Red Cross

' III To Governments That national and regional organizations utilize on a large scale the skill of pharmacists for which their studies particularly qualify them, in the general organization for the detection of gas, disinfection and inspection of gas masks, management of shelters and the conservation of chemical and pharmaceutical products "

(12) *Methods of Elaborating Pharmacopœias*—Upon the motion of Pharmacist Van Huffelen of the Society of Pharmacy of Antwerp the following conclusions were recommended, but not adopted

"I Since for major reasons, pharmacists are included in the commissions on pharmacopœias, it is hoped that all governments will adopt measures necessary to assign to such work, practicing independent pharmacists

"II Since the contact between pharmacopœia commissions and the organized pharmacists must be maintained not only before but also during the elaboration of and preparation of new additions of such pharmacopœias,

"III We recommend that various governments bring home to physicians the importance of a knowledge and use of the most recent edition of the pharmacopœia "

(13) *An International Pharmacopœia*—Prof van Itallie offered the following considerations on Pharmacist Van Schoor's (Antwerp) recommendations Prof van Itallie's recommendations were adopted by the Congress as follows

"The Sixth general meeting of the International Pharmaceutical Federation, held at The Hague, September 6 and 7, 1927, accepted, without discussion, the following proposition

"I The general meeting shall nominate a commission composed of seven members charged with presenting a report on the possibility of publishing a restricted international pharmacopœia

"II This commission will forward its report within the next six months to the bureau of the Federation The latter will present it to the Belgian Government and to the Hygiene organization of the League of Nations

"The full report of this commission, of which Prof van Itallie was *president* and A Schamelhout *secretary*, was published in Bulletin No 1, 1928, pp 11-20 It was addressed to the above authorities Up to the present time we have not heard whether any resolution or decision has been reached on this report

"The Brussels Conference of 1925 on heroin derivatives asked for the appointment of two commissions by the League of Nations, one to determine methods of analysis, the other for the study of galenic medicaments These two commissions have not yet been created Of the persons recommended for places on these commissions some are no longer with us and new members should be designated by duly constituted organizations The needs that brought forth our report in 1928 still exist, and the recommendations are renewed

"With a sufficient desire a restricted international pharmacopœia may be elaborated in time "

(14) *Abolition of Restrictions on Narcotics*—Dr of Pharmacy Chieffo of Rome reported that "Legislation is very different in various countries As concerns a system of regulation the pharmacist should demonstrate sufficient moral qualities to prevent his being compromised as to the improper dispensation of narcotic drugs Limitation of production of such drugs is suggested as the only means of preventing abuses "

The report was submitted for consideration to the International Pharmaceutical Federation

Important Points on Which No Agreement Was Reached

These have been mentioned in the last paragraph, being chiefly recommendations of various delegates that were not passed by the Congress

Publications—The Secretary General of the Congress promised that minutes would be sent each delegate who had subscribed the required fee I did so, but so far no minutes have come to hand The only available publication of the Congress is the program issued in advance, which is transmitted herewith

Part Taken by the American Delegation—The writer, the only American delegate not being a pharmacist in any sense of the word, was able to take no very active part in the sessions For interest he inquired of the representatives of a number of other countries to ascertain if physicians were among their number As far as he could learn he was the only physician of the Congress, except certain men who held degrees in both medicine and pharmacy or one of its branches

The writer who is Librarian of the Army Medical Library, was able to discuss the matter of scientific publications and their cost That the Army Medical Library, the largest medical

library in the world, indexes articles from journals of pharmacy in its *Index Catalogue*, the world's standard of bibliography in the medical sciences, was a matter of pride to the pharmacists of other nations. A number of delegates promised to send material as a gift to the Army Medical Library, and some of this has been received.

Action Taken by the Conference with Regard to Future Meetings—There is no question as to the continuance of the International Congresses of Pharmacy, which have a fixed place particularly in European countries. Article IX of the Rules of the Congress require the final session to select and announce the date and place of the next Congress. The President, however, announced that though more than a dozen countries had extended invitations for the next meeting, it was deemed advisable to give the matter further thought. It was therefore voted that the place and date of the next Congress would be left to the Committee of the International Pharmaceutical Federation (*Fédération Internationale Pharmaceutique*).

General Comment Importance of the Conference—The Congress was a worth-while gathering of some of the world's best scientists in the field of pharmacy in the European sense of the term, that is, the broad topics of chemistry (inorganic, organic and physiologic), pharmacology, bacteriology, serology, biology etc. There was nothing in the conference that pertained to pharmacy as the mere compounding of drugs. The problems of the production of medicinal plants, the mining or other acquisition of inorganic compounds, the manufacture of biologicals, the testing of these various products, were considered. The representatives of most of the European countries were professors at the several universities or research institutions. But little attention was paid to the purely commercial side. The general subject of costs of manufacture was discussed in passing, but only in relation to its bearing on pure science. In other words the meeting was unlike what in this country would be expected at a meeting of certain pharmaceutical associations.

The meeting is believed to have been an important one. From conversations with delegates from other countries I gained the impression that the International Congresses of Pharmacy are held to be among the most important of gatherings of scientific men. Again and again the opinion was expressed that the United States might add much to the meetings by sending professors from the leading universities, men who could present America's views in these fields. In this country, as far as I have been able to learn, there are no scientific bodies comparable to this International Congress. Here to bring together men of these varied interests it would be necessary to have a joint meeting of pharmacologists, chemists and bacteriologists.

One striking difference in the functions of the pharmacist in Europe and in this country is seen in the status of the pharmacists in the Continental armies and that of the United States. In the United States Army the term pharmacist implies merely a trained enlisted man capable of compounding prescriptions. In Europe it means a highly educated professional man. The European Armies nearly all have Corps of Pharmacists distinct from the Medical or Administrative Services. In our Army much of the work that the pharmacist officers do in Europe is performed by medical officers. This includes the routine diagnostic laboratory procedures, general sanitation, and to a limited extent the production of biologicals.

The American delegate quitted the Congress with the feeling that it is to the advantage of the United States to be represented at future International Congresses of Pharmacy. They are old and well-established meetings and much valuable information is to be had by those attending, particularly by personal contacts. Some of our distinguished authorities in pharmacology and pharmacy would be able, on the other hand, to add much to the meetings.

Since the meetings are conducted in French, it seems highly desirable that persons attending the Congress be familiar with that language. Those without a knowledge of French might enjoy the social functions but would get little out of the scientific sessions, and also be unable to discuss matters of common interest with delegates from other lands.

Miscellaneous—There were a large number of social events in connection with the Congress. The King and Queen of the Belgians attended the opening session. (The closing paragraph of the report is largely concerned with conditions and entertainments and therefore omitted.—*Editor*.)

INTERNATIONAL PHARMACEUTICAL FEDERATION

The officers of the International Federation are *President*, Dr J J Hofman, The Hague Holland, *General Secretary*, Dr Potjewijd, Leyden, Holland, *Secretary* Oscar Van Schoor, Antwerp, Belgium

A communication has been addressed to the ordinary members of the International Pharmaceutical Federation in which it is stated that a letter had been transmitted to the authorities of the Countries represented in the 12th International Congress of Pharmacy, containing the conclusions on certain questions which were discussed by the Professional Section and it is suggested that if the problems presented are of interest to the Countries represented that the governmental authorities be asked to study the conclusions arrived at

The communication received is signed by President J J Hofman and General Secretary T Potjewijd under date of November 28 1935 It is addressed to the *Minister of Hygiene and Public Health* Another letter follows to the ordinary members of the International Pharmaceutical Federation and to co members

Charles H LaWall was appointed delegate to the meeting of the International Pharmaceutical Federation and to the 12th International Congress of Pharmacy held in Brussels July 30 to August 5, 1935 Conditions over which the appointed delegate had no control made it impossible for Professor LaWall to attend

Major Edgar Erskine Hume, Medical Corps, United States Army, was the only delegate of the United States present, but not officially designated a representative of the AMERICAN PHARMACEUTICAL ASSOCIATION He has submitted a report on the 12th International Congress of Pharmacy to the AMERICAN PHARMACEUTICAL ASSOCIATION for publication in the JOURNAL It precedes

COMMUNICATION TO THE MINISTER OF HYGIENE AND PUBLIC HEALTH

'The 12th International Congress of Pharmacy which has held a convention at Brussels from July 30 to August 5, 1935, has entrusted the International Pharmaceutical Federation, with headquarters in The Hague, with the mission of transmitting the decisions of the Congress to the Governments of the 29 Nations which participated in the Congress and are represented in the International Pharmaceutical Federation

"It is in pursuance of this mission and to comply with obligations formally placed upon us that we have the honor, Mr Minister, to transmit to you expressions of opinion on three questions which are under the direct supervision of your Department

"These three questions are of great interest for all the Countries spoken of above

"For this reason we have decided to group all three in order to bring the expression of our views to the knowledge of the Governments having members in the International Pharmaceutical Federation

"In consequence, Mr Minister, we have the honor to call your attention very particularly to these views They were discussed at length and conscientiously before their adoption, which was by the unanimous vote of the members of the Congress present at the sessions of Wednesday, July 31st and Friday, August 2nd

"We are asking our members and affiliates of your Country to see that you also receive the reports upon which the resolutions adopted by our meetings were based These reports, which are concise and drawn up in accordance with the regulations of the Congress, give only a general idea of a doctrine familiar to us as professional persons but are sufficient to justify the views expressed by the Congress of which the following is a textual statement

"*First Question* — Adoption of uniform laws in all countries tending toward a rigorous regulation of commerce in medicaments

"1 That the definition of the word medicament is necessary as a preliminary of any law concerning itself with the healing art

"2 That the word consumer should also be equally well defined and limited

"3 That the distributor cannot be any other person than a pharmacist no other person than a pharmacist shall be permitted to interpose himself between the producer and the consumer

"4 That the sale of medicaments, with the exception of certain dietetic products, shall be reserved to pharmacists

"5 That the production (manufacture) of medicaments should be reserved to pharmacists or to institutions enjoying previous authorization and directed by pharmacists

"6 That the sale of medicaments and specialties by wholesalers should be limited to sale solely to authorized distributors, namely, pharmacists

"7 That the production of medicaments should be held to normal requirements, as over-production constitutes a real public danger

"*Second Question* Duplication of Professions —Believing that medicine and pharmacy are two separate professions, requiring different university preparation

"That the pharmacist alone is qualified to exercise the profession of pharmacy,

' That pharmacy is a profession of public utility and that its diffusion in regions now deprived of it is necessary in as large a degree as possible,

"That pharmacy justifies its existence legally scientifically and morally, and cannot be replaced by a depot of medicaments attended by a physician or by some person belonging to neither of the two professions,

"That the union of the practice of medicine with a pharmaceutical depot should be considered as an abuse in any locality where there is a regularly established pharmacist,

"That the license to practice medicine, joined with that to deliver medicaments, should be strictly regulated everywhere in order to prevent or prohibit any operations for profit which may be realized by the union of the two professions into one

* "Accordingly The desire is expressed that the limitation and separation of the two professions should be provided for by law, in accordance with the professional groupings and with a view to the interests of the public health

' *Third Question* —Control of specialties and regulation of sale price

"1 Pharmacy should be corporatively organized in order to safeguard the professional scientific and economic interests of its members

"2 In view of the excessive development of pharmaceutical specialties, the organized profession of pharmacy should take collective action to have the pharmacist permitted to assume the obligation of analytical control of specialties, according to the legal requirements in force in each country

"3 Having assured the observation of professional obligations in this respect, the organized corporation should provide that the monopoly of sale of the specialty and a normal profit in such sale be respected

"4 In the present state of the knowledge which can be acquired at universities in most countries, the pharmacist can only be assured of chemical control of specialties

"5 From the fact that the pharmacist has not received the desired preparation in these countries to enable him to effect, competently control of biologic, opotherapeutic or other compositions necessitating a clinical test recourse should be permitted upon occasion to qualified assistants to be chosen from university graduates who have specialized as pharmacodynamists or biologists, and who have their diplomas as such

"6 In view of the enormity of the task, there should be created a sufficient number of chemico biological laboratories, which will be specialized in view of the multiplication of collaborations made necessary by the division of labor

"7 These autonomous laboratories will function by the initiative of the organized profession and under the supervision of the Government The Government, unable in law to assume any responsibility for the seller, is qualified to stimulate and encourage private initiatives acting in conformity with the requirements of the public health

"8 The organized profession of pharmacy will undertake to create, equip and rent its control services, levying a light tax on the interested parties to compensate itself in some measure for its pecuniary outlay

"9 The Government will require control of all specialties, prior to their registration, by the services of the corporation, in order to assure the conformity of such specialties to their formulas and to legal requirements in regard to their preparation conservation, etc

"10 In the meanwhile it is urgently necessary to strive for modifications in university courses in pharmacy, wherever it may be necessary, in order that graduates may receive a pharmaceutical diploma enabling them to exercise biological control, after instruction and a practical laboratory course in competent institutions

We express the hope, Mr Minister, that you will give our communication your attention and that you will recognize the public interest in the above propositions, all of which are in absolute conformity with the interests of the public health

Requesting you to receive Mr Minister, the assurance of our great consideration,
' For the International Pharmaceutical Federation,

The Secretary,
T POTJEWIJD

The President,
J J HOFMAN "

Letter to the Ordinary Members of the International Pharmaceutical Federation

Leyde November 28, 1935

Gentlemen and Honored Co members

We are enclosing a letter which we have sent to the Authorities of the Countries represented in the 12th International Congress of Pharmacy

As you will see from this letter it contains the conclusions on certain questions which were discussed by the Professional Section

If you consider these problems to be of interest to your Country, we suggest that you urge your governmental authorities to study the conclusions arrived at here

Please accept, Gentlemen and Honored Co members, the assurance of our most sincere esteem

The Secretary General
(Signed) T POTJEWIJD

The President,
(Signed) J J HOFMAN



Courtesy of Northwestern Druggist

This group picture was taken on the occasion of the visit of Dr Robert Eder to the College of Pharmacy, University of Minnesota Lower row, seated Left to right—Dean Frederick J Wulling, Dr Robert Eder, director of the Institute of Pharmacy, Zurich Switzerland, Dr Isaac Kolthoff professor and chief of the Division of Analytical Chemistry U of M Standing, left to right Professor Charles H Rogers Pharmaceutical Chemistry and Food and Drug Analysis Professor Earl B Fischer Pharmacognosy and Materia Medica, Professor Gustav Bachman Pharmacy and Dispensing

S 3084 PHARMACY

The bill referred to under title was introduced by Senator Copeland and discussed at Portland by the A P H A A A C P and N A B P It is considered a basis for a model pharmacy law and it is suggested that legislative committees obtain copies for consideration R L Swam discussed the measure and speaks of it as a sane and deliberate approach to better legislation controlling the sale and distribution of drugs and medicines and builds greater safeguards around the practice of pharmacy "

OBITUARY

FREDERICK WILLIAM MEISSNER

Frederick William Meissner, of La Porte, Indiana for many years active in the AMERICAN PHARMACEUTICAL ASSOCIATION and a regular attendant at its meetings died December 7th aged 76 years. The following brief biographic sketch is taken from the records of the Chicago Veteran Druggists' Association (1930) of which Mr Meissner has been an associate member since 1909.

"Frederick William Meissner was born in La Porte Indiana, December 5, 1859, he received his education in the public and private schools of that city and began his pharmaceutical career October 13, 1874, taking a position with Dr Eliel Sons. In 1878, due to ill health he went West and in Denver, Colorado took employment with the Huyck's Drug Store. Returning to La Porte in 1879 he again engaged with Dr Eliel Sons until they sold the pharmacy to Dr A U Morris.

"In 1881, he was employed with H K Metcalf & Co 172 N Clark St, Chicago. In the spring of 1882 he returned to La Porte and in association with J H Henry Kuehne took over what had been one of the branch stores of the Dr Eliel Sons and conducted the same under the firm name of Kuehne and Meissner until the spring of 1886, when Mr Meissner disposed of his interest in the firm and entered Philadelphia College of Pharmacy from which he was graduated in 1888. In the fall of the same year he opened a new pharmacy in La Porte, and has conducted the business continuously in the same location up to the present time."

Mr Meissner was a former member of the U S P Board of Trustees, served as president of Indiana Pharmaceutical Association was one of the organizers of the National Association of Retail Druggists and member of its Executive Committee. He served on the Auxiliary Committee of the National Formulary V. He joined the AMERICAN PHARMACEUTICAL ASSOCIATION in 1890 and was chairman of the Section on Commercial Interests 1901-1902. For a number of years he was president of the La Porte City School Board.

The deceased is survived by his widow who accompanied her husband to many of the annual meetings of the A P H A.

ANTOINE EDWARD GREENE

Antoine Edward Greene, professor of Pharmacy at Howard University College of Pharmacy, Washington, D C, died November 30th, aged thirty three years.

Professor Greene was born in Cambridge, Mass, son of Charles and Annie E Greene. He graduated from Massachusetts College of Pharmacy in 1922 and attended Massachusetts Institute of Technology in 1923, 1925 and 1926, in 1924, he was a student at the University of Paris (France). In 1922 he was appointed assistant in Bacteriology, under Dr Algernon B Jackson School of Medicine, Howard University. January 1924, he was named instructor in Theory of Pharmacy and Associate Professor of Pharmacy in 1926, which position he held at the time of his death. He attended the Summer Sessions at the University of Michigan, College of Pharmacy, 1929-1930, and at the University of Wisconsin, 1932-1933.

Professor Greene was a member of the AMERICAN PHARMACEUTICAL ASSOCIATION since 1930, and during these years contributed a number of papers, published in the Scientific Section of the JOURNAL and in the Department of American Association of Colleges of Pharmacy.

James H Breasted, the noted Orientalist and Egyptologist who passed away December 2nd, was at one time engaged in pharmacy, he graduated in 1886 from the Chicago College of Pharmacy—the College of Pharmacy of the University of Illinois.

John B Michels, El Paso, Illinois, a former president of the Illinois Pharmaceutical Association and for many years Mayor of his own city, died December 5th.

DEATH OF FORMER PRESIDENT L L WALTON

L L Walton, president of the AMERICAN PHARMACEUTICAL ASSOCIATION, 1925-1926 died December 26th, following an illness extending over a period of several months, he had been in poor health for a year or more. Sympathy is expressed at this time and a sketch will appear in the January number of the JOURNAL.

PERSONAL AND NEWS ITEMS

Wishes for a Successful 1936

H K Mulford was tendered a dinner at the Union League on October 31st, by the National Drug Club in honor of his completion of 50 years in pharmaceutical work

C C Harris, of Houston, has resigned as *President* of Texas Pharmaceutical Association B B Brown, of Dallas, is the *First Vice President*

Martin E Adamo, a fellow-member has been appointed a member of the Advisory Board of the Division of Immigration and Americanization, under the Department of Education

Among the highlights of the National Drug Trade Conference were Endorsement of fair trade legislation, fair trade enabling act Cope land bill, collection and compilation of evidence relating to harm or danger to public health in the present system of distributing medicines at retail

Dr Raymond A Pearson, former president of the University of Maryland has been appointed special assistant to Rexford G Tugwell

Officers of Ohio Valley Druggists' Association are *President*, Philip A Schwartz, *Vice-President*, Chester A Lathrop, *Secretary*, Stanley Roth, *Treasurer*, Otto E Kistner

Members of the AMERICAN PHARMACEUTICAL ASSOCIATION were ably represented at the St Louis meeting of the American Association for the Advancement of Science and several of the papers received front page recognition in the press Among the latter, papers by John C Krantz, Jr, C Jelleff Carr, Ruth Musser, William Harne James C Munch, Theodore Koppányi, James M Dille Charles R Linegar No doubt others of those mentioned on page 943 of the November JOURNAL received related mention, but at this late day their contributions did not come to this writer's attention

The Texas Centennial will open at Dallas, June 6th Here in August the 84th meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION will be held

BOOK NOTICES AND REVIEWS

A Text-Book of Medical Jurisprudence and Toxicology By JOHN GLAISTER, MD, DPH, FRSE, in collaboration with JOHN GLAISTER, JR, M B, CH C, MD DSc Fifth edition Published by William Wood and Company New York City, 1931, xv + 954 pp, 132 illustrations and 7 plates \$10 00

Glaister has been an authority in medical jurisprudence and toxicology for the last half century in England American students are probably less familiar with this authority The first sixteen chapters of the fifth edition deal with medical jurisprudence the various British laws and Scotch criminal procedure nature of evidence identification pathological changes in drowning, hanging, electrocution exposure, apoplexy and following various types of wounds, blood stains and identification pregnancy abortion, infanticide drunkenness and lunacy A very large number of case reports are presented to illustrate various phases of medical jurisprudence and 117 figures set forth various features Photomicrographs of various types of hair, post-mortem appearances following wounds methods of identity by finger prints are clearly illustrated

The second section deals with toxicology definitions of poisons poison schedules, the Dangerous Drugs and the Therapeutic Substances Acts and the procedure to be followed in cases of suspected poisoning The last three chapters deal with irritant poisons, arsenic phosphorus various halogens, the opium alkaloids, cannabis, cocaine and a number of vegetable alkaloids A portion of the last chapter discusses food poisoning botulism, snake bites, stinging fishes and arrow poisons The world tolerances for arsenic are discussed but the Manchester Beer poisoning receives only brief mention Characteristic responses from exposure to toxic doses of various poisons as well as abstracts of a number of legal cases of murder with various types of poison (Crippen, Smith, Lyons McCracken Cotton, Cross etc) are described in some detail This will prove a very helpful book for analysis and legal presentation of toxicology —JAMES C MUNCH

The Seventh American Scientific Congress was held in Mexico City September 8th-17th, in the Palace of Fine Arts It was opened by the President of the Republic of Mexico Various American countries were represented by delegates The work of the sections was divided into physical and methodical sciences, geology engineering and industrial chemistry agricultural sciences, biological sciences, medical sciences, hygienic sciences, anthropological and historical sciences, social and economic sciences, and bibliography Indianism juridical sciences

A number of interesting papers were read and the AMERICAN PHARMACEUTICAL ASSOCIATION was represented by Guillermo G Colin and Manuel Donde Gorozpe.

INDEX TO AUTHORS

(Some reports, etc., are not listed in Authors' Index but will be found in the Subject Index under Reports Abstracts Personal Items etc.)

- Adamson R S
Tests for Redistilled Water in the N F VI Mono
graph 800
- Ajax Charles G
The Pharmacist Studies Law 863
- Albers C C
Botany Course as a Foundation for the Pharma-
cognosy of Stem and Bark Drugs 310
- Ambroz W F
Pharmacist and the Podiatrist 774
- Andrews Marvin J
Determination of the Reasonable or Permissible
Margin of Error in Dispensing V Liquids, 477
- Arny H V
Pharmaceutical Practice discussion 813
Report Committee on Pharmaceutical Research
A Ph A 520
(See Association Business and Subject Index)
- Baker Wm B
Address—Standardization of Aconite Preparations
70
- Baldinger L H
Continuous Reading Titration Apparatus 6
Suggested Formula for White Liniment 130
- Ballard C W See New York Branch A Ph A and
Section Education and Legislation
- Barger G
Lecture—Ergot 189
- Bauer John C
Urinary Analysis and Diagnosis review of 241
- Beal George D
Carbo Activatus 630
Study of the U S P Thyroid Assay 742
(See Abstracts U S P)
- Beal James H
Report of Committee on Endowment Fund 918
The Pharmacopœia of the U S and the Federal
Food and Drugs Act 759 810
(See Association Business)
- Beard J G
Report of the Committee on National Pharmaceu-
tical Syllabus 911
- Bibbins F E
Report
Board of Review of Papers 996
Delegate of the Scientific Section 920
Secretary Scientific Section 996
Solution of Cresol Compound—the Variation of
Phenol Coefficient when Different Oils Are Used
for Saponaceous Base 1077
Tincture of Opium 964
- Bishop Dr Louis F Jr Address Coronary Artery
Disease 1104
- Bizzari Ada J
Report as Secretary St John's University Student
Branch 327 424
- Bliss A Richard Jr
Comparative Study of the Absorbability of Six
Calcium Compounds 280
- Bowers Harold R
Analysis of Magnesium Carbonate 128
- Bowman Neal B
Place of Commercial Subjects in the Pharmacy
Curriculum 987
- Bradley T J
Notice from Committee on Transportation 182
308 350
Report of the Committee on Transportation 912
1026
- Brady Charles E
Sulphur Ointments and Their Assay 945
- Braker W
Local Anesthetics Phenyl Procaine 358
Sulphide Analogues or Azo Dyes Having Bacteri-
cidal Properties 607
- Brew Marjorie
Value of Tolu Coating U S P X and N F V 291
- Briggs W Paul
Pharmacy Theory of and Academic Standards 153
- Britt Lewis C
Chemical Study of Sulphur Ointment 854
- Brolmeyer E C
How to Help the Pharmacist Commercially 861
- Bryce David
Address Medicinal Dyes 241
- Bukey F S
Comparative Study of Enteric Coatings 567
Value of Tolu Coating U S P X and N F V 291
- Burlage Henry M
Address as Chairman Section on Practical Pharmacy
and Dispensing 1002
Comparison of Four Year Curricula in Pharmaceu-
tical Subjects 228
Sulphur Ointments and Their Assay 945
Theory of Pharmacy and Academic Standards 156
- Burns P L
Solution of Cresol Compound—the Variation of
Phenol Coefficient when Different Oils Are Used for
Saponaceous Base 1077
Tincture Opium 964
- Byers George E
Report as Secretary Philadelphia Branch A Ph A
498 522 1032 1105
- Campbell W G
Vitamin A and D Products 429
- Carr C Jelleff
Note on Assay of Mass of Ferrous Carbonate 948
Report as Secretary Baltimore Branch A Ph A
70 72 232 315 420 1027 1100
Study of the Anesthetic Properties of Trichlorethyl-
ene 754
- Chamberlin Neil T
Report as Secretary Northern Ohio Branch 76 423
1032
- Chen K K
Cyanide Poisoning and Its Treatment 625
Question of Assaying Ergotocin the New Ergot
Principle 834
- Christensen H C
Department of N A B P 872
Report of Pharmacy Exhibit for 1933-1934, 1018
(See Association Business)
- Christiansen W G
Comparison of Spectrometric Method for Antimony
Trichloride Test for Estimation of Vitamin A Po-
tency 1072
Local Anesthetics Phenyl Procaine 358
Preparation and Properties of 3,3' Bis(Azometa-
Phenylenediamine) 4,4' Dihydroxyarsenobenzene
and 3,3' Bis(Azo 2,6 Diaminopyridine)-4,4'-Di-
hydroxyarsenobenzene 457
Preservation of Halibut Liver Oil with Hydro-
quinone 465
Shark Liver Oil 295
Study of a New Series of Urethanes 22
Study of Germicidal and Antiseptic Activity of
Mercury Compounds 386
Sulphide Analogues of Azo Dyes Having Bactericidal
Properties 607
Therapeutic Substances Derived from Unsymmetrical
Diphenyl Compounds III Some Aryl Esters of
the Hydroxy Diphenyls 553
- Cimara Dorothy Report as Secretary St John's
University Student Branch 1106
- Clark A H
Potassium Guaiaccol Sulphonate 564
- Clark, R W
Dutric Acid 843
National Food and Drug Legislation 490
Report of Section on Practical Pharmacy and Dis-
pensing 922
- Clayton C J
Report of Conference of Pharmaceutical Association
Secretaries 922
- Cloves G H
Cyanide Poisoning and Its Treatment 625
- Cook E F
Abstract of Proposed Changes U S P with New
Standards and Descriptions 11th Revision 716
784 787 878 882
Daphnia the Biological Reagent 1000
New Pharmacopœia 1050 1098
New U S P X Interim Revision of Ergot Assay 5
Report of the Special Committee on the Council on
Pharmaceutical Practice 811
Report on U S P 11th Revision 796

- Cook E S
Stability of Diothane Solution II, 269
- Cook Roy B
(See Association Business)
- Costello P H
Address 818
Membership 736
Report of Committee on Weights and Measures 1022
(See Association Business)
- Cousins Margaret
Purple Cloud 250
- Cox C I
Report as Secretary Northern New Jersey Branch 162 522 1032
- Dargavel John W Letter Commending Work of E F Kelly 1111
- Darling Ira J
California Fair Trade Act 981
- Davy Edward D Improvement in Technique in the Preparation of Three Common Products 1079
- Defendorf J H
New Leg Vein and Intramuscular Guinea Pig Method 276
Studies on the Bioassay of Digitalis 276 369
- Delgado Frank A
Address Prescription Department Economics—Some High Lights of the Revised Edition of the Professional Pharmacy, 815
(See Association Business)
- Dille James M
Studies on Barbiturates XI Further Contributions to Methods of Barbituric Research 847
- Doak G O
The Arsenamides Compounds Containing the As-N Linkage 453
- Drake Miles E
Some Pharmacological and Bactericidal Properties of Umbellulone 196
- DuMez A G
Bibliography of Pharmaceutical Research 40 117 167
Personnel Changes in Swedish Pharmaceutical Circles 823
Pharmaceutical Abstracts (page 1 March issue) 1 33 69 105 141 177 213 253 293 333
Report of Committee on Education and Legislation (Baltimore Branch) 71
Publications 684
YEAR BOOK 685
Report of Committee on Pharmaceutical Nomenclature 911
(See Association Business)
- Dunker Melvin F W
Assay for Phenol in Official Preparations 840
- Dunn Marin S
Statistical Study of Records of Same Class in Botany and Pharmacognosy 991
- Dunning H A B
Report of Committee on Maintenance A Ph A 808
(See Association Business)
- Durham O C
Address Allergy from the Standpoint of the Manufacturer and Pharmacist 72
- Dyniewicz H A
Study of Vehicles for Medicines 46
- Dyniewicz J M
Study of Vehicles for Medicines 46
- Eberle E G
(See Editorials and Editorial Notes)
Annual Survey of American Chemistry review of 439
Annual Survey of Research in Pharmacy 1933-1934 and Proceedings of National Conference on Pharmaceutical Research 177
Bill for Extending Life of NRA 261
Blue Eagle and NRA 537
Contributory Professional Service 536
Deductions from Papers of A Ph A 832
Diehl C Lewis 1049
Drug Jars in New York Museum 184
Education of Public in Fair Trade Practices 832
Educational Value to Be Derived from Travel to Conventions of A Ph A 739
Eight International Congress of Military Medicine and Pharmacy 444
Eighty Fourth Annual Meeting of A Ph A 606
First Aid Week 94
Hospital Distribution and Hospital Service 261
International Congress of Military Medicine and Pharmacy 348
International Congress of Pharmacy 183 444
- It Is Doing as Well as the Aims and Purposes 740
- Japanese Pharmacopœia Commission 943
- Law of Drugs and Druggists 439
- Law of Patents for Chemists 439
- Limitation of Number of Pharmacists 942
- Narcotic Drug Traffic 94
- National Formulary 1048 1051
- New U S P X Interim Revision of Ergot Assay 5 New Year 4
- Pan American Medical Association 183
- Pharmacist in Literature and the Museum of the AMERICAN INSTITUTE OF PHARMACY 348
- Pharmacists and Public Health Service 445
- Pharmacopœia and N F 941 1050
- Portland Meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION 604
- Prescription Department 740
- Relative Positions in Materia Medica of Inorganic Synthetic Organic and Natural Organic Substances 833
- Report of Historian 1014
- Rice Charles 1049
- Sculptural Panels of AMERICAN INSTITUTE OF PHARMACY 936
- Service Library 95
- Signs of Progress of Pharmacy 4
- Sixth International Congress of Military Medicine and Pharmacy 260 444
- Spalding Lyman 1049
- United States Pharmacopœia 1047 1049
- Variation in Contributory Harmfulness of Petroleum 261
- Bells Walter Crosby
Center of Population of Pharmaceutical Education 1870-1930 868
- Emmatt Emily Walcott
The Badianus Manuscript an Aztec Pharmacopœia 771
- Eppson Harold
Preliminary Chemical Examination of Corydalis Aurea 113
- Evans C H
Address as President of the N A B P 673
- Éwe George E
David Henshaw—from Druggist to Secretary of the Navy 858
- Fantus Bernard
Study of Vehicles for Medicines 46
- Felter F C
Green River Peddling Bill 1009
Symposium on Prescription Pricing 816
- Fiero George W
Content of a Pharmacognosy Course 1095
Visible Prescription Department 973
- Fischels R P
Action on Recommendations of 923
Address as President of the A Ph A 635
Federal Drug Legislation Must Not Be Permitted to Die 349
Pharmacy and the Public Health Radio Address 927
Recommendations 653
Report as Delegate to National Drug Trade Conference 913
Report of Committee on Study of Pharmacy 912
Report of Committee on Weights and Measures 935
(See Association Business)
- Fischer Louis
Leaf Oils of Washington Conifers VII Juniperus Occidentalis 613
- Fischer Paul
Drug Extraction IV The Effect of Variation in Solvents on the Extraction of Jalap 615
- Forsee W T Jr
Acyl Derivatives of Ortho Aminophenol 363
- Foulk Martha E
History of Dentifrices 975
- Fuqua R S
Report of Committee on Science and Practice of Pharmacy 71
- Gardner Roy
Australian and New Zealand Association for the Advancement of Science 833
- Garlough F E
Antudotes I General Plan 38
Application of Statistical Methods to Pharmaceutical Research IV Methods of Recording Drug Action 619
- Gathercoal E N
Report on National Formulary 689 1051
Tests for Redistilled Water in the N F VI Monograph 800
(See Association Business)

- Gault Edgar H
Address The Ethics of Modern Advertising 437
- Gershenfeld Louis
Comments on Paper by Professor Antoine E Greene
on Teaching Urinalysis to Students of Pharmacy
417
- Gisvold Ole
Phytochemical Notes 290
Sterol from *Pinus Sabiniana* 290
Sterols from *Monarda Fistulosa* 214
Sterols of *Achillea Millefolium* 1071
- Gordon Samuel M
Cooperation between Dentists and Pharmacists 136
- Greene, Antoine E
Teaching Urinalysis to Students of Pharmacy 414
- Hancock James E
Report of the Committee on Wm Procter Memorial
Fund 911 1023
- Hargreaves Chester C
Question of Assaying Ergotocin the New Ergot
Principle 835
- Harris Loyd E
Note on Action of Alkalies and Alkali Salts on Anti
pyrine 1069
- Harris, S E
Study of Germicidal and Antiseptic Activity of
Some Mercury Compounds 386
Therapeutic Substances Derived from Unsymmetri
cal Diphenyl Compounds III Some Aryl Esters
of the Hydroxy Diphenyls 553
- Harrison W E
Study of Calomel from the Physical and the Chemical
Standpoint 97 726
- Hatcher Robert A
Quantitative Determination of Alkaloids with Bro
mine 262
- Hatcher Robert L
Quantitative Determination of Alkaloids with Bro
mine 262
- Hauck Rudolf O
Report as Secretary New York Branch A Ph A
74 161 239 317 420 495 1028 1031 1102
- Henry Samuel C
Address Problems Facing the Drug Trade 430
- Hilton S L
Address Remington Medalist 926
(See Chairman of the Council and Association
Business)
- Hitchens Richard M
Assay Methods for Salts of Organic Acids 11
- Hoch J Hampton
Patent Medicines 145
- Hocking George M
Methods of Identification of the Rhizomes of Iris
Versicolor L and Iris Virginica L 17
- Hogstad Anton Jr
Mankind and Medicines 79
Pharmacy Week 257 1023 1033
(See Association Business)
- Holton, C W
Report of Treasurer 898
(See Association Business)
- Hume Edgar Erskine
Report on 12th International Congress of Pharmacy
1113-1119
- Hunt Wm H
Address The Bioassay of *Strophanthus* Prepara
tions 70
- Hurt Leon T
Golden Treasure 221
- Husa Wm J
Drug Extraction II The Effect of Fineness of
Powder and of Variation in Solvents on the Per
colation of *Belladonna* Root 446
Drug Extraction III The Function of Prelimi
nary Maceration in Relation to the Percolation of
Belladonna Root 538
Drug Extraction IV The Effect of Variation in
Solvents on the Extraction of Jalap 615
Drug Extraction V The Extraction of *Bella
donna* Root with Glycerine Menstrua 839
History of Calcium Lactophosphate Preparations
58
Stabilization of Solution of Iron and Ammonium
Acetate U S P X 125
Stabilization of Syrup of Hydriodic Acid U S P X
45
- Irizarry R L
Resolutions of the P R Association 911
- Jenkins Glenn L
Assay for Phenol in Official Preparations 840
- Assay of N F Preparations Containing Bismuth, 561
(See Book Reviews)
- Johnson, Frederick T
Pharmaceutical Study of *Ph* 397, 498
- Johnson W A
Auditor's Report 426
- Jones Rowland
Address as Chairman of the House of Delegates 656
Report of the House of Delegates 816
(See Association Business)
- Jones W S
Comparison of Spectrometric Method and Antimony
Trichloride Test for Estimation of Vitamin A
Potency 1072
Preservation of Halibut Liver Oil with Hydro
quinone 465
Shark Liver Oil 295
- Jordan C B
Address Food Drug and Cosmetic Legislation 437
Department of A A C P 61 153 227 307 413
490 577 778 868, 991 1095
Report of Committee on Prerequisite Legislation 913
- Jorgensen Paul S
Vegetable Extracts and Blood Sugar 389
- Just A E
Preparation and Properties of 3,3' Bis(Azometa
Phenylenediamine) 4,4' Dihydroxyarsenobenzene
and 3,3' Bis(Azo 2,6 Diaminopyridine) 4,4' Dihy
droxyarsenobenzene 457
- Kantner L M
Professional Outlook 134
- Kaufman, K K
Study of Compound Cresol Solution 966
- Kebler Lyman F
U S Patents Granted for Medicines during the
Pioneer Years of the Patent Office 485
- Kelly E F
Brief History of the Drug Code 787
Commended by Resolution N A R D 1110
Council Letter 64 66 164 166 329 426 508 511
512 581, 583 681 682 705 804 876 877 1034
1035 1036 1107-1112
Report of the Committee on Pharmacy Week, 911
Report of the Committee on State Codes and the
Committee on Code Matters 923
Report of the Council 894 912
Report of the Secretary 900
(See Association Business)
- Kendig E H
Report of Committee on Pharmacy Corps in U S
Army 914
- Kilmer F B
History of in the Drug Store 55
- Kirch Ernst
Potassium Guaiacol Sulphonate 564
- Klein Dr David
Address Glandular Products from the Pharma
ceutical Standpoint 76
- Klotz Lyell J
Stabilization of Solution of Iron and Ammonium
Acetate U S P X, 125
Stabilization of Syrup of Hydriodic Acid U S P X
45
- Konnerth R A
Medicine Dropper to Deliver One Minim (Apothe
cary's Measure) per Drop 856
- Koppányi Theodore
Studies on Barbiturates XI Further Contribu
tions to Methods of Barbituric Research 847
- Kramer John E
An Unusual Mortar and Pestle 574
- Krantz, J C Jr
Note on Assay of Mass of Ferrous Carbonate 948
Note on Assay of Reduced Iron 9
Pharmacy and American Association for Advance
ment of Science 942
Report of Councilor to American Association for
Advancement of Science from the A Ph A 909
Study of Anesthetic Properties of Trichlorethylene
754
- Kremers E
Phytochemical Notes 214 547 600
(See 939 1071 1112 and Section on Historical
Pharmacy)
(See Subject Index)
- Langenhahn H A
Theory of Pharmacy and Academic Standards 158
- Lascoff J Leon
Address It Can Be Done 232
Report on Recipe Book 694
- LaWall C H
Revolutionary Account Book of Christopher Jr
and Charles Marshall 302

- Study of Calomel from the Physical and the Chemical Standpoint 97 726
- LaWall Millicent R
Revolutionary Account Book of Christopher Jr and Charles Marshall 302
- Lee C O
Knowing the History of One's Profession Report Section on Historical Pharmacy 1012
Study of Compound Cresol Solution 986
- Lee Donald Kuo Chin
The Potency of Oregon Digitalis 367
- Lee John W
Accuracy and Speed Factors in Hand Filling Capsules 469
- Leech Paul N
Some Topics of Interest to Pharmacist and Physician 338
- Lehman R S
Report of Committee on Education and Legislation (N Y Branch) 73 239
(See Legislative Reports New York Branch A Ph A)
- Leonard Clifford
Personnel Changes in Swedish Pharmaceutical Circles 823
- Linegar Charles R
Studies on Barbiturates XI Further Contributions to Methods of Barbituric Research 847
- Little Ernest
Address President American Association Colleges of Pharmacy 659
How Should Fundamental Courses in Chemistry Be Taught in a College of Pharmacy 307
Let's See What We Can Do 736
- Lloyd John Thomas
History of Hamamelis (Witch Hazel) Extract and Distillate 220
- Lloyd John Uri
History of Hamamelis (Witch Hazel) Extract and Distillate 220
- Lott, Wm A
Rational of Chemo Physiological Research 162
Study of a New Series of Urethanes 22
- Lynn E V
Address as Chairman of Scientific Section 994
Leaf Oils of Washington Conifers VII Juniperus Occidentalis 613
Vegetable Extracts and Blood Sugar 389
- MacLaughlin E H
Report as Secretary Philadelphia Branch A Ph A 76 163 247
- McAllister H C
Hospital and Pharmacist 970
- McCullough, F V
Report from Indiana Association 911
- McLean A P
History of Calcium Lactophosphate Preparations 58
- Macht D I
Digitalis Assay on Normal and Exsanguinated Cats 15
- Magid Louis
Drug Extraction V The Extraction of Belladonna Root with Glycerinic Menstrua 839
- Mantz Harry W
Problems of Teachers and State Board Examiners 296
- Martin L E
Studies on Cudbear 949
- Meany Dr P T
Address Dentistry and Pharmacy 810 1087
- Meuser E N
Development of Pharmacy in West China 865
- Meyer Erich
White Mineral Oil and Petrolatum in Pharmaceutical and Cosmetic Practice 319
- Mickelsen A O
Address Prescription Writing by the Dental Profession 250
- Millet Sylvia
Assay of National Formulary Preparations Containing Bismuth 561
- Moness E
Study of Germicidal and Antiseptic Activity of Some Mercury Compounds 386
- Moore A W
Effect of Altitude on Action of Drugs I Strychnine 460
- Moore E E
Crystalline forms of Ephedrine Alkaloid 211
- Mordell J Solon
Hospital Pharmacy Practice An Innovation 50
- Morrison Robert W
Comparative Study of the Absorbability of Six Calcium Compounds 280
- Munch James C
Alkaloidal Reagents VII The Detection of Thallium 351
Antidotes I General Plan 38
Application of Statistical Methods to Pharmaceutical Research IV Methods of Recording Drug Action 619
Recent Developments in Pharmacology of Digitalis 247
Saliva Tests III Detecting the Administration of Some Opium Derivatives to Horses 557
Toxicologic Moderne review of 176
(See Book Reviews)
- Murchison Claudius T
Address Research Needs and Activities in Field by Distribution 826
- Musser Ruth
Study of the Anesthetic Properties of Trichlorethylene 754
- Newburgh Louis H
Address Drugs and Nutrition 437
- Nichols Adley B
National Formulary Exhibit at the American Medical Association Convention 520
- Nitardy F W
Medicine Dropper to Deliver One Minum (Apothecary's Measure) per Drop 856
- Noel H S
Address The Future Outlook for Financial Success in Pharmacy 1101
- Oakley Margaret
Note on Assay of Reduced Iron 9
- Overbye D A
Assay of Liniment of Camphor 951
- Pettit Joseph A
Address The Practical Value to the Pharmacists of the Activities of the Council on Pharmacy and Chemistry of the American Medical Association 810
- Philip W Bruce
Furthering Pharmaceutical Publicity through the Open or Partially Open Prescription Department 224
Profit the Way Out of the Depression 298
Report of Committee to Draft a Model Law Restricting Distribution of Drugs and Medicines 918
- Pickering Elizabeth
History of Dentifrices 975
- Pollard C B
Acyl Derivatives of Ortho Aminophenol 363
- Potterwyd T
See International Pharmaceutical Federation 1120-1122
- Purdum W Arthur
Rectal Absorption of Digitalis in Cats 374
- Reif Edward C
Pharmacology of Galinsoga 108
- Reindollar Wm F
Simplified Assay for the Official Iodine Iodide Solutions 756
- Rhodes Phyllis
Comparative Study of Enteric Coatings 567
- Rice R V
Adsorption of Strychnine Sulphate by Various Charcoals and by Lloyd's Reagent 120
- Richards Leon W
Report as Secretary Section on Practical Pharmacy and Dispensing 1004
- Rider T H
Air Lift Extractor Applied to Analysis of Alkaloidal Drug Extracts 267
Stability of Diothane Solution II 269
- Rising L Wait
Place of a Field Representative in Coöperative Professional Advertising 142
Report as Secretary Section on Education and Legislation 1008
- Rodman R W
Report as Chairman Committee on Coöperation with Hospital Pharmacists 1009
(See Section on Commercial Interests)
- Rose C L
Cyanide Poisoning and Its Treatment 625
- Rosen Harry
Address—Pyrethrum 70
- Rosin Joseph
Carbo Activatus 630
Observations on Opium Assay 1053
- Rusby H H
Russian Ergot 382

- Schuck George C
National Unity of State Cooperation between
Pharmacist Physician and Dentist 1083
Report of Proposed National Pharmacy Committee
on Professional Relations Pertaining to Dentistry
1008
Report Section on Education and Legislation 921
- Schoetzow R E
Assay of Liniment of Camphor 961
Medicine Dropper to Deliver One Minum (Apothe-
cary's Measure) per Drop 856
- Schroeder, Dr Frederick
Address Modern Medicine in Relation to Prescrip-
tion Writing 73
- Seif L D
Air Lift Extractor Applied to the Analysis of Alka-
loidal Drug Extracts 267
- Seltzer L A
F L R A Prescription Price Schedule 76
- Semb Joseph
Chemistry of Hythane and Its Solutions 547
Polychemical Study of the Seed of the Digger
Pine 609
Solubility of the Halogens in Heptane 547
- Sisby J Norman
Note on Prescription Departments 133
- Skull Dr Charles A
Lecture—Radiation and Life 250
- Smith F A Upsher
U S P Standard for Digitalis 272
- Snyder R K
Tests for Redistilled Water in the N F VI Mono-
graph 800
- Soderdahl P G
Studies on Cudbear 949
- Solomon, Simon
Report of Nominating Committee (Baltimore
Branch) 71
- Spease Edward
Pharmaceutical Practice 811
Some Observations after Twenty Five Years Ex-
perience in Teaching Pharmaceutical Mathe-
matics 227
- Struth H C
Discussion—Recent Developments in Hypnotics, 160
- Stuhr Ernst T
Drugs and Bugs 285
Foresight in Professional Pharmacy 1092
Potency of Oregon Digitalis 367
Some Pharmacological and Bactericidal Properties
of Umbellulone 196
- Suchy J F
Adsorption of Strychnine Sulphate by Various
Charcoals and by Lloyd's Reagent 120
Potent Medicaments in Sugar Coated Pills and in
Confections 1081
- Swann R L
Pharmaceutical Service in the Army 916
Pharmacy Law 1124
Report of Committee on Development of Pharmacy
Laws 920
(See Association Business)
- Swanson E E
Comparison of Six Methods in Assaying the New
Ergot Principle 998
Detoxification of Strychnine by Pentobarbital
Sodium 959
Question of Assaying Ergotocin the New Ergot
Principle 835
- Szalkowski Chester R
Carbo Activatus 630
Study of the U S P Thyroid Assay 742
- Tabern D L
Crystalline Forms of Ephedrine Alkaloid 211
Discussion—Recent Developments in Hypnotics 160
- Tebow Ercell D
Note on Action of Alkalies and Alkali Salts on
Antipyrine 1069
- Templeton L
Report as Secretary Chicago Branch 72 160 238
315 521 1028 1101
- Thompson M R
Active Constituents of Ergot a Pharmacological
and Chemical Study, 24 185
Some Properties of Ergostetrine 748
- Tice Linwood
Gelatin as a Stabilizing Colloid for Oil in Water
Emulsion Systems 1082
- Uhl Arthur H
Non Heptane Constituents of Digger Pine (Pinus
Sabuiniana) 380
- Viehoever Arno
Evaluation of Cathartic Drugs 423 1000
- Ward Justus C
Alkaloidal Reagents VII The Determination of
Thallium 351
Effect of Altitude on Action of Drugs I Strych-
nine 460
- Watts E C
Plan for Pharmacy Internships at the University of
Michigan Hospitals 852
- Werner Harold W
Volatile Oil of Hyptis Mutabilis 289
- Whitman C L
Suggestions for Improvement of Professional Rela-
tions between Dentists and Pharmacists 392
- Whitney Harvey A K
Plan for Pharmacy Internships at the University of
Michigan Hospitals 852
- Willard H H
Address Ultra Violet Fluorescence as Applied to
Problems of Chemistry and Pharmacy 437
- Williams C J
Observations on Opium Assay 1053
- Williams Lawrence S
The Successful Application of U S P and N F
Publicity in a Retail Pharmacy 395
- Wilson R C
Report of Committee on Nominations 912
- Wilson Stephen
Report as Secretary Pittsburgh Branch 1105
- Wirth Elmer H
Studies on Cudbear 949
Teaching of Habitats in Pharmacognosy 413
- Worton A G
Solution of Cresol Compound—the Variation of
Phenol Coefficient when Different Oils Are Used
for Saponaceous Base 1077
- Wright Thomas G
Assay of Citrine Ointment 102
- Wruble Milton
Enteric Coatings I A Laboratory Method for
the Study and Control of Enteric Coatings 570
Enteric Coatings II Excretion Studies with
Sodium Salicylate Tablets 1074
- Xavier M Francis
Phytochemical Notes 539
Unusual Peppermint Oil 539
- Yates S B
Drug Extraction III The Function of Prelimi-
nary Maceration in Relation to the Percolation of
Belladonna Root 538
- Yavorsky M A
Pharmacology of Galinsoga 108
- Youngken Heber W
Eminent American Pharmacognosists of 19th Cen-
tury 25 148
Further Studies on Psyllium Seed 207
Microscopy of Powdered Desiccated Endocrine
Glands 575
Report of the Committee on Horticultural Nomen-
clature 911 1021
Report of Historical Section 921 1014
Text Book of Pharmacognosy 438
- Zieffe Adolph
Report for Committee on Student Branches 911

If item is not found under heading searched for in Authors' or Subject Index, please refer to Branches, Conferences Discussions, Minutes of foregoing, Council, Discussions, General Sessions House of Delegates Reports, Committees, Sections, etc

INDEX TO SUBJECTS

(See Authors' Index for titles of papers, also for titles in this (Subject Index))

A

Abstract

proposed changes with new standards and descriptions 11th revision U S P E F Cook 716
784 787 878 882 1030
remarks by Remington medalist S L Hilton 926
Section of JOURNAL 182 439 688
(see each issue of the JOURNAL March to December)

Abstracts

of minutes of the Sessions held in Multnomah Hotel 893
pharmaceutical (p 1 beginning in March issue)
1 33 69 105 141 177 213 253 293 333 1109
scientific literature 930

Academy of Medicine Madrid bicentennial of 251
Academy of Sciences and American Association for
Advancement of Science 338

(see Association for the Advancement of Science)
Account book revolutionary of Christopher Jr
and Charles Marshall Charles H and Millicent R
LaWall 302

Accuracy and speed factors in hand filling capsules
John W Lee 469

blocking method punching method 471

Achillea millefolium the sterols of Ole Gisvold 1071
Acid chloride action of on the phenol in benzene with
potassium carbonate 555

daturic Ralph W Clark 843

reaction between and the phenol in pyridine 555

Act Italian Pharmacy 585

(see Law Legislation Bills)

Action on recommendations of President R P Fischelis
923

Acyl derivatives of ortho aminophenol C B Pollard
and W T Forsee Jr 363

Adamo Martin E appointed on Division Emigration
1124

Addiction codeine liability of 1052

Address
(see House of Delegates General Session Sections
Branches, A A C P N A B P)

Baker Wm B standardization of aconite prepara-
tions 70

Beal James H The Pharmacopœia of the U S
and the Federal Food and Drugs Act 810

Bishop Dr Louis F coronary artery disease 1104

Bryce Dr David medicinal dyes 241

Burlage H M chairman section on Practical
Pharmacy and Dispensing 1002

Costello P H installation 818

Delgado F A prescription department economics—
some high lights of the revised edition of the Pro-
fessional Pharmacy 815

Durham O C allergy from the standpoint of the
manufacturer and pharmacist 72

Evans C H president of the N A B P 673

Fischelis R P president of the A Ph A 605 635

Gardner Roy Australian and New Zealand Associa-
tion for the advancement of science 833

Gault Edgar H ethics of modern advertising 437

Henry S C problems facing the drug trade 430

Hunt Wm H bioassay of strophanthus prepara-
tions 70

Jones Rowland chairman of the House of Delegates
656

Jordan C B food drug and cosmetic legislation
437

Klein Dr David glandular products from the
pharmaceutical standpoint 76

Lascoff J Leon it can be done 232

Leech Paul N some topics of interest to pharmacist
and physician 338

Little Ernest president of the A A C P 659

Lott Wm A rational of chemo physiological re-
search 162

Lynn E V chairman Scientific Section 995

Meany Dr P T dentistry and pharmacy 810
1087

Meyer Erich white mineral oil and petrolatum in
pharmaceutical and cosmetic practice 319

Mickelsen A O prescription writing by the dental
profession 250

Munch James C recent developments in pharma-
cology of digitalis 247

Murchison Claudius T research needs and activities
in field by distribution 826

Newburgh Louis H drugs and nutrition 437
Noel H S the future outlook for financial success
in pharmacy 1101

Pettit Joseph A the practical value to the pharma-
cists of the activities of the Council on Pharmacy
and Chemistry, American Medical Association 810

Rosen Harry pyrethrum 70

Schroeder Dr Frederick modern medicine in
relation to prescription writing 73

Viehoever Arno evaluation of cathartic drugs 423
1000

Willard H H ultra violet fluorescence as applied to
problems of chemistry and pharmacy 437

Advertising

coöperative professional place of a field representa-
tive in L Wait Rising 142

Alcohol tax free 84

(see Legislation)

Alkalies and alkali salts note on action of on anti-
pyrine Loyd E Harris and Ercell D Tebow 1069

Alkaloid, new pharmacologic action of 187
(see name of alkaloid)

Alkaloidal reagents VII Detection of thallium
J C Munch and Justus C Ward 351

Alkaloidal substance new chemical nature of 186

Alkaloids quantitative determination of with bromine
Robert A Hatcher and Robert L Hatcher 262

Allen Dr Willard Myron award in biochemistry 342

Alumni Luncheon Philadelphia College of Pharmacy
and Science 825

American Association for Advancement of Science
program 328 436 528 903 932 meeting 903 1037

American Association of Colleges of Pharmacy
department of C B Jordan 61 153 227 307 413
490 577 778 868 991 1095

officers 527 731 782

thirty sixth annual meeting 518

American Council on Education 433 703

American Drug Manufacturers Association 92 172
433

American Druggists Fire Insurance Co 174

AMERICAN INSTITUTE OF PHARMACY listed in Archi-
tects and Sculptors 430 1095

Panels 937 938

American Medical Association 77

history repeats 1044

AMERICAN PHARMACEUTICAL ASSOCIATION 171

and N A R D Joint Committee 700

at Texas Centennial Exposition Dallas 1094
Council 705

former presidents 806

joint committee N A R D 1110

meeting Portland 1935 171 179 437 587 806

committees for 251

local secretary 347

papers for sections of 182 994

program 512 587

monographs 702

officers elect for 1936-1937 1071

sections of 994

American Pharmaceutical Manufacturers Association
433

officers 528

American Professional Pharmacist succeeded the
Practical Druggist 432

American Red Cross 729

Ames Joseph Sweetman president J H U retired
525

Amidopyrine 265

Aminophenol diacyl derivatives of 365

Ammonium benzoate 13

salicylate 13

Analgesic pigment 214

Anderson's pills 145

Andrews M J awarded Ebert prize 728

Anniversary golden meetings 434

(see Historian's Report)

Chicago Retail Druggists Association 434

National Editorial Association 437

Tennessee Pharmaceutical Association 434

Annual report for 1934 of Central Narcotics Intelligence
Bureau Egyptian government 524

Antidotes I General plan James C Munch and F E
Greenbaum 38

Antipyrine 265 1069

Apomorphine hydrochloride 265

Apothecary shops of colonial times 741 963

- Apparatus continuous reading titration L H Bal
dinger 6
Applicants for membership, 60 510, 512 582 583,
576 877 1035 1037
(see Council Letters)
Application of statistical methods to pharmaceutical
research IV Methods of recording drug action
J C Munch and I I Garlough 610
Application successful of U S P and N F publicity
in retail pharmacy, Lawrence S Williams 705
Appointment of standing and special committees and
delegates of the Association, 700
Appropriations 1108
Arsenamides Compounds containing the As N link
age, G O Donk 453
Arsenic assay of organic medicinal preparations con
taining 990
Arsenic and arsenous reactions 455
Articles of incorporation of A Ph A 1112
Ashmore J D, president of South Carolina Pharma
ceutical Association 250
Assay
digitalis on normal and exsanguinated cats 15
for phenol in official preparations Glenn L Jenkins
and Melvin F W Dunker 840
glycerite of bismuth 502
methods for salts of organic acids Richard M
Hitchens 11
National Formulinary preparations containing bis
muth Glenn L Jenkins and Sylvia Millett 561
opium observations on Joseph Rosin and C J
Williams 1053
various methods 1054
organic medicinal preparations containing arsenic
990
reduced iron note on Margarethe Oakley and J C
Krantz 9
various lots of tincture of digitalis 16
Association
American
Advancement of Science 328 903 909 942
Colleges of Pharmacy C B Jordan 61 153 227
307 413 577 778 808 991 1095
program 577
Drug Manufacturers 172 433
officers 433
Medical 528
Atlantic City session, 77
Pharmaceutical
(see Applicants Business Council Meetings
Sections Committee etc AMERICAN PHAR
MACUTICAL ASSOCIATION)
Pharmaceutical Manufacturers 433
officers 433 528
Brooklyn Pharmaceutical 81
Business 64 104 329 426 509 581 681 804 876
1034 1107
Canadian Pharmaceutical 527 730
Chicago Retail Druggists golden anniversary 434
Insecticide and Disinfectant 80
Military Surgeons of U S 825
National Boards of Pharmacy 872
National Editorial 437
golden anniversary 437, 1095
National Retail Druggists 732 825
meeting 732
National Wholesale Druggists 825
National Tuberculosis 256
Official Agricultural Chemists 1042
Pan American Medical 635
Associations 707
pharmaceutical state and national 903
Astringent mouth wash 508
Auditors selection of 68 164
Award in biochemistry to Dr Willard M Allen 342
Ebert 604 728 817
- B**
- Bachman Gustav counselor 328
honored 250
Badian manuscript 605
an Aztec pharmacopoeia Emily Walcott Emmart
771 929
Baltimore and D C Veterans Association 433
Bang's disease in cattle 726
Barbituric acid derivatives quantitative analysis of
1070
Barney Esther H given recognition 928
Beal James H, honored by Southeastern Drug Jour
nal 430
contributed \$1000.00 to endowment fund 918
sketch of in Industrial and Engineering Chemistry
824
Beetle drug store 286
Belladonna root, function of preliminary maceration in
relation to the percolation of 538
Benzocaine camphor oil 214
Benzoate, ammonium sodium 13
Bequest of Frederick B, Kilmer 426 683
Beverages non alcoholic use of lactic acid for 822
Bibliography of Pharmaceutical Research A G Du
Miez 40 117 107
Pharmaceutical Abstracts each issue of the JOURNAL
Bill advertisement, 84
Copeland 254 531 586 1102
Food and Drug in Congress 83 435 701 759 810
(see Editorials)
Bill
health insurance 83
H R 3072 J M Mead 83
H R 8442 and S 3154 599
Patman 730 1102
S & Copeland 83 161 340, 435 635 750 810
S 590 Senator Pat McCorran 83
S 1130 Wagner 89
Bioray of digitalis studies on James H Defandorf
309
Bismuth assay glycerite of, 502
Bliss A R Jr
paper at International Physiological Congress in
Leningrad and Moscow 337
Blue Eagles 84
Board of Canvassers 707
Board of Review of Papers 920
Boards and Colleges of Pharmacy annual meeting
District No 2 226
Boerckle and Tafel celebrating one hundredth anniver
sary of establishment 430
Bonds sale and exchange 1109
Bonnerville Dam visited by A Ph A delegates 437
Book Notices and Reviews 88 176 341 438 783
827 933 1124
Annual Survey of American Chemistry 439
Annual Survey of Research in Pharmacy 1933-1934
and Proceedings of National Conference on
Pharmaceutical Research 177
Beiträge zur Mikroskopischen Diagnostik der
Gemüse I eguminosenhülsen Wurzel und Knollen
genöse Blatt und Stengelnöse 177
Dechema Monographs No 49-56 341
Dictionary of American Biography 827
Dissertations for Doctor's Degree 177
Drug Standards Manual 827
Hand Book of Chemistry 88
Jurisprudence and Toxicology Glaister 1124
Law of Drugs and Druggists 430
Law of Patents for Chemists 439
Lea and Feibiger Memorial Volume 177
Medicinal Plants of France 935
Modern Drug Encyclopedia and Therapeutic Guide
89
Our Willie 88
Proceedings of 60th regular meeting of the National
Wholesale Druggists Association 177
Romance Exploration 341
Structure and Composition of Foods 827
Text Book of Pharmacognosy 438
Therapy of Cook County Hospital 177
Toxicologie Moderne A I Usage des Etudiants en
Medecine et en Pharmacie des Medecins Legistes
et des Chimistes Experts 170
Urinary Analysis and Diagnosis 341
Botany course as a foundation for pharmacognosy of
stem and bark drugs C C Albers 310
Branches A Ph A 70 160 232 315 420 494 522
822 924 932 1027, 1032 1106
(see Name of Branch and Roster)
Baltimore 70 232 315 420 932 1027 1100
Chicago, 72 160 238 315 494 521 924 1027 1101
Detroit 437
Maryland University Students Auxiliary 1101
organized 1101
New York, 73 161 239 317 420 495 1028 1031
1102
Northern New Jersey 162 428 522 1032
Northern Ohio 74, 423 1032
Philadelphia 76 163 247 326 498 522 924, 1032
1105
Pittsburgh 1105
St John's Student Branch 327 424 1032 1106
Breasted James H, graduate of Chicago College of
Pharmacy 1040
British Pharmaceutical Conference 598
British physicians visit United States 728
Broadcasts 78 927

Bromine

- quantitative determination of alkaloids with Robert A Hatcher and Robert L Hatcher 262
- volatilization of 264
- Bronx drug clerks strike 73
- Budget for 1935 67 104 704
- Budget for 1936 1108
- Budgets retail drug trade 437
- Bulletins 20 21 22 695
- Bunting George A entertained members of Baltimore Veteran Druggists Association 430
- Business Association 65 164 329 426 500 581 681 804 870 1034 1107
- Byers George E report as secretary Philadelphia Branch, A Ph A 76 163 247 326 498 522, 924 1032
- By Laws Association 807
- (see Address President Fischels)

C

- Caffeine 265 1046
- gingerals etc sometimes contain 1046
- Calcium compounds six a comparative study of the absorbability of A Richard Bliss Jr and Robert W Morrison 280
- Calcium gluconate improved method cuts cost of making 434
- California Fair Trade Act Ira J Darling 981
- California Medical Society endorses sickness insurance 342
- Calomel study of from physical and chemical standpoint C H LaWall and Joseph W E Harrison 97 726
- Cameron John donated copy of *Formulary published by Committee on Hospital of the Peiping Union Medical College* 163
- Campbell Dr Charles presented A I P with two mortars one a Wedgwood and the other a porcelain 1040
- Campior assay of liniment of D A Overbye and R E Schoetzow 961
- Cancer cure vendor escapes prosecution dies with cancer 248
- Cancer research 726
- Carbo activatus Joseph Rosin George D Beal and Chester R Szalkowski 630
- Cascara sagrada 787
- Centennial celebration at Tulane 168
- Center of population of pharmaceutical education 1870-1930 Walter Crosby Eells 868
- Certificates appreciation to members of Committee on Pharmacy Exhibit at Century of Progress and to Miss Esther Barney and Thaddeus Niemec 702
- to contributors to Century of Progress fund 1039
- Charcoals various adsorption of strychnine sulphate John F Suchy and R V Rice 120
- (see Carbo Activatus 630)
- Chemical Foundation Inc sent copy of *The Farm Chemurgic* 79
- Chemical study of sulphur ointment Lewis C Britt 854
- Chemistry of heptane and its solutions Joseph Semb 547
- Chemistry of the hormones 412
- Chicago Medical Society 933
- Chicago Retail Druggists Association 434
- Chief of Bureau of Medicine and Surgery 429
- Christensen H C donated set of *Proceedings N A B P* 81
- given plaque in recognition of his services at Chicago World's Fair 728
- given recognition 928
- report of Pharmacy Exhibit for 1933-1934 1018
- Cignoli Francisco Spanish reprint on *Formularies* 930
- Cinchonidine and cinchonine 265
- Citrine ointment assay of determination of mercury lost in preparation of 105
- perchloric nitric acid method 107
- Strickland's method 106
- Wright Thomas G 102
- Civil Service examinations 78 249 727 1039
- Code 253
- authorities causes for removal of 83
- commending work of E F Kelly 1110
- drug brief history of E F Kelly 767
- Federal Trade Commission writing 584
- funds go to Pharmacy Board in Oregon 1043
- meeting 435
- Codine addiction liability of 1052
- sulphate 265
- Combined analgesics 214
- Comments on paper by Professor Antoine E Green on Teaching Urinalysis to Students of Pharmacy Louis Gershenfeld 417
- Commission of Proprietary Medicines 706
- (see Association Business)
- Committee
- advisory of the Council 706
- A Ph A meeting 251
- chairman (Baltimore Branch) 72
- Constitution and By Laws 1110
- coordinate health activities of government 823
- cosmetics 707
- Council on Pharmaceutical Practice 707
- development of pharmacy laws 877
- draft model act restricting distribution of drugs and medicines to pharmacists 707 877
- Ebert Prize report of 1000
- emblem for Association 1036 1107
- endowment 331 707 878
- finance 428 706
- horticultural nomenclature 707
- international pharmaceutical nomenclature 707
- joint A Ph A and N A R D 1110
- legislation 707
- library 512 804
- Local Branches 707
- maintenance 164 330 707 808
- museum 512 705 804
- National Formulary 509 511 512 702
- nominees 511
- (see Association Business)
- nominations 894
- pharmaceutical research 706
- pharmaceutical syllabus 707
- pharmacy corps 707 877
- (see International Pharmaceutical Federation)
- pharmacy week 704 707 1110
- appropriations 1108
- prerequisite legislation 707
- prescription tolerances 707
- press relations 707
- Procter Wm Jr memorial fund 707 1023
- property and funds 683 706
- proposed council on pharmaceutical practice 64 166 426 811
- proprietary medicines 700 706 1110
- publications 331 684 706 1109
- recipe book 702 706
- reports, 374 520 708 1021
- research A Ph A H V Army 520 1108
- resolutions 894
- standard program 706
- study constitution and by laws 878
- study courses in history of pharmacy 878
- study of pharmacy 707
- transportation 182 306 350 878 1026
- U S P 707
- ways and means 1110
- weights and measures 707
- YEAR BOOK 1109
- Committees
- and delegates 1037
- appointment of 877
- (see Association Business)
- Comparative studies on the utilization of different magnesium salts J C Forbes and F P Pitts 450
- study of enteric coatings F S Bukey and Phyllis Rhodes 567
- Comparison
- activity of hydro alcoholic extracts aqueous extracts and available salts of ergotamine and ergotamine 26
- four year curricula in pharmaceutical subjects Henry M Burlage 228
- iodine content of thyroid 747
- of six methods in assaying the new ergot principle E E Swanson 998
- Conference Imperial Botanical 168
- National Drug Trade high lights 1124
- Pharmaceutical Association Secretaries, 731
- officers 731
- Teachers
- chemistry 518 783
- pharmaceutical economics 518 783
- pharmacognosy and pharmacology 518 783
- pharmacy 518 782
- Congress
- American Scientific 634 1124
- Argentine on medical economics 44
- international of hospitals 168 336
- pharmacy twelfth international 169 261 336 436
- papers 436
- Connolly F W presented formulary of London hospital 169
- Content of a pharmacognosy course George W Fiero 1095

Contract for printing and mailing the JOURNAL OF A Ph A for 1935, 66 164
 Contract for printing YEAR BOOK 164
 Convention committee 104
 Cook E F
 appointed by Department of State as representative at League of Nations Conference on Biological Standardization 824
 Chairman U S P Revision Committee 878 882
 resigned as nominee for president A Ph A 877
 Cook Roy B Chairman Committee on Proprietary Medicines 1110
 Cooperation between dentists and pharmacists Samuel M Gordon 136
 Copeland Royal S S 5 161
 (see Legislation and Food and Drug Legislation)
 Correction 81 726
 Corvallis School of Pharmacy 531
 Couch James I President of Chemical Society of Washington D C, 476
 Council, 682 1107
 American on education 433
 A Ph A, 705
 ex officio members 706
 letters 64 66 164 166 329 426 509 511 512
 581 583 681 682, 705, 804 876 877 1034 1035
 1036 1107 1112
 meeting executive committee 329 1107
 minutes of 682 1036
 correction 1036
 officers of 705
 on Pharmacy and Chemistry
 on revision of Food and Drugs Act in special reference to drugs 82
 thirteenth anniversary 169
 Councilors to American Association for Advancement of Science 878
 Courses vacation at University of Heidelberg 168
 Cresol solution compound 969
 study of K L Kaufman and C O Lee 966
 proposed new formula for compound 969
 surface tension of compound 969
 variation of phenol coefficient when different oils are used for saponaceous base P L Burrin A G Worton and F E Bibbins 1077
 Cudbear
 arsenic content of 957
 microscopic 955
 studies on E H Wirth L E Martin and P G Soderdahl 949
 Culbreth Dr D M R honorary president 605
 Cyanide poisoning and its treatment K K Chen Charles L Rose and G H A Clowes 625

D

Daffy's elixir 146
 Dairy food and drug officials meet 528
 Dargavel John resolution commending work of E F Kelly 1111
 Data statistical compiled from student records in botany and pharmacognosy 993
 Daturic acid R W Clark 843
 Decision important 248
 Decisions of 12th international congress of pharmacy 1113
 Definitions international pharmaceutical federation, 1121
 Dentifrices history of Martha E Foulk and Elizabeth Pickering 975
 Dentistry and pharmacy P T Meaney, 1087
 Department A A C P C B Jordan 61 153 227
 307 413 490 577 778 868 991 1095
 N A B P H C Christensen 872
 Der Apotheker 601
 Determination of reasonable or permissible margin of error in dispensing V liquids, Marvin J Andrews 477
 Development of pharmacy in West China E N Meuser 865
 Diehl C Lewis 1049
 Diethyl barbituric acid from alkaline urine extraction of 849
 Digger pine non heptane constituents of, Arthur H Uhl 380
 Digitalis 1095
 absorption extract of in
 glycerinated gelatin suppositories 376
 hard gelatin capsules administered by rectum 377
 assay on normal and exsanguinated cats D I Macht 15
 Oregon potency of Donald Kuo Chin Lee and Ernst T Stuhr 367
 recent developments in pharmacology of 247

rectal absorption of in cats W Arthur Purdum 374
 studies on bioassay of James H Defandorf 276 360
 U S P standard for I A Upsher Smith 272
 Dimyristylcarbinol isolation 113
 dinitrophenol blindness caused by use of 726
 dinner of past presidents 606
 dioume 206
 diothane solution stability of II E S Cook K Bambach and T H Rider, 269
 directory educational 77
 Discussion
 (see Council, Conferences General Sessions House of Delegates Sections)
 Council on Pharmaceutical Practice 813 814, 815
 Disinfectant skin new 1103
 Dispensing in hospitals 821
 District of Columbia Pharmaceutical Society 704
 Doctors and druggists meeting 338
 Dohme Charles L memorial lectureship 1041
 Dohme portrait presentation 520
 Donations 81 163 169 250 331 342 809 1016
 copy of Boerhaave's Materia Medica Mrs L S Williams 625
 copy of Chemical Amusement a series of curious and instructive experiments in chemistry presented by Mary F Apple 525
 Formulary of London Hospital F W Connolly 169
 Formulary published by Committee on the Hospital of Peiping Union Medical College John Cameron 163
 Fund of \$250 00 District of Columbia Pharmaceutical Association 809
 Leech Monopoly in Croatian Slavonica Prof Dr A Vrgoc 783
 letter of H P Hynson copies of *Druggists Circular* N F 1888 bottles of fluidextracts glass mortar sign troy weights Harry L Schrader 337
 mortars several old dispensing bottles and a quassia cup Mary D Robinson 250
 pamphlets and books from library of H W Wiley Mrs Harvey W Wiley 809
 photographs of plants University of Minnesota School of Pharmacy, 809
 Physicians Pocket Manual of Useful Drugs J Leon Lascoff, 827
 picture of the Pharmacy Exhibit Century of Progress Esther H Barney 809
 proceedings A A C P 342
 proceedings N A B P H C Christensen 81 809
 projection apparatus for meeting room Mr and Mrs J C Peacock, 809
 Quantitative Pharmaceutical Chemistry autographed Glenn L Jenkins and A G DuMez 827
 reprints from Chudester F E 342
 Department of Pharmaceutical Research of Shanghai Science Institute on Chemical Composition of Daphne Genkwa 342
 German Apotheke healing and spice drugs 342
 Krantz J C, Jr 342
 Wellcome Chemical Research Laboratory 342
 reprints on
 American Pharmacy Svend Nielsen 81
 Dressings surgical 696
 Drug and chemical dinner 173
 Drug control work report on W G Campbell 1043
 Drug extraction II, III IV V Wm J Husa C L Huyck S B Yates Paul Fehder Louis Magid 446 538 615 830
 Drug law revision postponed to 1936 729
 Drug sales school 159
 Drug store exhibit 79
 Drug trade all branches evolve Maryland contracts 1045
 Drug Trade Conference meeting December 6 1042
 Drug trades exposition 732
 Drug World 935
 Druggists business conference at Purdue 251
 Drugs
 absorption of by human skin 1038
 and bugs Ernst T Stuhr, 285
 from automatic machines 249
 Hungarian 823
 suggestions and precautions to be observed for proper storing of 288
 Duquesne University 531
 Durrett J J chief of drug division of U S Food & Drug Administration 1040
 Dusting powders 775
 Dutch drops 146

E

Earthquakes Montana 931
 Ebert prize awarded to M J Andrews 604 728, 817

- Eby Frank H. frontispiece and sketch 442-443
 Eddy, Clyde through the Colorado canyons 339
 Eder, R. visited the U S 930 1040
 Editorials
 After eighty three years—Portland R P Fischelis 536
 Federal drug legislation must not be permitted to die R P Fischelis 349
 Let's see what we can do Ernest Little 736
 membership P H Costello 736
 new U S P X interim revision of ergot assay L T Cook 5
 pharmacy and American Association for Advancement of Science J C Krantz 942
 Editorials E G Eberle
 Association Pan American Medical 183
 bill for extending the life of the NRA 261
 blue eagle and the NRA 537
 contributory professional service 536
 deductions from the papers of the A Ph A 832
 division of Health Sciences 184
 drug jars in New York museum 184
 education of the public in Fair Trade Practices 832
 educational value to be derived from the travel to the conventions of the A Ph A 739
 eighty fourth annual meeting of A Ph A 606
 first aid week 94
 hospital distribution and hospital service 261
 international congress of military medicine and pharmacy 260 348 444
 international congress of pharmacy 183 444
 it is doing as well as the aims and purposes 740
 Japanese pharmacopoeia commission 943
 limitation of number of pharmacists 942
 narcotic drug traffic 94
 National Formulary and Pharmacopoeia 941
 New Year 4
 petroleum variation in contributory harmfulness of 261
 pharmacist in literature and the museum of the A I P 348
 pharmacists and Public Health Service 445
 Pharmacopoeia and National Formulary 941
 Portland meeting of A Ph A 604
 prescription department 740
 relative positions in *Materia Medica* of inorganic synthetic organic and natural organic substances 833
 service library 95
 signs of progress in pharmacy 4
 Editorial Notes 78 168 249 336 429 524 727 822 928 1039
 abstract of U S P changes 1039
 Badianus manuscript 929
 broadcasts Purdue University 78
 centennial celebration at Tulane 168
 certificates issued to contributors to Century of Progress fund 1039
 chief Bureau of Medicine and Surgery 429
 committee to coordinate health activities of government 823
 cotton stripper tested in harvesting pyrethrum 823
 courses vacation at University of Heidelberg 168
 drugs from automatic machines 249
 Ebert prize awards 822
 excise tax continued for two years 584
 federal trade commission writing codes 584
 fourth International Hospital Congress in Rome 168
 Hilton S L Remington medalist 336
 Hungarian drugs 823
 Idaho enlarges plant garden 336
 imperial botanical conference 168
 infantile paralysis serum 929
 international congress of hospitals 336
 Jordan Dean C B honored 336
 Kentucky farm for narcotic addicts 429
 new section to the British poisons list 584
 personnel changes in Swedish pharmaceutical circles 823
 pharmaceutical museum for Moscow 429
 pharmacy in Japan 584
 play based on life of Semmelweis 249
 poisoning case reported 429
 preservatives newer used in pharmacy 929
 public health council of Kansas 78
 public health professorship 168
 recognition of outstanding services for pharmacy at Century of Progress exhibition 928
 Red Cross roll call 928
 Remington Medal award and dinner 822
 report International Congress of Military Medicine and Pharmacy 336
 School of Pharmacy of Oregon 584
 social security program 78
 society Austrian pharmaceutical 168
 suppositories new base for 78
 centenary of chemistry 249
 tri state meeting 822
 twelfth International Pharmaceutical Congress 336
 unfortunate error 168
 U S Civil Service examinations 78 249 727 1039
 U S P exhibit Kentucky 928
 use of lactic acid for non alcoholic beverages 822
 vitamin A and D products E N Gathercoal 429
 Year Book and monthly abstracts 929
 Effect of alcohol water mixtures on wood of belladonna root 446
 altitude on action of drugs I Strychnine A W Moore and Justus C Ward 460
 certain physical properties of liquids on magnitude of error 481
 effect of fineness of powder on percolation of belladonna root 447
 glycerin alcohol mixtures on wood of belladonna root 447
 size and shape of graduate on measurement of defective volumes of liquid 478
 Eighth International Congress of Military Medicine and Pharmacy 261
 Electrode potentials formulation of 398
 Electrolysis on pH effect of 400
 Elixir mislabeled of terpin hydrate and codeine 84
 phenobarbital 1080
 Emblem suitable for the Association 704 1036 1107
 Emerson John C new president of Missouri Pharmaceutical Association 430
 Emetine 266
 Emollients 776
 Emulsion of liquid petrolatum 791
 Enteric coatings
 I A laboratory method for the study and control of enteric coatings Milton Wruble 570
 II Excretion studies with sodium salicylate tablets Milton Wruble 1074
 comparative study of F S Bukey and Phyllis Rhodes 567
 Ephedrine alkaloid crystalline forms of E E Moore and D L Tabern 211
 Ergosterol attempt to ketonize 115
 Ergostetrine action of on cockscomb 750
 rabbit uterus 750
 color reactions 749
 Ergotcin maleate assay of by various methods 837
 Ergot
 active constituents of M R Thompson 185
 active constituents of a pharmacological and chemical study M R Thompson 24 750
 alkaloids of 186
 chemical isolation of a hitherto unidentified member of the total specific alkaloids 185
 new highly important substance in determination of existence and chemical nature of 33
 Russian H H Rusby 382
 Ergotoxine available salts of 26
 Error unfortunate 168
 Escharotics 776
 Estabrook H A frontispiece and sketch 602
 Excretion studies with sodium salicylate tablets Milton Wruble 1074
 Exemption from taxation 582
 Exhibit pharmacy in Rosenwald museum 1018
 Extractor air lift applied to analysis of alkaloidal drug extracts L D Seif and T H Rider 267
 Extracts alkaloidal drug the air lift extractor applied to the analysis of L D Seif and T H Rider 267
 vegetable and blood sugar by Paul S Jorgensen and E V Lynn 389
- F**
- Fairchild Scholarship Committee report of 678
 Fair Trade
 activity new NRA body to survey 730
 legalized new approach to 1042
 measures 440
 Federal Alcohol Control Administration 343
 F E R A prescription price schedule L A Seltzer 76
 liquid administered in drop doses 76
 liquid mixtures compound 76
 lotions 77
 ointments 77
 specials 77
 suppositories 77
 Federal Food and Drugs Act proposed 701
 Federation international bulletin of 169 1120
 communication to governments 1120

- officers 1120
 Fein Mary A, twenty five years secretary of Arkansas association 169
 Fellowships George Washington University 433
 Finance committee on 682 1107
 Fischelis R P appointed by Governor as member of Committee to study problems of unemployment in insurance old age relief etc , 600
 Fitch I W analysis of price stabilization 252
 Food and Drugs Act J H Beal 759
 Food and drug legislation 61 701 1102
 Foresight in professional pharmacy Ernst T Stuhr 1092
 Formulary
 New Jersey 80
 University Hospital University of Michigan 583
 (see National Formulary)
 Formulas
 dental 696 777
 photographic 696
 veterinary 696
 Forrester George P discontinued editorship of *Chemist and Druggist* 525
 Foster Hall 79
 Frontispiece
 Eby Frank H 442
 Estabrook H A 602
 Gregory Willis G 258
 Henry Harvey A 734
 Hogstad Anton Jr 180
 Ingalls John 534
 Kilmer F B 2
 Rojahn Carl August 830
 Smith A Homer 92
 Funds 1112
 (see Reports of Secretary and Treasurer)

G

- Galenicals 696
 Gales George M resigned as member of N R D C Authority 343
 Galinsoga pharmacology of M A Yavorsky with E C Reif 108
 Garvin Alice succeeded her father P J Garvin as secretary of Connecticut Association 169
 Garvin P J steel engraving of unveiled 525
 Gayle J W secretary of Kentucky association for forty seven years 585
 Gelatin as a stabilizing colloid for oil in water emulsion systems Linwood Tice 1062
 General expenses appropriations 67
 General program for the 83rd annual meeting 583
 Gerlach John A presented prescription balance to museum of the A I P 728
 Gift to Medical College of Virginia 932
 Gisvold Dr Ole member University of Minnesota staff 1040
 Glands endocrine microscopy of powdered desiccated endocrine 576
 Gleason Mrs Edna made presentations 913
 Golden treasure Leon T Hurtt 221
 Gorgas Memorial Institute 1043
 Graph
 effects of umbellulone 205
 gelatin solutions 1066
 movement of centers of population of pharmaceutical education and of the general population 870
 number of carbon atoms in acid 844
 pharmacological and chemical studies of ergot 28
 titration curves 8
 toxicity of strychnine orally to Columbian ground squirrels 462
 Greenish Prof H G fund raised to perpetuate his memory 342
 Gregory Willis G
 frontispiece and sketch 2a8
 oil painting to be presented to School of Pharmacy Buffalo 1040
 Griffin Mr and Mrs L W celebrated golden anniversary 728

H

- Hall of Fame additions to 1046
 Hamamelis history of (witch hazel) extract and distillate, John Uri Lloyd and John Thomas Lloyd 220
 Hamor Wm A received honorary degree of Dr of Science 525
 Hancock James E heading movement to have Constitution brought to Ft McHenry 337
 Harris C C resigns as president Texas Pharmaceutical Association 1124

- Harvard University has created a new Doctor of Philosophy degree in History of Science and Learning 459
 Headquarters building 684
 Health insurance Canadian 432
 Heger s Hans 80th birthday celebrated 930
 Hellenberger method 1053
 Henry Harvey A frontispiece and sketch 734-735
 Henshaw David—from Druggist to Secretary of the Navy George C Ewe 858
 Hilton Samuel L 15th Remington medalist 925
 History in drug store F B Kilmer 55
 calcium lactophosphate preparations Wm J Husa and A P McLean 58
 History of Science Society 1097
 Hogstad Anton Jr frontispiece and sketch 180
 Honoraria to committeemen 694
 Honorarium editor of Recipe Book I 509 702
 Hormones
 chemistry 412
 Hoshi Hajime visited U S 1099
 Hospital
 abandons laboratory practice in medicine 80
 and the pharmacist H C McAllister 970
 formula 695
 pharmacy 933
 pharmacy practice an innovation J Solon Mordell, 50
 Hotel Multnomah headquarters for 1935 165
 House of Delegates A Ph A 893
 How should fundamental courses in chemistry be taught in a college of pharmacy Ernest Little 307
 How to help the pharmacist commercially E C Brokmeyer 861
 Howard University 825
 Howe Dr Marshall A director of the New York Botanical Gardens 728
 Hume E E report 12th international congress of pharmacy 1113
 Hunsberger Ambrose Jr Chief Research Division John Wyeth & Bro 337
 Hutchins Harold managing editor of *American Druggist* 525
 Hydro alcoholic extracts comparison of activity of 26
 Hydrogen ion catalysis 399
 Hyperhidrosis and bromidrosis 777
 Hyptis mutabilis volatile oil of Harold W Werner 289
- I
- Idaho enlarges Plant Garden 336
 Illustration
 buffer capacity of acacia 407
 buffer capacity of tragacanth 407
 continuous reading titration apparatus 6
 decomposition velocity of oxytocin 411
 fractionation of ergot into active and inactive components 31
 hydrolysis curves of alkaloidal salts 403
 isolated strips of rabbit uterus 751
 titration apparatus 7
 Infantile paralysis serum 929
 Infusa 791
 Ingalls John frontispiece and sketch 534-535
 Insecticides for vegetables safer developed by Agriculture Department 343
 Insects pharmacological distinction of 286
 Installation of officers 818
 International Congress of Pharmacy 727 821
 Hospital Association 825
 Pharmaceutical Federation 655 707 909
 serum center is established 1043
 Inter-Society Color Council 338
 Iodine phenolated solution of 841
 Iron reduced note on assay 9
- J
- Jelinek John P injured 337
 Joekel Carleton B Professor of Library Science in Graduate Library School of University of Chicago 343
 Johnson D B R honored 250 337
 Joint session Scientific Section and Section on Practical Pharmacy 999
 Jordan C B honored 312 336
 JOURNAL 684 editor of 687
- K
- Kappa Psi new chapter 732
 Karyolytics 776

- Kelly E F commending 1111
permitted to serve as secretary of Maryland Association 1111
- Kempner Lydia Rabinowitsch 732
- Kentucky U S P exhibit 928
- Kilmer F B bequest by 167
frontispiece and sketch 3
prize 684
prizes for pharmacy 3
- Kirby Frank B given recognition 928
- Knowing the history of one's profession C O Lee 1012
- Koff Arthur K clinical experiments 195
- Kraemer Henry sketch 216
- Krantz J C Jr counselor 328
- Kremers Edward relieved of his duties at University of Wisconsin 585
- L**
- Lactic acid use of for non alcoholic beverages 822
- Landmarks Society Alexandria Va plans restoration of Stabler Leadbeater drugstore 810
- Langmuir's equation 121
- Lascoff J Leon
extensive purchase of drug jars etc from Wana maker collection 338
twenty five years on New York Board of Pharmacy 707
- Law District of Columbia 1124
- Law Idaho pharmacy fails 344
- LaWall Charles H all 585
to attend meeting in Copenhagen of Committee upon uniform method of opium assay 525
to represent A Ph A at International Pharmaceutical Federation and at Congress of Pharmacy 525
- Lead method for revealing amounts on fruit etc 1046
- Leaf oils of Washington conifers VII Juniperus occidentalis E V Lynn and Louis Fischer 813
- League of Nations Conference on Biological Standardization 824
- Lease of dry ice well 1026
- Lecture Barger Prof C ergot 189
- Leech Paul N speaker at Chicago Branch 337
- Legal and Legislative 82 174 253 339 435 826 934 1044
- alcohol tax free 84
- bill advertisers 84
- Copeland hearings on 254
- health insurance 83
- H R 3972 presented by James M Mead 83
- S 580 introduced by Senator Pat McCarran 83
- Blue eagles 84
- code authorities causes for removal of 83
granted exemption from income tax 253
- code changes proposed New York health 935
- code extension 339
- code meeting 435
- commissions for pharmacists in U S Army 340
- Copeland Bill 83 174 339
- drug store signs identify establishment 84
- elivur mislabeled of terpin hydrate and codeine 84
- employees professional 82
- Fair Trade 436 935
- Wisconsin 935
- food and drug bills in Congress 82 435
- insurance compulsory sickness opposed by American Medical Association 174
- insurance health House eliminates provision of Wagner Lewis bill 175
- license Board directed to issue 84
- marijuana 175
- narcotic peddlers sentenced 84
- narcotic rules for Virgin Islands revised 255
- narcotic traffic 339
- N I R B seeks to end multi code rules 83
- NRA 175 339 435
- policy new of publicizing drug code violations 85
- recommendation for revision 84
- order restoring sales of toilet soap to retail code jurisdiction 253
- price control bills in Congress 339
- refunds tax commission in Ohio 84
- report of Council on Pharmacy and Chemistry on revision of the Food and Drugs Act in special reference to drugs 82
- restrictions of sales in Ohio 436
- retail code authority 340
- sales tax 253 339
- Legislation**
- Fair Trade 436 731 759 935
- food and drug 61 317 701 1102
- State
- Alabama 436
- Arizona 176 340
- Arkansas 175 254
- California 255 340 435
- Colorado 340
- Connecticut 435
- Florida 435
- Georgia 340
- Idaho 254
- Illinois 435 731
- Indiana 176
- Maryland 254 340 435 826
- Massachusetts 435
- Michigan 435
- Minnesota 254
- Missouri 176 435
- Montana 176
- Nebraska 435
- New Hampshire 435
- New Jersey 340 435
- North Carolina 435
- Ohio 435
- Oregon 254 340
- Pennsylvania 83 435
- South Carolina 435
- Texas 435 437 934
- Washington 340
- West Virginia 84
- Wisconsin 435 935
- tax toiletries 85
- Lepers cured 1046
- Letter from J W Dargavel Secretary of the N A R D E F Kelly 810
from W P Remington 806
- Lewis Howard B member National Board of Medical Examiners 250
- Liberty bonds sale and exchange of 804 876
- Librarians professional training for 930
- Life members 510
- Lilly Eli received honorary degree of Master of Pharmacy from Philadelphia College of Pharmacy 525
- Lilly I H & Co established research award of \$1000 00 and bronze medal 79
- Lilly J K weds 600
- Liniment white suggested formula for L H Baldinger 130
- Linimentum chloroformi 791
- Liquor aromaticus alkalinus N F VI 1091
- iodi mitis 788
- magnesia citratis 789
- potassii arsenitis 789
- sodii hypochloritis chirurgicahs 789
- Little Ernest address as President of the A A C P 659
honored 338
- Lloyd John Uri
sent telegram to Portland 807
visited Japan 1040 1099
- Lloyd's reagent adsorption of strychnine sulphate by 120
- Local Branches A Ph A
proceedings of 70 160 232 315 521 822 924 932 1027 1032 1106
student branches 903
(see Name)
- Lockyer's pills 146
- Long Crawford W honored 271
- Louisiana pharmacy building 597
- M**
- McCoy G W appointed by Department of State as a representative at League of Nations Conference on Biological Standardization 824
- Magnesium carbonate analysis of Harold R Bowers 128
- Maintenance of building appropriation increased 164 166
- Mair Wm article in *Chemist and Druggist* relating to A Ph A Stabler Leadbeater Drugstore etc 525
- Mankind and medicines Anton Hogstad Jr 79
- Mann Charles R honored 337
- Maryland sales tax repeal fails 731
- Massage preparations 776
- Medal Ebert M J Andrews 728 822
- Hanbury Frank Lee Pymen 728
- Priestley Wm A Noyes 728
- Remington S L Hilton 728
- Medical Association meeting at Atlantic City 598
- Medical College School of Pharmacy Virginia 933
- Medical mile stones 871
- Medical preparations Chinese demand for 826
- Medicinal dyes David Bryce 241
- Medicine dropper to deliver one minim (Apothecary's Measure) per drop R A Konnerth R E Schoetzow and F W Nitardy 856

Meeting pharmaceutical bodies 425
 Meissner F W 50th display at La Porte County Fair 728
 Members
 election of 512 682 702 1107 1111
 honorary 702
 (see Council Letters)
 Membership
 applications for 68 510 512 582 583 876 877 1035 1036 1037 1111
 life 106
 Memoriam in 677 1017
 Merck & Co have designed a distinctive professional window display 430
 Method new leg vein and intramuscular guinea pig J H Defendorf 276
 Methods
 of identification of the rhizomes of *Iris versicolor* L and *Iris virginica* L George M Hocking 17
 opium assays 1054
 spectrometric 1072
 Mickelsen A O frontispiece and sketch 346
 Microscopy of powdered desiccated endocrine glands H W Youngken 576
 Minutes
 council 682
 meeting Executive Committee 64 511
 (see Association Business)
 Mississippi featured Professor Hammond's school 430
 Mistura Crète 791
 Mitchell Charles L first Ebert prize winner 822
 Monilia tropicalis 201
 Monocyls properties of 365
 Monthly School of Pharmacy of Oregon 584
 Morphine
 addiction 726
 opium by alkaloids co-precipitated with 1060
 recovery of effect of temperature on 1058
 response of mice to 622
 sulphate 266
 Motion—See Association Business
 Mouth rinse 508
 Mulford H K dinner honoring 50 years of pharmacy 1124
 Munch James C
 Antidotes I General Plan 38
 Museum pharmaceutical for Moscow 429
 Myrtle oil of ketone from 198

N

Narcotic farm federal opening of 116 429
 peddlers sentenced 84
 Narcotics encouraging the use of 526
 National Academy of Sciences and Executive Committee American Association for the Advancement of Science joint meeting 219
 National Association Boards of pharmacy
 Amendment of the constitution and by laws 875
 committee reports 873
 department of H C Christensen 872
 district meetings 674 731
 executive committee report 873
 joint sessions with A A C P 519
 officers 527 731
 program 517 578 731
 resolutions committee 873
 National Association of Drug Clerks Inc to be dissolved 80
 National Association of Insecticide and Disinfectant Manufacturers 732
 National Association of Retail Druggists 732 825
 officers 934
 National Committee on Professional Information Pertaining to Dental Pharmacy 878 921
 National Conference of Pharmaceutical Research 433
 officers 527 579
 program 579 731
 National Drug Code Authority 530
 National Editorial Association golden anniversary 437
 National Food and Drug Legislation R W Clark 490
 National Formulary 1051 1108
 bulletins 693 697
 color of cover and label 1035 1036
 complimentary copies 1112
 contract for printing and binding 685 686
 distribution and sale of 681
 exhibit at American Medical Association convention 520
 Adley B Nichols 520
 new E G Eberle 1048 1051
 price 1107
 publicity 694

committee Maryland 434
 successful application of in a retail pharmacy L S Williams 395
 report of Committee on 700
 use of text 164 106 426 512 581 583 682 1034 1035 1036 1107
 value of tulu coating F S Bukey and Marjorie Brew 291
 VI 1044 1108
 binding 1107
 color of cover and label 1035, 1036
 complimentary and review copies 1112
 copy for official coupon 1034 1035
 official date 1034 1035 1036
 use of text of 512 581 583 682 1034 1035 1036 1107
 National Pharmacy Week 727
 executive committee Chairman Anton Hogstad 181
 window display contest committee 1033
 National Recovery Administration 248 435 437
 Board headed by Richberg 248
 appointed Dr Gustav Peck 85
 ends multicode rules 83
 for 298
 policy new of publicizing drug code violations 85
 revision of recommendation 84
 National unity of state cooperation between pharmacist physician and dentist George C Schicks 1083
 National Wholesale Druggists Association 519 825 933
 Nau Frank A given special resolution of appreciation 821
 Naval Hospital 337
 Nearer and nearer to convention time 441
 Necrology 86 170 250 337 431 586 729 931 1041
 Biddle Henry C 931
 Blaney Charles M 170
 Breasted James H 1123
 Buckland Thomas A 1042
 Cliffe W L 170
 Crouse William Livingston 1041
 Cuddyer P J 81
 de Vries Hugo 526
 Dohme C Louis 1042
 Dorset Marion 586
 Dow Joseph H 86
 Dunsberg Dr Carl 931
 Emde Hermann 729
 Fricke Frederick H 1041
 Godbold Mrs F C 325
 Golaz Henry 729
 Greene Antoine E 1123
 Highley L E 931
 Hindes Joseph F 1041
 Hommell P E 729
 Irvine E D 170
 Judd Edward Starr 1042
 Kantrowitz Hugo 87
 Kelly Hon Clyde 432
 Kennedy Ezra J 250
 Kilmer F B 86
 Kolle Dr Wilhelm 432
 Lampa Robert R 431
 Little Arthur D, 729
 Meissner Frederick W 1123
 Michel W F 600 824
 Michels John B 1123
 Ochs Adolph S 337
 Potts Thomas 732
 Ridgely Edgar A 170
 Sheely Edward V 824
 Schoenthaler John F 432
 Shurtleff Israel H 87
 Simpkins Harold W 586
 Van Schaack C R 586
 Walker Walter Treat 931
 Walton L L 1123
 Williams L S 431
 Wilson Smith C 86
 Windolph J Fred 1041
 Nelson Dr Erwin E principal pharmacologist Food and Drug Administration 79
 New Jersey Board of Pharmacy 80
 New Jersey intends to make Practice Experience mean something 523
 Newton H C at Massachusetts College of Pharmacy 707
 New York Fair Trade Act held unconstitutional 1045
 New York Pharmaceutical Council 338
 New Zealand Pharmaceutical Conference 152
 Nichols Kenneth new secretary of Missouri Pharmaceutical Association 430
 Nicklin Walter S Jr won Kalusowski prize at George Washington University 525

Nielsen Svend reprint donated on Amerikanske Apotekforhold 81
 Niemiec Thaddeus given recognition 928
 Nomenclature of the arsenic compounds 454
 Nomination of Honorary President Secretary and Treasurer of the Association 702
 Nominees for A Ph A officers 36-37 727 912
 presidency reduction in 702 1110
 Non heptane constituents of Digger Pine (*Pinus serotina*) Arthur H Uhl 380
 Northwest Pharmaceutical Bureau 252
 Note on action of alkalies and alkali salts on anti pyrine Loyd E Harris and Ercell D Tebow 1069
 Note on assay of mass of ferrous carbonate J C Krantz Jr and C Jelleff Carr 948
 Notice to contributors to the JOURNAL OF A Ph A 90 178 256 344 440 532 600 828
 Notices Committee on Transportation T J Bradley 182 306 350
 Notz Wm F deceased June 4th 525
 Noves Wm A received Priestley medal 728

O

Officers

ASSOCIATION 587
 elect 587 1071
 Baltimore Branch 71
 Chicago Branch 72
 Conference Pharmaceutical Association Secretaries 731 922
 Council 705 912
 D C Association 730
 elect A Ph A 1936-1937 1071
 Historical Section 921
 House of Delegates 658
 Insecticide Disinfectant Association 81
 Japan Pharmacists Union 174
 N A B P 731
 N A R D 934
 N W D A 933
 National Conference on Pharmaceutical Research 731
 New York Branch 162
 Northern Ohio Branch 76
 Philippine Pharmaceutical Association 173
 Plant Science Seminar 1021
 Proprietary Association 519
 Scientific Section 921
 Section on Education and Legislation 922
 West Virginia Association 730
 Ohio state uniform narcotic drugs act 1044
 Oil of lemon 785
 of rose 786
 phenolated 841
 shark liver W S Jones and W G Christiansen 295
 Oklahoma health education 523
 Oklahoma Pharmacy Alumni elect officers 531
 Olsen Paul C made study of results of stabilization in typical city retail drug store 430
 O'Neill James L
 administrator of new NRA 532 707
 Opium assay observations on Joseph Rosin and C J Williams 1053
 Opium traffic in and other narcotics 1043
 Oregon trail 535
 Organic acids salts of assay methods for 11
 Organic chemicals 882
 Organs whole the culture of 526
 Ortho aminophenol acyl derivatives of C B Pollard and W T Forsee 363

P

Panels sculptural A I P 939
 Papers section and conference for the Portland meeting A Ph A 171
 12th international congress of pharmacy 1113
 Paregoric ruling 730
 Partial list of papers of the sections conferences etc 515
 Patent medicines J Hampton Hoch 145
 Patents early 488
 Peacock J C Mr and Mrs projection apparatus 809
 Pearson Wm A received honorary degree of Master of Pharmacy 525
 Peck Gustav appointment by National Industrial Recovery Board 86
 Pentobarbital sodium detoxification of strychnine E E Swanson 959
 Percolation of belladonna root with various alcohol water mixtures 448
 Perry Roy A advocates Back to Pharmacy movement 707

Personal and News Items 79 169 250 337 430 524
 585 728 824 1040 1124
 Personnel changes in Swedish pharmaceutical circles 823
 Petrolatum its composition 323
 pH and stability of galenical preparations 408
 pH and stability of miscellaneous organic compounds 502
 Pharmaceutical
 abstracts (page 1 March issue) 1 33 69 105 141 177 213 253 293 333
 education 1093
 formulas 695
 Journal expressed loyalty and congratulations to King George on Silver Anniversary 430
 mathematics some observations after twenty five years experience in teaching Edward Spease 227
 profession proposals affecting in P I 173
 service in the Army 428 916
 study of pH Frederick F Johnson 397 498 505
 bibliography 505
 Pharmacist and podiatrist W F Ambroz 774
 professional relationship of to medical sciences 1092
 studies law Charles G Ajax 863
 Pharmacognosists American eminent of the 19th century Heber W Youngken 148 215
 Pharmacognosy
 course content of George W Fiero 1095
 teaching of habitats in Elmer H Wirth 413
 Pharmacological and vitamin laboratory 725
 Pharmacopoeia
 and National Formulary E G Eberle 941
 Aztec Badianus manuscript Emily Walcott Em mart 771
 esperanto 993
 international 728
 Massachusetts Medical Society 941
 new F F Cook 1050 1098
 New York Hospital 941
 U S (see U S P)
 Pharmacy American who speaks for 927
 and the government 902 1124
 and public health R P Fischels 927
 curriculum place of commercial subjects in Neal B Bowman 987
 in Japan 585
 in Shanghai 1046
 professional foresight in F J Stuhr 1092
 recognized legally as a profession in California 933
 should protect right to exist Millard E Tydings 1043
 theory of and academic standards
 Briggs W Paul 153
 Burlage H M 156
 Langenhan H A 158
 Pharmacy week Anton Hogstad Jr 181 257
 week 330 1041
 in daily press 930
 in Philadelphia 306
 issue of *Druggists Circular* 929
 window displays 732
 Phenol camphorated 842
 glycerite of 841
 ointment 842
 Phi Delta Chi 81 172
 Philip W B guest of Chicago Veteran Druggists Association 430
 Photo Annual meeting Boards and Colleges of Pharmacy District No 2 at A I P 314
 Badianus manuscript 928
 Bastin Edison S 151
 Calomel 99 100 101
 Costello P H 658
 Crater Lake in Crater Lake National Park is known as one of the Seven Wonders of the World 493
 crude drug stock found infested by drug store beetle 287
 crude drug stock infested by square necked grain beetle 287
 Delgado F A 658
 Diehl C Lewis 1049
 Dohme Charles F 520
 drug containers 288
 drug store beetle 287
 Fder Robert at U of Minn 1122
 effects of umbellulone 203 204 205
 equipment at Apothecaries Hall 163
 ergot alkaloid effect of 109 188
 Evans C H 673
 Facsimile of the first page of the Badianus manuscript 772
 first class of pharmacists to graduate from any University in China 866

- Fischels Robert P 635
 group of A Pitt A members and members of their families in Portland Ore 733
 Hayman J Lester 658
 Henshaw David 858
 Hilton S L 730 925
 home of Carl Linnaeus and museum 674
 Hume C F delegate's badge 1113
 Indian medicine man 222
 Kraemer Henry 216
 Leaf from waste book of Charles Marshall 303 304
 Little Ernest 659
 Marsch John M 148
 Memorial plaque honoring Dean C B Jordan 314
 Mortars and pestles and drug jars purchased by J Leon Lascoff from the Wamamaker collection 396
 Mount Hood 179
 Myrtle tree 107
 National Formulary (1048) exhibit at A M A convention 320
 panel Pharmakentike 938
 Phos Kai Lips 937
 pharmacists at 50th anniversary celebration of Institute of Pharmacy University of Liege 60
 physiological pu 400
 plantago 208 209 210 211
 Portland A Pitt A convention committee 464
 prescription department of L S Williams Pharmacy Baltimore 425
 prize winning pharmacy week window 96
 public health service building 1
 Remington medal 925
 Rice Charles 1049
 room in the shrine to the birth of modern botany 634
 Savre Lucius E 218
 Schlotterbeck Julius O 151
 Schneider Albert 215
 schneiders presented to H C Christensen Julius Riemschneider and Frank A Kirby 928
 Spalding Lyman 1049
 square necked grain beetle 286
 suggestions for managing a case of cyanide poisoning 638
 testimonial dinner to Dr R P Fischels 69
 tri state association banquet at Portland Idaho Oregon and Washington groups 829
 tri state window display of pharmacist Frank Nau Portland Ore 944
 upper part of cover of waste book of Charles Marshall 302
 U S P XI 1047
 view of the Columbia River and gorge 533
 Wall Otto A 219
 window arranged by Frank Nau 834
 Winkler Ludwig 601
 witch hazel flowers 223
 Zenty Ferdinand 672
 Physiological pu 400
 Phytochemical notes
 Eppson Harold 113
 Gisvold Ole 214 290
 Semb Joseph 609
 Xavier Sister M Francis 539
 Phytochemical study of the seed of the digger pine Joseph Semb 609
 Phyto Pharmacy 827
 Picrotoxin 266 622
 action of on mice 622
 Pittsburgh College Alumni meeting 343
 Plan for pharmacy internships at the University of Michigan hospitals Harvey A K Whitney and E C Watts 852
 Plant Science Seminar meeting 251 345 443 580 1020
 officers 443 1021
 Plaques presentation of 875
 Play based on life of Semmelweis 249
 Poisoning case reported 429
 Poisons list section new to the British 585
 Poley Warren H honored guest at Founders Day Philadelphia College 337
 Popular Journal 702
 Potassium guaiacoli sulphate A H Clark and Ernst Kirch 564
 Potent medicaments in sugar coated pills and in confections John F Suchy 1081
 Pottery Hebrew found in Lachisch of the Canaanites 249
 Preliminary chemical examination of Corydalis Aurea Harold Eppson 113
 Preparation and properties of 3 3 Bis(Azometa Phenylendiamine) 4 4 Dihydroxyarsenobenzene and 3 3' Bis(Azo 2 6 Diaminopyridine) 4 4' Dihydroxyarsenobenzene A I Jurist and W G Christensen 457
 Prescription departments in 1895 599
 open note on J Norman Salsby 133
 partially open furthering pharmaceutical publicity through W Bruce Philip 224
 visible George W Pico 973
 Prescriptions relief by states 714
 Presentation gold watch to Dr Fischels R A Lyman 820
 scroll to H C Christensen 817
 Preservation halibut liver oil with hydroquinone W S Jones and W G Christiansen 465
 Preservatives
 newer used in pharmacy 929
 Print bill from pharmacy of J B Caventou 385
 Printing and binding Recipe Book II 581
 Prize Kalusowski Walter S Nicklin Jr won at George Washington University 525
 membership in A Pitt A 524
 (see Ebert Remington)
 Problems of teachers and state board examiners Harry W Mantz 206
 Procaine and tutocaine 266
 Proceedings of Local Branches 70 160 232 315 420 494 522 822 924 932 1027 1032 1100
 Proceedings 1935 meeting summary of 778
 Professional outlook L M Kanter 134
 Professional pharmacy second edition 184 1033
 Professional relationship of pharmacist to medical sciences 1092
 Profit the way out of the depression W Bruce Philip 208
 Program American Association Colleges of Pharmacy 577
 American Association for Advancement of Science 328
 AMERICAN PHARMACEUTICAL ASSOCIATION 512 587
 Conference Pharmaceutical Association Law Enforcement Officials 595
 Conference Pharmaceutical Association Secretaries 594
 Council 587
 division of medicinal chemistry 343
 general for 83rd annual meeting 513 514 583 587
 House of Delegates 587
 joint session Scientific Section and Section on Practical Pharmacy and Dispensing 590
 N A B P 517 578
 National Conference on Pharmaceutical Research 527 579
 Plant Science Seminar 580
 Sections 587
 Commercial Interests 593
 Education and Legislation 592
 Historical Pharmacy 594
 Practical Pharmacy and Dispensing 591
 Scientific 589
 social security 78
 standard committee on 700
 Proposed publication 704 1109
 Proprietary Association scientific section of 701
 Psidium seed further studies on H W Youngken 207
 Public Health Council of Kansas 78
 professorship 168
 service 168
 Publication proposed 1109
 Pyman Frank Lee Hanbury medalist for 1936 728
 Pyrethrum cotton stripper tested in harvesting 823
- Q
- Quake injuries 1040
 Question of assaying ergotocin the new ergot principle Edward E Swanson Chester C Hargreaves K K Chen 835
 Quinine and quinidine 266
- R
- Raids narcotic 248
 Ransom Col Charles surgeon general of the army 430
 Rates hotel at Portland 531
 Ratios Wisconsin drug stores when pharmacy law was passed and now 1112
 Reagents laboratory 696
 Receipts of Secretary's Office and the sales of N F and R B 904
 Recipe Book 681 686
 committee on 694

Nielsen Svend reprint donated on Amerikanske Apotekaforhold 81
 Niemiec Thaddeus given recognition 928
 Nomenclature of the arsenic compounds 454
 Nomination of Honorary President Secretary and Treasurer of the Association 702
 Nominees for A Ph A officers 36-37 727 912
 presidency reduction in 702 1110
 Non heptane constituents of Digger Pine (*Pinus sabina*) Arthur H Uhl 380
 Northwest Pharmaceutical Bureau 252
 Note on action of alkalies and alkali salts on antipyrine Loyd E Harris and Erce D Tebow 1069
 Note on assay of mass of ferrous carbonate J C Krantz Jr and C Jelleff Carr 948
 Notice to contributors to the JOURNAL OF A Ph A 90 178 256 344 440 532 600 828
 Notices Committee on Transportation T J Bradley 182 306 350
 Notz Wm F deceased June 4th 525
 Noyes Wm A received Prestley medal 728

O

Officers

ASSOCIATION 587
 elect 587 1071
 Baltimore Branch 71
 Chicago Branch 72
 Conference Pharmaceutical Association Secretaries 731 922
 Council 705 912
 D C Association 730
 elect A Ph A 1036-1037 1071
 Historical Section 921
 House of Delegates 658
 Insecticide Disinfectant Association 81
 Japan Pharmacists Union 174
 N A B P 731
 N A R D 934
 N W D A 933
 National Conference on Pharmaceutical Research 731
 New York Branch 162
 Northern Ohio Branch 76
 Philippine Pharmaceutical Association 173
 Plant Science Seminar 1021
 Proprietary Association 519
 Scientific Section 921
 Section on Education and Legislation 922
 West Virginia Association 730
 Ohio state uniform narcotic drugs act 1044
 Oil of lemon 785
 of rose 786
 phenolated 841
 shark liver W S Jones and W G Christiansen 295
 Oklahoma health education 523
 Oklahoma Pharmacy Alumni elect officers 531
 Olsen Paul C made study of results of stabilization in typical city retail drug store 430
 O'Neill James L
 administrator of new NRA 532 707
 Opium assay observations on Joseph Rosin and C J Williams 1053
 Opium traffic in and other narcotics 1043
 Oregon trail 535
 Organic acids salts of assay methods for 11
 Organic chemicals 882
 Organs whole the culture of 526
 Ortho aminophenol acyl derivatives of C B Pollard and W T Forsee 363

P

Panels sculptural A I P 939
 Papers section and conference for the Portland meeting A Ph A 171
 12th international congress of pharmacy 1113
 Paregoric ruling 730
 Partial list of papers of the sections conferences etc 515
 Patent medicines J Hampton Hoch 145
 Patents early 488
 Peacock J C Mr and Mrs projection apparatus 809
 Pearson Wm A received honorary degree of Master of Pharmacy 525
 Peck Gustav appointment by National Industrial Recovery Board 86
 Pentobarbital sodium detoxification of strychnine E E Swanson 959
 Percolation of belladonna root with various alcohol water mixtures 448
 Perry Roy A advocates Back to Pharmacy movement 707

Personal and News Items 79 169 250 337 430 524
 585 728 824 1040 1124
 Personnel changes in Swedish pharmaceutical circles 823
 Petrolatum its composition 323
 pH and stability of galenical preparations 498
 pH and stability of miscellaneous organic compounds 502
 Pharmaceutical
 abstracts (page 1 March issue) 1 33 69 105 141
 177 213 253 293 333
 education 1093
 formulas 695
 Journal expressed loyalty and congratulations to King George on Silver Anniversary 430
 mathematics some observations after twenty five years experience in teaching Edward Spease 227
 profession proposals affecting in P I 173
 service in the Army 428 916
 study of pH Frederick F Johnson 397 498 505
 bibliography 505
 Pharmacist and podiatrist W F Ambroz 774
 professional relationship of to medical sciences 1092
 studies law Charles G Ajax 863
 Pharmacognosists American eminent of the 19th century Heber W Youngken 148 215
 Pharmacognosy
 course content of George W Fiero 1095
 teaching of habitats in Elmer H Wirth 413
 Pharmacological and vitamin laboratory 725
 Pharmacopoeia
 and National Formulary E G Eberle 941
 Aztec Badianus manuscript Emily Walcott Em mart 771
 esperanto 993
 international 728
 Massachusetts Medical Society 941
 new F F Cook 1050 1098
 New York Hospital 941
 U S (see U S P)
 Pharmacy American who speaks for 927
 and the government 902 1124
 and public health R P Fischelis 927
 curriculum place of commercial subjects in Neal B Bowman 987
 in Japan 585
 in Shanghai 1046
 professional foresight in E T Stuhr 1092
 recognized legally as a profession in California 933
 should protect right to exist Millard E Tydings 1043
 theory of and academic standards
 Briggs W Paul 153
 Burlage H M 156
 Langenhan H A 158
 Pharmacy week Anton Hogstad Jr 181 257
 week 330 1041
 in daily press 930
 in Philadelphia 306
 issue of *Druggists Circular* 929
 window displays 732
 Phenol camphorated 842
 glycerite of 841
 ointment 842
 Phi Delta Chi 81 172
 Philip W B guest of Chicago Veteran Druggists Association 430
 Photo Annual meeting Boards and Colleges of Pharmacy District No 2 at A I P 314
 Badianus manuscript 928
 Bastin Edson S 151
 Calomel 99 100 101
 Costello P H 658
 Crater Lake in Crater Lake National Park is known as one of the Seven Wonders of the World 493
 crude drug stock found infested by drug store beetle 287
 crude drug stock infested by square necked grain beetle 287
 Delgado F A 658
 Diehl C Lewis 1049
 Dohme Charles E 526
 drug containers 288
 drug store beetle 287
 Eder Robert at U of Minn 1122
 effects of umbellulone 203 204 205
 equipment at Apothecaries Hall 163
 ergot alkaloid effect of 109 188
 Evans C H 673
 Facsimile of the first page of the Badianus manuscript 772
 first class of pharmacists to graduate from any University in China 866

- Fischelis Robert P 635
group of A Pitt A members and members of their families in Portland Ore 733
Hayman J Lester 658
Henshaw David 858
Hilton S L 336 925
home of Carl Linnaeus and museum 634
Hume C F delegate's badge 1113
Indian medicine man 222
Kraemer Henry 216
leaf from waste book of Charles Marshall 303 301
Little Ernest 659
Marsch John M 148
Memorial plaque honoring Dean C B Jordan 314
Mortars and pestles and drug jars purchased by J Leon Jascoff from the Wanamaker collection 396
Mount Hood 179
Myrtle tree 197
National Formulary (1948) exhibit at A M A convention 320
panel Pharmaceutice 938
Phos Kai Lipis 937
pharmacists at 50th anniversary celebration of Institute of Pharmacy University of Liege 60
physiological pH 400
plantago 208 209 210 211
Portland's A Pitt A convention committee 464
prescription department of L S Williams Pharmacy Baltimore 425
prize winning pharmacy week window 96
public health service building 1
Remington medal 925
Rice Charles 1049
room in the shrine to the birth of modern botany 634
Sayre Lucius E 218
Schlotterbeck Julius O 151
Schneider Albert 215
scroll presented to H C Christensen Julius Riemenschneider and Frank A Kirby 928
Spalding Lyman 1049
square necked grain beetle 286
suggestions for managing a case of cyanide poisoning 628
testimonial dinner to Dr R P Fischelis 69
tri state association banquet at Portland Idaho Oregon and Washington groups 829
tri state window display of pharmacist Frank Nau Portland Ore 944
upper part of cover of waste book of Charles Marshall 302
U S P XI 1047
view of the Columbia River and gorge 533
Wall Otto A 219
window arranged by Frank Nau 834
Winkler Ludwig 601
witch hazel flowers 223
Zienty Ferdinand 672
Physiological pH 400
Phytochemical notes
Eppson Harold 113
Gisvold Ole 214 290
Semb Joseph 609
Navier Sister M Francis 539
Phytochemical study of the seed of the digger pine Joseph Semb 609
Phyto Pharmacy 827
Picrotoxin 266 622
action of on mice 622
Pittsburgh College Alumni meeting 343
Plan for pharmacy internships at the University of Michigan hospitals Harvey A K Whitney and E C Watts 852
Plant Science Seminar meeting 251 345 443 580 1020
officers 443 1021
Plaques presentation of 875
Play based on life of Semmelweis 249
Poisoning case reported 429
Poisons list section new to the British 585
Poley Warren H honored guest at Founders Day Philadelphia College 337
Popular Journal 702
Potassium guaicol sulphonate A H Clark and Ernst Kirch 564
Potent medicaments in sugar coated pills and in confections John F Suchy 1081
Pottery Hebrew found in Lachisch of the Canaanites 249
Preliminary chemical examination of Corydalis Aurea Harold Eppson 113
Preparation and properties of 3 3' Bis(Azometa Phenylendiamine) 4 4 Dihydroxyarsenobenzene and 3 3' Bis(Azo 2 6 Diaminopyridine) 4 4' Dihydroxyarsenobenzene A I Jurist and W G Christensen 457
Prescription departments
in 1895 699
open note on J Norman Salsby 133
partially open furthering pharmaceutical publicity through W Bruce Philip 224
visible George W Liero 973
Prescriptions relief by states 714
Presentation gold watch to Dr I Fischelis R A Lyman 820
scroll to H C Christensen 817
Preservation inhibit liver oil with hydroquinone W S Jones and W G Christiansen 465
Preservatives
newer used in pharmacy 929
Print bill from pharmacy of J B Caventon 385
Printing and binding Recipe Book II 581
Prize Kalusowski Walter S Nicklin Jr won at George Washington University 525
membership in A Pitt A 521
(see Thert Remington)
Problems of teachers and state board examiners Harry W Mantz 296
Procaine and tutocaine 266
Proceedings of Local Branches 70 160 232 315 420 494 522 822 924 932 1027 1032 1100
Proceedings 1935 meeting summary of 778
Professional outlook I M Kantner 174
Professional pharmacy second edition 184 1033
Professional relationship of pharmacist to medical sciences 1092
Profit the way out of the depression W Bruce Philip 298
Program American Association Colleges of Pharmacy 577
American Association for Advancement of Science 328
AMERICAN PHARMACEUTICAL ASSOCIATION 512 587
Conference Pharmaceutical Association Law Enforcement Officials 595
Conference Pharmaceutical Association Secretaries 504
Council 587
division of medicinal chemistry 343
general for 83rd annual meeting 513 514 583 587
House of Delegates 587
joint session Scientific Section and Section on Practical Pharmacy and Dispensing 590
N A B P 517 578
National Conference on Pharmaceutical Research 527 579
Plant Science Seminar 580
Sections 587
Commercial Interests 593
Education and Legislation 592
Historical Pharmacy 594
Practical Pharmacy and Dispensing 591
Scientific 589
social security 78
standard committee on 700
Proposed publication 704 1109
Proprietary Association scientific section of 701
Psyllium seed further studies on H W Youngken 207
Public Health Council of Kansas 78
professorship 168
service 168
Publication proposed 1109
Pyman Frank Lee Hanbury medalist for 1936 728
Pyrethrum cotton stripper tested in harvesting 823
- Q
- Quake injuries 1040
Question of assaying ergotocin the new ergot principle Edward E Swanson Chester C Hargreaves K K Chen 835
Quinine and quinidine 266
- R
- Raid narcotic 248
Ransom Col Charles surgeon general of the army 430
Rates hotel at Portland 531
Ratios Wisconsin drug stores when pharmacy law was passed and now 1112
Reagents laboratory 696
Receipts of Secretary's Office and the sales of N F and R B 904
Recipe Book 681 686
committee on 694

- printing and binding 681
 sales of 908
 Recognition of outstanding services for pharmacy at
 Century of Progress Exhibition 928
 Recommendations 1-17 submitted by President
 Fischelis 653 708 1111
 Red Cross roll call 928
 Registrants Portland meeting 679
 Regulations general series 4 Federal Alcohol Control
 Administration 63
 Relation of A Ph A to National Drug Trade Con-
 ference 329 331
 Remington medalist S L Hilton 336
 award and dinner 822 925 1031
 Report
 auditor's 426
 Board of Review of Papers Scientific Section F E
 Bibbins 996
 chairman's address Practical Pharmacy and Dis-
 pensing 1006
 (see Officers Associations Sections)
 Committee
 cooperation with hospital pharmacists R W
 Rodman 1009
 development of pharmacy laws R L Swain 920
 draft model restricting distribution of drugs and
 medicines to pharmacists W Bruce Philip 918
 Ebert prize 1000
 Education and Legislation
 Baltimore Branch A G DuMez 71
 New York Branch R S Lehman 73 239
 Endowment Fund James H Beal 918
 Fairchild scholarship 678
 finance 1107
 horticultural nomenclature H W Youngken 911
 1021
 maintenance H A B Dunning 329 808
 National Pharmaceutical Syllabus J G Beard
 911
 National Pharmacy Week executive 1023
 Nominations R C Wilson 912
 Baltimore Branch Simon Solomon 71
 pharmaceutical nomenclature A G DuMez 911
 pharmacy corps in U S Army E H Kendig 914
 Pharmacy Week E F Kelly 911
 prerequisite legislation C B Jordan 913
 Procter Wm Jr Memorial Fund James E
 Hancock 911 1023
 proposed national pharmacy on professional rela-
 tions pertaining to dentistry George C Schicks
 1008
 publication 329
 resolutions 708 876
 science and practice of pharmacy Baltimore
 Branch R S Fuqua 71
 state codes and committee on code matters E F
 Kelly 923
 student branches Adolph Zieffle 911
 study of pharmacy R P Fischelis 912
 to A Ph A Council on suggestion to establish a
 national council on pharmaceutical practice as
 an activity of A Ph A E F Cook 64
 transportation Theodore J Bradley 912 1026
 twelfth international congress of pharmacy
 E Hume 1113
 weights and measures Costello P H 911 1023
 Fischelis R P 334
 Conference on Pharmaceutical Association Secre-
 taries C J Clayton 922
 Council E F Kelly 894 912
 special 329
 councilor to American Association for Advancement
 of Science from A Ph A J C Krantz Jr 909
 delegate to National Drug Trade Conference R P
 Fischelis 913
 delegate of Scientific Section F E Bibbins 920
 exhibit at World's Fair 817
 historian E G Eberle 1014
 House of Delegates Rowland Jones 816
 Indiana Pharmaceutical Association F V Mc
 Cullough 911
 National Drug Trade Conference R P Fischelis
 911
 Secretary E F Kelly 900
 Section
 education and legislation Rising L W 1008
 Schicks George C 921
 historical H W Youngken 921 1014
 practical pharmacy and dispensing Clark R W
 922
 Richards Leon W 1004
 scientific F E Bibbins 996
 Special Committee on Council on Pharmaceutical
 Practice E F Cook 811
 Treasurer A Ph A C W Holton 598
 U S P 11th revision E F Cook 796
 committee 334 520 708 1021
 monthly on retail drug store sales 826
 Representation A Ph A on National Retail Drug
 Code Authority 329
 Research census of 433
 committee 702
 pharmaceutical bibliography of A G DuMez 40
 117 167
 national conference of 433
 Resignation of E F Cook as candidate for presidency
 804 876
 Resolutions
 and recommendations adopted by A Ph A at
 Portland Ore 707-715
 by Izziary R L of the Porto Rico Association 911
 Food and Drug officials R P Fischelis 529
 historical section 911 1014
 licensing all manufacturers of drugs and medicines
 913
 N A R D commending E F Kelly 1110
 restricting sale of drugs and medicines 913
 Results and topics of the 12th international congress
 of pharmacy 1114
 Retail Drug Code Authority permitted by amendment
 to incorporate 226
 Retail ethics higher 826
 Reynolds Major General Charles R 476
 Rhizomes of Iris versicolor L and Iris virginica L
 George M Hocking 17
 Rho Chi Society 932
 Rice Charles 1049
 Riemenschneider Julius given recognition 928
 Ring worm infections preparations used in treatment
 of 777
 Rising Louis Wait at Washington University 79
 Robinson Dr Benjamin Lincoln 832
 Rogers C H American Contemporaries 79
 Rojahn Carl August frontispiece and sketch 830-831
 honorary member 898
 Rubefacient pigment 214
 Russian ergot H H Rusby 382
 S
 Sale and exchange of liberty bonds 511
 Salicylate ammonium sodium 13
 Saliva tests 111 Detecting the administration of
 some opium derivatives to horses James C Munch
 557
 Sapo Mollis U S P IX 1080
 Sayre Lucius E sketch 217
 Schaefer H H member committee proprietary medi-
 cines 1110
 Schneider Albert sketch 215
 Schools of pharmacy Japanese 436
 Searle Mr and Mrs C H business trip to Honolulu
 Japan China P 1 79
 Section
 Commercial Interests 516
 Education and Legislation 1007
 resolution 1086
 Historical Pharmacy 172 516 1012
 resolutions 911
 Practical Pharmacy and Dispensing 428 516 1002
 1108
 partial list of papers 516 705
 Scientific 6 97 185 262 351 446 515 538 607
 742 835 945 994
 of Proprietary Association 519
 Sections 955
 12th international congress of pharmacy 1113
 Sections and Conferences papers at Portland meeting
 527
 Service intelligent 927
 Seventh American Scientific Congress 728
 Sheely Edward V 343
 Signs drug store identify establishment 84
 Simplified assay for official iodine iodide solutions
 Wm F Reindollar 756
 Skin stimulants 777
 Smith A Homer frontispiece and sketch 92
 Societies and Colleges 80 171 251 338 433 527 587
 825 932 1042
 Society Austrian Pharmaceutical 168
 History of Science 1097
 Sodium benzoate salicylate 13
 Solubility of chlorine in heptane at different tempera-
 tures 550
 halogens in heptane Joseph Semb 547
 Solution of iron and ammonium acetate U S P X
 stabilization of Wm J Husa and Lyell J Klotz
 125
 cresol 966 1077

Spalding Lyman 1019
 Specificity of mouse tests for detection of doped horses 559
 Stabler I leadbeater apothecary shop plans for restoration 810
 Standards pharmaceutical 732
 State
 cooperation pharmacists physicians dentists 1083
 State Board examiners and teachers problems Harry W Mantz 296
 Kentucky 771
 requirements 932
 State Pharmaceutical Associations
 Alabama 325 529 596
 Arizona 1012
 officers 1012
 Arkansas 325 596
 California 314 325 596
 Colorado 325 596
 Connecticut 325
 Delaware 599 933
 bulletin 933
 Fair Trade Law 599
 District of Columbia 338 434 1042 1124
 Florida 325 529
 Georgia 325 529
 Idaho 325 933 1042
 bulletin 933
 Illinois 325 529 599
 Fair Trade Act 599
 Indiana 325 596
 Iowa 251
 Kansas 325 434
 officers 434
 Kentucky 325
 Louisiana 529
 Maine 173 325
 Maryland 434 596
 Massachusetts 325
 Michigan 325 597
 Minnesota 252 434
 officers 434
 Mississippi 325 597
 Missouri 325
 Montana 325 825
 Nebraska 173 825
 New Hampshire 325 597
 New Jersey 625
 New Mexico 325
 New York 325
 North Carolina 173 325 529
 North Dakota 252 325 597
 Ohio 325
 Oklahoma 81 325
 Oregon 325 707
 Pennsylvania 325
 Porto Rico 173
 Rhode Island 81 325
 South Carolina 325 529
 Tennessee 325 434 586
 Texas 325 529
 tri state meeting 604 822
 Utah 325 345
 Vermont 325 597
 Virginia 599
 Washington 325 707
 West Virginia 325 529 730 932
 Wisconsin 147 252 325 825 597
 Wyoming 325
 Statistical study of records of same class in botany and pharmacognosy Marin S Dunn 991
 Sterilization 696
 Sterols from monarda fistulosa Ole Grisvold 214 1071
 from pinus sabiniana Ole Grisvold 290
 Stewart F E honored guest at Founders Day Phila delphia College 337
 Stoughton's elixir stomachicum 147
 Strychnine detoxification of by pentobarbital sodium E E Swanson 959
 oral lethal dose of for rodents 623
 sulphate 266
 adsorption of by various charcoals and by Lloyd's reagent J F Suchy and R V Rice 120
 Students auxiliary University of Maryland organized 1101
 Studies on barbiturates XI Further contributions to methods of barbituric research C R Linegar James M Dille Theodore Koppanyi 847
 Study
 germicidal and antiseptic activity of some mercury compounds E Moness S E Harris and W G Christensen 386
 of anesthetic properties of trichlorethylene J C Krantz Jr C Jelleff Carr Ruth Musser 754

of assay of aconite and stability of its preparations 741
 of U S P thyroid assay George D Beal and Chester R Szalkowski, 742
 pharmacological and chemical M R Thompson 186
 vehicles for medicines Bernard Fantus H A Dyne wicz and J M Dymiewicz 40
 Sugar coatings pills confections 1081
 Suggestions for improvement of professional relations between dentists and pharmacists C L Whitman 392
 Sulphide analogues of azo dyes having bactericidal properties W Braker and W G Christiansen 607
 Sulphur ointments and their assay C E Brady and Henry M Burlage 945
 Suppositoria glycerini 792
 Suppositories base for 78
 Swain Robert L reappointed on Maryland Board of Pharmacy 430
 Symposium on prescription pricing F C Felter 816
 Syrup cherry 48
 fruit 40
 hydrochloric acid stabilization of U S P Wm J Husa 45
 raspberry 48
 strawberry 48
 white pine compound 1079

T

Taub Harry chemical assays on fluidextracts of Russian ergot and Spanish ergot 384
 Tax commission refunds in Ohio 84
 excise continued for two years 584
 license West Virginia drug store upheld 84
 on toiletries 85
 Pennsylvania prescription upheld 83
 sales 253
 Teachers Conferences 731
 Technique improvement in preparation of three common products Edward D Davy 1079
 Telegrams read at Portland R B J Stanbury J U Lloyd Dr Edward Kremers 816
 Temple University 531
 Tercentenary chemistry 5 249
 Test for dead bacterial bodies 803
 Testimonial dinner to R P Fischelis President A Ph A 69
 S L Hilton 927
 Tests for redistilled water in N F VI monograph R S Adamson R K Snyder E N Gathercoal 800
 Texas Centennial Exposition, 1936 A Ph A at 1094
 Text N F use of V 164 166
 VI 682
 Thallium thallic qualitative detection of 353
 Theobromine 266
 Therapeutic substances derived from unsymmetrical diphenyl compounds III Some aryl esters of the hydroxy diphenyls S E Harris and W G Christiansen 553
 Therapy of Cook County Hospital Bernard Fantus 177
 Thoughts from an address before Wisconsin State Pharmaceutical Association Ralph M Carter 834
 Thyroid and hyperinsulinism 1046
 Thyroid assay U S P study of 742
 Thyroid iodine content of 747
 Tincture opium P L Burri and F E Bibbins 964
 Tolu coating value of U S P X and N F V F S Bukey and Marjone Brew 291
 Toxicity of aconitine to white rats 621
 Tri state pharmaceutical convention 729
 Twelfth International Congress of Pharmacy 226 275 909 1113

U

Umbellulone fungicidal action of in presence of protein 202
 germicidal action of 202
 some pharmacological and bactericidal properties of Miles E Drake and Ernst T Stuhr 196
 Unguentum 792
 U S Civil Service Examinations 78 249 727 1039
 U S patents granted for medicines during the pioneer years of the Patent Office Lyman F Kebleer 485
 U S P James H Beal 759
 U S P abstract of proposed changes with new standards and descriptions 11th revision E F Cook 716 784 787 878 882 1039
 and the Federal Food and Drugs Act James H Beal 739
 assay of opium differs from other lime assay methods 1053

botany and pharmacognosy 878
 new E G Eberle 1047 1049 1098
 new interim revision of ergot assay 5
 origin and method of revision of 759
 publicity committee Maryland 434
 publicity successful application of in retail pharmacy L S Williams 395
 report on 11th revision E F Cook 796
 should it be deleted from Federal Food and Drugs Act? 760
 should reference to in the Federal Food and Drugs Act be coupled with variation clause? 761
 standard for digitalis F A Upsher Smith 272
 thyroid assay study of George D Beal and Chester R Szalkowski 742
 titles used in taken from common language 765
 X stabilization of syrup of hydriodic acid Wm J Husa and Lyell J Klotz 45
 X value of Tolu coating F S Bukey and Marjorie Brew 291
 U S Public Health Service parts Surgeon Generals report to Congress 1934 91
 University of Buffalo planning Golden Jubilee 1936 1040
 University of Maryland School of Pharmacy 531
 Unusual mortar and pestle John E Kramer 574
 Unusual peppermint oil M Francis Xavier 539
 Urethanes study of a new series of W A Lott and W G Christiansen 22
 Urinalysis teaching to students of pharmacy Antoine E Greene 414
 Use of text N F V 164 166 426
 VI 512 581 583 682 1034 1035 1036

V

Variation clause in relation to delegation of legislative power 763
 necessary to permit improvement in pharmaceutical substances 763
 Variations in U S P percolation methods 538
 Vehicles for medicines study of Bernard Fantus H A Dyniewicz and J M Dyniewicz 46

Veterans of the Chicago and Milwaukee associations meet 932
 Visitors at A I P 431 525 824
 Vitamin A and D products W G Campbell 429
 A potency comparison of spectrometric method and antimony trichloride test for estimation of W S Jones and W G Christiansen 1072
 C easily destroyed 935
 Von Oettingen Dr Wolfgang Felix supervisor of Haskell Laboratory E I DuPont Co 79

W

Wall Otto A sketch of 218
 Wellcome Sir Henry decorated with Cross of Legion of Honor 79
 Wellcome Sir Henry S medal and prize 575 930
 Werner Harold W research in chemotherapy 525
 West Virginia University 434
 Wilson R C radio address—Narcotic Legislature 250
 Winkler Ludwig sketch 601
 Winne A L I visited city of Mexico 430
 Winthrop Chemical Co Inc acquired all assets of H A Metz Laboratories Inc 79
 Wisconsin drug show 825
 drug stores 1112
 Woodside John M received honorary degree of Master of Pharmacy from Philadelphia College of Pharmacy 525
 Wulling Frederick J radio talks 930
 tribute to 79 585

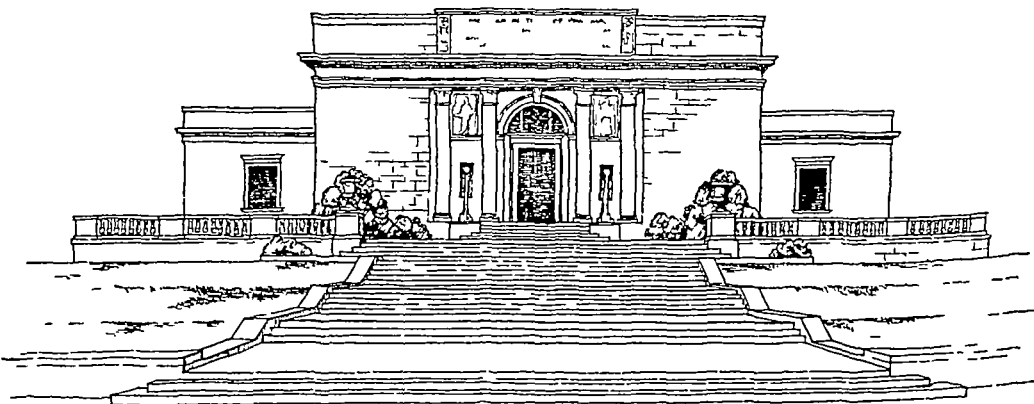
Y

YEAR BOOK 685 686 1109
 YEAR BOOK and Monthly Abstracts 929
 YEAR BOOKS donated to Congress 167 426 511
 Youngken H W Grand Regent of the Kappa Psi 707

Z

Zienty Frederick Fairchild Scholar 618
 Zinser Frederick G president of Sharp & Dohme 728

If item is not found under heading searched for in Authors or Subject Index please refer to Branches, Conferences Discussions, Minutes of foregoing Council Discussions, General Sessions House of Delegates Reports Committees Sections etc



ARTIST'S SKETCH OF THE AMERICAN INSTITUTE OF PHARMACY—WASHINGTON D C

PHARMACEUTICAL ABSTRACTS

EDITOR A G DuMEZ, 32 S Greene Street, Baltimore, Maryland

ABSTRACTORS

WILLIAM B BAKER	CLIFFORD S LEONARD
GERSTON BRUCH	L LAVAN MANCHEY
ARTHUR H BRIAN	ARTHUR E MEYER
HENRY M BURLAGE	A PAPINEAU COUTURE
ALBERT H CLARK	BERTRAN S ROBERTS
ZADA M COOPER	HARRY ROSEN
GUSTAV E C WALINA	A S SCHWARTZMAN
AMELIA DeDOMINICIS	EMANUEL V SHULMAN
MELVIN F W DUNKER	EDGAR B STARKEY
PERRY A FOOTE	MARVIN R THOMPSON
RALPH R FORAN	E G VANDEN BOSCHE
SAMUEL W GOLDSTEIN	GLENN S WEILAND
H B HAAG	ANNA E WHITE
WILLIAM H HUNT	ELMER H WIRTH
CASIMER T ICHNIOWSKI	THOMAS G WRIGHT
ROLAND E KREMERS	MAX M ZERVITZ

CONTENTS

Pharmacology, Toxicology and Therapeutics	
Therapeutics	34
New Remedies	
Synthetics	37
Specialties	37
Bacteriology	45
Botany	47
Chemistry	
General and Physical	47
Inorganic	47
Organic	
Alkaloids	48
Essential Oils and Related Products	49
Fixed Oils Fats and Waxes	50
Glycosides, Ferments and Carbohydrates	50
Other Plant Principles	53
Unclassified	54
Biochemistry	57
Analytical	62

THERAPEUTICS

Acetylbetamethylcholine Chloride—Use of, in Treatment of Neurogenic Bladder and Allied Conditions Preliminary favorable results of acetylbetamethylcholine chloride in a series of patients with neuropathic disturbances of the bladder indicate that this drug may be a valuable addition to the management of these conditions which have been proved very resistant to previous methods of treatment—J T GERNOW, E E EWERT and R D HERROLD *Med Rec* 141 (Feb 1935), 141 (B S R)

Adrenal Cortex Hormone—Effect of, on Hypertension and on Cardiovascular System In cases of hypertension, some complicated by cardiac arrhythmias the administration of adrenal cortex hormone resulted in an abrupt drop in blood pressure and in a clearing up of the arrhythmias—E M JOSEPHSON *Med Rec*, 141 (Mar 1935), 250 (B S R)

Benzylephedrine—Use of, as Analgesic in Chaulmoogra Injections A mixture containing 80-cc chaulmoogra oil, 20-cc olive oil and 0.1 Gm benzylephedrine base is used for intramuscular injection It is painless and has a tolerance 2-3 times that of ordinary chaulmoogra preparations—C T FANG *Chinese Med J*, 48 (1934), 563, cf *C A*, 24 (1930), 4855, through *Chem Abstracts*, 29 (1935), 289

Bismuth Violet—Use of, in Malaria and for Chancroids Approximately 4000 intravenous injections of bismuth violet were given in about 400 cases including all forms of malaria during the past four years Disappearance of the parasites was prompt and complete, with few recurrences A case is reported in which the local application of 0.4 per cent bismuth violet in 10 per cent glycerin aqueous solution and 1 per cent bismuth violet ointment to chancroids over the external genitalia and anus, was followed by prompt relief of pain, arrest of the infection and healing of the lesions On the thirteenth day all ulcers were healed, the inflammation and discomfort were gone and there was practically no scarring—C E WATSON *South Med Surg*, 97 (1935), 18 (S W G)

Burns The Dr E C Davidson treatment of burns with compresses of 5% tannic acid is discussed Burns are classified as (1) 1st and 2nd degree involving only the epidermis, (2) 3rd degree penetrating only to the upper layer of the corium, (3) 4th degree involving the subcutaneous tissues and (4) 5th and 6th degrees penetrating to the muscle and bone First degree burns such as a mild sunburn usually involve the upper layer of the epidermis in which the scales fall off in a short time, 2nd degree burns are generally characterized by the formation of blisters, 3rd degree burns are the most painful since they leave the nerve filaments bare and exposed Local treatment provides (1) relief by exclusion of air and the use of a local anesthetic and (2) prevention of infection in which tannic and picric acids are of great help Minor burns are treated by ointments, salves and oils because of their occlusive nature, for more severe burns liquids and powders are used Other medicaments are olive and cod liver oils, vaseline, lead carbonate, boric acid, sulphonated bitumen, bismuth subnitrate and subgallate, thymol iodide, iodoform, sodium bicarbonate, resorcinol, zinc oxide, acetanilid, paraffin, potassium permanganate, ferric chloride, aluminum subacetate, lead subacetate, alum and calamine—ANON *Drug and Cosmetic Ind*, 36 (1935), 271-272, 276, 284 (H M B)

Cevitamic Acid (Ascorbic Acid)—Use of, in the Treatment of Infantile Scurvy Three cases of infantile scurvy were treated with cevitamic acid One patient, receiving one 10 mg tablet orally three times daily, was cured and discharged from the hospital one month from the beginning of treatment The other two patients were given 20 mg of cevitamic acid orally each day for 4 days, then 40 mg daily for 10 days Disappearance of the typical scorbutic symptoms was prompt in all cases In the latter two cases the cevitamic acid content of the blood serum before and after treatment was determined Before treatment, the serum contained 0.97 mg and 1.02 mg per 100 cc in the two cases In the one case, after 6 days of treatment, the serum cevitamic acid increased to 2.01 mg, and after 14 days it was found to be 1.97 mg The serum content in the second case increased from 1.02 mg up to 2.08 mg per 100 cc after 6 days' treatment the value being 2.06 mg on the 14th day—A F ABT and I M EPSTEIN *J Am Med Assoc*, 104 (1935) 634 (M R T)

Colds—Prescriptions for The author describes the "common cold" giving reasons for infection by the disease and suggestions for methods of protection and treatment Seven prescriptions are given which according to the author are beneficial in the treatment of colds—J W PECK *Chem and Drugg* 122 (1935) 44 (T G W)

Dextrose—Therapeutic Use of Dextrose is readily utilized by all body cells. It can be administered orally, rectally and by injection in large quantities without harm. In child therapy it is used in 5 to 10% solution. For rectal alimentation a 15% solution is used and by this avenue 200 to 300 Gm. of dextrose can be supplied in twenty-four hours. For a single enema, 250 to 350 Gm. of an isotonic, 6% solution can be given. Dextrose is used in the treatment of diseases of the liver, being given simultaneously with insulin. It is also being employed parenterally in place of sodium chloride after operations. For this purpose a 6% solution of dextrose is used. In certain edemas, especially those of cerebral pressure, apoplexy and the like, the intravenous infusion of 50 to 100 cc. of a 50% solution frequently brings about decided improvement. Intravenous injections of dextrose are used successfully in the treatment of acute nephritis, pulmonary edema, myocarditis, varicose veins and muscle rheumatism. Dextropur is recommended for use in place of ordinary dextrose because of its cheapness and purity. Since these dextrose solutions must be sterile, it is recommended that dextropur be dissolved in a 0.08% aqueous solution of Nipagin Nipazol consisting of 65 parts of Nipagin and 65 parts of Nipazol. Nipagin Nipazol has antiseptic but not germicidal action. Although investigations carried out by the author show that only harmless organisms are present in solutions prepared as recommended, in order to conform to the pharmacopoeial requirement, these solutions must be absolutely sterile. Heating in an autoclave at 120° C. would insure absolute sterility, but this degree of heat would decompose many chemicals, therefore, bacterial filtration is recommended as a procedure for obtaining absolutely bacteria-free solutions.—H. ESCHENBRENNER *Pharm. Ztg.*, 80 (1935), 70 (G. E. C.)

Dioxyanthranol 1, 8, a Substitute for Chrysarobin Dioxyanthranol 1, 8 differs in its structural formula from chrysarobin by the lack of the methyl group. With physical and chemical properties similar to chrysarobin, it can replace the latter in practically all pharmaceutical combinations. Concentrations employed range from 0.1 to 5 per cent, but the safe effective range is stated to be between 0.1 to 1.5 per cent. Concentrations above 2 per cent produce a dermatitis. In addition to a review of the literature, the results of the use of dioxyanthranol in the treatment of over 100 cases of dermatoses, notably psoriasis, are presented. Because of the favorable results obtained, both as to effectiveness and freedom from undesirable reactions, the authors conclude that dioxyanthranol 1, 8 is an effective drug and a desirable substitute for chrysarobin in conditions in which chrysarobin has heretofore held the field.—H. BEERMAN, *et al.* *J. Am. Med. Assoc.*, 104 (1935), 26 (M. R. T.)

Estrogenic Preparations—Relief of Menopause Symptoms by A general discussion of effectiveness, dosage, duration of treatment, the relative values of various products, contraindications, etc., as regards available preparations containing one or more of the hormones elaborated by the ovary and the anterior lobe of the pituitary, in relation to their use in the treatment of menopausal symptoms.—E. L. SERVINGHAUS *J. Am. Med. Assoc.*, 104 (1935), 624 (M. R. T.)

Ferric Chloride—Use of, in Poison Oak Dermatitis Tincture of ferric chloride or a solution of 5 per cent ferric chloride in dilute alcohol is stated to be a specific in the prevention and treatment of poisoning from poison oak. For prevention, apply to the exposed parts of the body. For treatment, apply as early as possible. Reference is also made to a treatment by means of a solution of hyposulphite of soda.—*Calif. and Western Med.*, 42 (1935), 39 (B. S. R.)

Fever Sores—Remedies for Fever, or cold sores, are discussed and the following recipes offered. **Colorless Lipstick Types**—(1) White beeswax 31%, cocoa butter 19%, lanolin 5%, menthol 0.5%, thymol 0.1%, camphor 3%, petrolatum, soft, white, short fibre 41.4%. (2) White beeswax 30%, paraffin 2%, petrolatum, soft white 49.8%, cocoa butter 8%, benzocaine 1%, lanolin 5%, camphor 2%, phenol 0.2%, chloroform 2%. Dissolve the benzocaine in the chloroform, melt the other ingredients and add the chloroformic solution. **Ointments**—(1) Tr. benzoin 20%, balsam Peru 10%, cold cream 70%. Heat the cream and stir in the other ingredients until smooth and uniform. (2) Benzocaine 3%, Co. tr. benzoin 20%, balsam Peru 10%, cold cream 61%, chloroform 6%. Dissolve the benzocaine in the chloroform, heat the cream and mix in the other ingredients adding the benzocaine soln. last.—ANON *Drug and Cosmetic Ind.*, 36 (1935), 285, 287 (H. M. B.)

Gonorrhea in Children—Recent Progress in the Treatment of Theelin, intramuscularly

is suggested for the treatment of gonorrhea in children. Subsequent changes (hypertrophy) of the vaginal mucosa renders the mucosa unfit as a habitat for the Neisserian organism. No failures by this method have thus far been reported.—W A N DORLAND *Clin Med Surg*, 42 (1935), 23 (B S R)

Hydrochloric Acid—Use of, in Tonsilitis In acute tonsilitis, intravenous injections of hydrochloric acid act like a specific. Two injections on two succeeding days (no more) of 10 cc of a 1:1500 or 1:1000 solution of the acid are given. Sometimes one injection is enough.—W J HOWELL *Med World* Jan 1935, through *Clin Med Surg*, 42 (1935), 146 (B S R)

Methylene Blue—Intravenous Use of, in the Treatment of Cyanide and Carbon Monoxide Poisoning A new procedure for the treatment of cyanide and carbon monoxide poisoning with methylene blue is given.—J C GEIGER and J P GRAY *Clin Med Surg*, 42 (1935), 96 (B S R)

Nirvanol—Treatment of Chorea with A review of the reported evidence of the value of nirvanol in the peroral treatment of chorea.—L E BENDER and G E PRATT *Med Rec* 141 (Mar 1935), 300 (B S R)

Paraldehyde—Advantages of, as Basic Amnesic Agent in Obstetrics In 100 consecutive cases paraldehyde was used as the basic amnesic agent in synergistic combination with sodium amytal, nitrous oxide and ether being depended upon for analgesia and anesthesia during the latter part of labor and at delivery. Six to 8 drachms of paraldehyde, mixed with an equal volume of olive oil, was administered by rectal tube one half to one hour after the amytal had been given. Because a satisfactory analgesia and amnesia was obtained which apparently did not interfere with physiological labor it was concluded that paraldehyde as a basic amnesic agent in combination with sodium amytal or pentobarbital approaches the ideal in satisfying the fundamental requirements pertaining to labor. The authors state further that there are no contraindications to its use in home confinements.—E D COLVIN and R A BARTHOLOMEW *J Am Med Assoc* 104 (1935), 362 (M R T)

Pertontitis—Prophylactic for Antimotic fluid is recommended for the prevention of peritonitis following severe abdominal operations. References are given.—*Clin Med Surg*, 42 (1935), 29 (B S R)

Phenylmercuric Nitrate—Treatment of Chronic Vaginitis with A report of a case which had resisted all efforts at treatment for 5½ years. An apparently permanent cure was promptly brought about by the use of douches of phenylmercuric nitrate in glycerin 1:1500 diluted down to 1:20,000.—F W HITCHINGS *J Am Med Assoc*, 104 (1935), 212 (M R T)

Psorimangan—Value of, in Psoriasis and Ichthyosis Case reports of the successful treatment of psoriasis and ichthyosis by the injection of Psorimangan, a colloidal form of manganese.—C R PERDUE *Clin Med Surg* 42 (1935), 143 (B S R)

Verodigin—Value of, in Cardiovascular Disease A clinical study of the therapeutic efficiency of Verodigin, the gitalen glucosides of digitalis. References are given.—W T STROUD *et al* *Clin Med Surg*, 42 (1935), 100 (B S R)

Vinethene A review with references of the chemical and experimental investigation of vinethene (vinyl ether). Vinethene is vinyl ether with the addition of 3.5% of absolute alcohol and 0.01% of a nonvolatile oxidation inhibitor. The properties of vinethene are as follows: Clear, colorless liquid, except for a purple fluorescence. Sp Gr of 0.77. B P of 28.3° C, garlic odor, highly inflammable and explosive and heavier than air. It should be preserved in well stoppered containers in a cool place remote from light, fire and acid fumes. Should not be used more than twelve hours after the bottle has been opened. The writer states that vinethene possesses the best characteristics of ethylene chloride and ether without their disadvantages, being extremely rapid in action with quiet induction, not unpleasant to inhale, non irritating to the respiratory passages with a theoretically wide margin of safety, a rapid recovery free from unpleasant after effects, little effect on the respiration and practically no effect on the heart and blood pressure. Complete muscular relaxation has not always been obtained and liver necrosis has been reported in some cases. A brief description is given of the methods of administration with precautions and recommendations.—F E SHIPWAY *Lancet* 1 (1935), 82 (B S R)

NEW REMEDIES

SYNTHETICS

Eunarcon (J D Riedel E de Haen A G, Berlin) is a 10 per cent stabilized aqueous solution of the sodium salt of isopropyl β bromallyl *N* methylmalonylurea suitable for intravenous injection. It is used as a narcotic in simple surgeries and in gynecology similar to ethyl chloride anesthesia, or as a full narcotic in short operations—*Pharm Zentralh*, 76 (1935), 72 (E V S)

Haemodan (Syntetica, Grinsted, Denmark) is an intermediate product in the preparation of adrenalin, and is used as a hemostatic in the 'Stryplinon preparations'—*Pharm Weekblad*, 72 (1935), 226 (E H W)

Rossium Diphenylmethylpyrazalonyl. It is used in cases of abrupt withdrawal of morphine from morphine addicts. The dosage is 0.5 Gm per every 10 lbs body weight per day for five days. It is supplied in bottles of 25, 50 and 100 capsules—*Drug Circ*, 79 (Jan 1935), 31 (T G W)

Zephuirol—New Disinfecting Agent Zephuirol is a high molecular weight alkyl di-methyl benzyl ammonium chloride. It yields a clear yellowish white, slightly alkaline solution which froths strongly on shaking, and which possesses a weak agreeable odor. It kills coli staphylococcus, streptococcus pneumococcus anthrax, typhoid paratyphoid dysentery diphtheria and gonococcus organisms within 2½ minutes in a one per cent solution even in the presence of 10 per cent serum albumin. The Rideal Walker test shows that Zephuirol is 10 times stronger than cresol soap solution. Tests showed that 15 cc bouillon cultures of various germs such as coli streptococcus and anthrax were rendered sterile within two minutes by one drop of a one per cent solution of Zephuirol. It was also shown that the solution can be used successfully in disinfecting hands, rubber gloves and bacterial filtration apparatus. The bacterial filtration apparatus may be kept always sterile and ready for instant use by being stored in a one per cent Zephuirol solution, however, the membranous filters become brittle and unreliable on being kept in the solution twelve hours or longer. To avoid this, the filters should be placed in Zephuirol solution for one hour rinsed with sterile water and then kept in Nipagen Nipazol solution. Sterile solutions of drugs for injection may be prepared by solution of the desired substance in a 0.08 per cent solution of Nipagen-Nipazol and subsequent filtration through apparatus made and kept sterile as described—H ESCHENBRENNER *Pharm Ztg*, 80 (1935), 94 (G E C)

SPECIALTIES

A-B-D Capsules (Abbott Laboratories North Chicago Ill.) Capsules containing the equivalent of at least three teaspoonsful of cod liver oil in vitamins A and D, two cakes of moist compressed yeast in vitamin B₁ content and one-half cake of moist compressed yeast vitamin B₂ (G) content. They are used for the treatment of disorders due to a lack of vitamins A, B₁, B₂ (G) and D. They are supplied in boxes of 25 and 100 capsules—*Drug Circ*, 79 (Mar 1935) 33 (T G W)

Acetcarbromal (Syntetica, Grinsted, Denmark) is acetylcarbromal, which is also found on the market under the trade name of "Abasine"—*Pharm Weekblad*, 72 (1935), 225 (E H W)

Aconite-dispert (Dispert Ltd The Hague) is an aconite extract prepared by the dispert-method of Krause. In the dispert-method the liquid extract obtained from the plant parts is finely subdivided. So finely, in fact that one liter is sprayed over a surface 300 M square. It dries during the spraying, the speed of the droplets of mist being 140 M per second. Aconite-dispert so obtained from aconite root is made up into tablets of two strengths, standardized as equivalent to 0.05 mg of aconite per tablet and 0.2 mg of aconite per tablet. The tablets contain besides aconitine the other alkaloids and therapeutic constituents of aconite and are employed in neuralgia, migraine etc—*Pharm Weekblad*, 72 (1935), 70 (E H W)

Aderol (Kynazon-Werk, Frankfurt a M.) is an external alcoholic preparation containing d-bornyl acetate (1 per cent), an isothiocyanic acid ester (0.5 per cent), camphor (5 per cent) and ethereal oil (17 per cent). It is used in the treatment of whooping cough, bronchitis and pneumonias of infants and older children—*Pharm Zentralh* 76 (1935), 104 (E V S)

Adiposettes are coated tablets supplied in packages of 250 by Rudolf Reiss, Berlin, Germany. They are used as fat reducing agents and consist of *Fucus vesiculosus*, frangula, lecithin dihydroxyphthalophenon ester and tritetraborylbistrioxypopyl ester — *Pharm Ztg*, 80 (1935) 109 (G E C)

Adormine-tablets (Apogepha, Dresden) contain 0.5 Gm of bromdiethylacetylcarbamide — *Pharm Weekblad*, 72 (1935) 70 (E H W)

Agrypnal Ampuls (Medica, Prague) of 20 or 30 per cent phenylethylbarbituric acid, acetamide, propionamide, betaine and distilled water are prepared by Eggochemia, Vienna — *Drug and Cosmetic Ind*, 36 (1935), 93 (H M B)

Albicol is composed of purified colloidal aluminum silicate, betanaphthol benzoate, bismuth subsalicylate and aromatics. It is indicated in cases of gastric ulcer, gastric hyperacidity and ulcerative colitis. It is supplied in 3-ounce canisters — *Drug Circ* 79 (Feb 1935) 27 (T G W)

Aletemilch (Alete Pharm Producte G m b H, Munich) is dried whole milk previously acidified with lemon juice. It is used as a nourishment for infants and small children — *Pharm Zentralh*, 76 (1935) 104 (E V S)

Allpropan-tablets (Apogepha, Dresden) contain 0.16 Gm of diallyldipropylbarbituric acid with bromdiethylacetamide — *Pharm Weekblad* 72 (1935) 70 (E H W)

Alloton (J D Riedel E de Haen A G, Berlin) is a chemical combination of garlic oil (12 per cent) and dioxycholic acid, in addition each coated pill contains the active constituents of 1 Gm of fresh garlic. Its use is indicated in digestive disorders, worms, climacteric changes and arteriosclerosis — *Pharm Zentralh*, 76 (1935), 71 (E V S)

Allylpropynal ('Syntetic,' Grindstedvaerket, Denmark) is allylisopropylbarbituric acid. This is employed in preparing 'Givofen' and 'Givonal' (see below). It is likewise a constituent of Allonal — *Pharm Weekblad* 72 (1935), 177 (E H W)

Aluminum-acetate-dispert (Dispert Ltd, The Hague) is aluminum acetate in powdered form prepared by the dispert method, which retains its solubility and may be employed for the preparation of aluminum acetate solutions. It is supplied in 5 Gm packages or may be obtained in bulk — *Pharm Weekblad*, 72 (1935) 70 (E H W)

Androstina (Ciba) is a biologically titrated extract from testes. It is marketed in ampuls, six to the box, of which three contain water as the solvent and three contain fat as the solvent for the extract. The latter must be heated to body temperature before using. Androstina tablets are red in color, each containing the active constituent of 8 Gm of fresh testes — *Pharm Weekblad*, 72 (1935), 225 (E H W)

Anginal Tablets (Medica, Prague) contain pyrocyanic-protein sec, menthol and oil of thyme. They are marketed in packages of 20 tablets — *Drug and Cosmetic Ind*, 36 (1935), 93 (H M B)

Aplona (Dispert Ltd, The Hague) is a light brown powder which clots easily. It is prepared from fresh apples without the addition of other material by the dispert method of Krause. It is used in the apple diet for diarrhoea — *Pharm Weekblad*, 72 (1935) 70 (E H W)

Arsenetten (Zima) are tablets containing arsenious acid, yeast extract and yeast vitamins. The tablets weigh 0.2 Gm and contain 0.001 Gm of arsenious acid. Dose, 1-3 tablets per day — *Pharm Weekblad* 72 (1935), 178 (E H W)

Belladonna-dispert (Dispert Ltd, The Hague) is prepared by the dispert method of Krause. It is a belladonna extract free from inert substances and containing only the active constituents of Belladonna, particularly 1 hyoscyamine. Belladonna dispert is given in powdered form in doses of 10-30 mg and is biologically standardized to an atropine content of 1.5%. Belladonna dispert-liquidum is a clear liquid of which the dose is 10-15 drops. Belladonna dispert tablets of which one tablet contains 0.25 mg of atropine, are used in doses of 1-2 tablets. The suppositories contain 0.3 mg of atropine per suppository — *Pharm Weekblad*, 72 (1935), 70 (E H W)

Bellergal (Sandoz Chemical Factory) contain 0.0001 Gm bellafoline 0.0003 Gm gynergen and 0.02 Gm phenylethylbarbituric acid. They are used in vasoneurosis, Grave's disease, migraine, menstrual disturbances, etc. Dose 4-6 tablets per day — *Pharm Weekblad*, 72 (1935) 225 (E H W)

Bio-Talc (Dr Boucard, Paris) is a talcum powder containing milk ferments — *Pharm Weekblad* 72 (1935) 71 (E H W)

Blimal (Laboratoires de Pharmacologie médicale, Paris) is a solution of hexamethylenediamine iodomethylate, dimethylenediamine salicylate and papaverine hydrochloride offered in ampuls for the treatment of rheumatic affections—*Pharm Weekblad*, 72 (1935), 71 (E H W)

Brocanal (Curta and Co, G m b H, Berlin-Butz) are tablets containing, in each, 0.025 Gm of phenylethylbarbituric acid, 0.4 Gm of bromcalcium diethanolamine (equivalent to 0.15 Gm of bromine and 0.037 Gm of calcium) and 0.015 Gm of caffeine. They are indicated in genuine and traumatic epilepsy, mental disturbances of convalescence, depression and climacteric disturbances—*Pharm Zentralh*, 76 (1935), 71 (E V S)

Calcitrine Calcitrine is indicated in coughs due to colds, tracheitis and acute inflammation of the respiratory tract. Each fluidounce represents calcium iodide, 7 grs (equivalent to iodine, 6 grs), ephedrine hydrochloride, $\frac{3}{8}$ gr, nembutal, $\frac{3}{8}$ gr, syrup wild cherry, tolu, aromatics, q s. It is supplied in pint and gallon bottles—*Drug Circ*, 79 (Feb 1935), 26 (T G W)

Calciphos A slightly grayish white powder containing about 19% calcium, 15% phosphorus and 2% iron as salts of inositol hexaphosphate, occurring naturally in Indian corn. It is used for calcium medication in diseases and conditions resulting from a mineral deficiency, such as malnutrition, rickets, dental caries, during pregnancy and lactation, and in allergic conditions. It is packaged as powder in 3 ounce boxes and as 6 gr tablets—*Drug Circ*, 79 (Jan 1935), 30 (T G W)

Calmuran (Dr Hans Truttwin, Dresden) is an ointment containing brominated uranium oxide (9% uranium, 7% bromine). The ointment has the consistency of Unguentum Leniens and is employed to relieve itching—*Pharm Weekblad*, 72 (1935), 225 (E H W)

Camuirol is composed of iodoform, iodides, menthol, camphor and oil of sweet almonds. Intramuscularly it has been found very beneficial in the treatment of the early stages of pulmonary tuberculosis, tuberculosis of the bone, sinus infections, influenza, pneumonia and the common bronchial affections—*A E OLPP Med Rec*, 141 (Feb 1935), 157 (B S R)

Cantan (Bayer, I G Farbenindustrie A G, Leverkusen a Rh) is a tablet containing 0.025 Gm of l ascorbic acid the C vitamin Bayer. It is indicated in scurvy and all the early stages of pronounced hypovitamin conditions, in hemophilia and to assist in the treatment of infectious diseases—*Pharm Zentralh*, 76 (1935) 72 (E V S)

Cebione (Merck & Co, Rahway, N J) Cebione is cevitic acid, a pure vitamin C, which was formerly called ascorbic acid. A white or slightly yellowish white odorless crystalline powder, used in the treatment of diseases where there is a deficiency of vitamin C. It is supplied in tubes of 10 and 100, 0.01-Gm and 0.05 Gm tablets for oral use and in ampuls containing 0.1 Gm—*Drug Circ*, 79 (Mar 1935), 32 (T G W)

Citopogeen (Royal Pharm Factory Brocades & Stheeman and Pharmica, Netherlands) is a disinfectant especially designed for veterinary purposes. It serves for the extermination of vermin, for the sterilization of instruments and as an irrigating liquid (1-3%). It is not poisonous, only slightly stimulant and according to the researches of Prof de Bleeck is more powerful than lysol, lysoform, carbol and therapogen—*Pharm Weekblad*, 72 (1935), 225 (E H W)

Codent Tablets (Sanabo chinoin G m b H, Vienna) contain 0.02 Gm codeine hydrochloride, 0.02 Gm Ephert (chloride of synthetic racemic ephedrine), 0.0005 Gm total alkaloids of ipecac. They are marketed in packages of 10 tablets—*Drug and Cosmetic Ind*, 36 (1935), 93 (H M B)

Colchicum-dispert (Dispert Ltd, The Hague) is an extract obtained from colchicum seeds by the dispert-method, the colchicine content being standardized. The extract is also standardized biologically. It is put up in capsules, the dose in chronic cases being 1-3 per day, and in acute rheumatic attacks, one capsule 6-7 times per day—*Pharm Weekblad*, 72 (1935), 71 (E H W)

Collumol (Dr Blajet's Chemical Factory) is a colloidal peptic aluminum hydroxide. It is employed in various stomach affections and as an antidyseptic in hyperacidity, in abnormal fermentation, etc. Collumol, under the influence of the acid of the gastric juice, settles as a gelatinous film on the stomach walls. It is found on the market in powdered form—*Pharm Weekblad*, 72 (1935), 225 (E H W)

Comallysatum (Bürger, Zima) is a product obtained from *Allium ursinum* by dialysis. It occurs on the market in liquid form and in ampuls. It contains the same therapeutically active

constituents as the wild growing *Alium ursinum* which has bactericidal properties, and is recommended in intestinal dyspepsia, loss of appetite and amoebic dysentery Dose, $\frac{1}{2}$ teaspoonful 2-3 times a day or two ampuls 3-4 times a day —*Pharm Weekblad*, 72 (1935), 178 (E H W)

Corcumen (Temmler Works Berlin) is distributed in capsules and ampuls The capsules contain 0.1 Gm of curcumine sodium and 0.1 Gm calcium chlorate The ampuls contain 5.5 cc of a 5% solution of curcumine sodium They are employed in liver and gall bladder diseases —*Pharm Weekblad*, 72 (1935), 71 (E H W)

Corvis (M J Lewenstein Amsterdam) is pentamethylenetetrazol, $C_6H_{10}N_4$, which is the same compound found on the market under the names of Cardiazol and of Pentazol It is also employed as a powerful analeptic for the heart and respiratory center Administration per os results in an action of greater duration than subcutaneous, intramuscular or intravenous injection It comes on the market as a powder, in solution in tablets of 0.1 Gm and in ampuls of 0.1 Gm per cc —*Pharm Weekblad* 72 (1935) 225 (E H W)

Cynhepatil (Lab Benderitter) has the following composition Extract of artichoke leaves 100 mg stabilized liver powder, 100 mg, purified meat peptone, 100 mg, talc, acacia, corn starch, gluten, gum lac, black glycine Klotz, naphthol yellow Blayn in tablet form Marketed in bottles of 60 tablets —*Drug and Cosmetic Ind* 36 (1935) 93 (H M B)

Cystoblettes This preparation manufactured by H L Ritter and Co Berlin Germany contains 40 dragees to the package It consists of Extract of Buchu, Salol, Benzoic Acid, Extract of Uva Ursi, Hexamethylenetetramine and Monobromated Camphor It is recommended by the manufacturer for acute and chronic gonorrhea and their complications simple urethritis, cystitis, pyelitis and pyelonephritis —*Pharm Ztg*, 80 (1935), 72 (G E C)

Danamine ('Syntetic,' Grindstedvaerket Denmark) is 3-pyridine carbonic acid diethyl amide, a crystalline material melting at 26-28° and easily soluble in water It is identical with

Coramine' and is likewise used as a cardiac tonic It replaces camphor for injection and is used in carbon monoxide poisoning It is employed in 25% solution with the addition of a little acid for injection —*Pharm Weekblad*, 72 (1935), 178 (E H W)

Danarsine ('Syntetic,' Grindstedvaerket Denmark) is the calcium salt of allylarsenous acid $C_3H_5AsO_3Ca \cdot H_2O$ It agrees in composition with Arsyleen'' Its content of water free salt is 90.4% Danarsine is a whitish powder with a light yellow tint The name may easily be confused with Danamine (from the same factory) especially in prescriptions which are not legibly written —*Pharm Weekblad* 72 (1935) 178 (E H W)

Daucaysatum (Burger Zyma) is a dialytic prepared from *Daucus Carota*, the volatile oils of which possess antihelmintic properties especially for thread worms and round worms —*Pharm Weekblad*, 72 (1935), 178 (E H W)

Deriphyllin Ampuls (Chemisch Pharmazeutische Aktiengesellschaft Bad Homburg Germany) This preparation is used for the intravenous and intramuscular injection of theophylline oxyamine Each cc of solution corresponds to 0.412 Gm of deriphyllin It is supplied in boxes of 6, 25 and 100 ampuls —*Pharm Ztg* 80 (1935) 109 (G E C)

Deriphyllin Suppositories (Chemisch-Pharmazeutische Aktiengesellschaft Bad Homburg Germany) Each suppository contains 0.618 Gm of deriphyllin 1 to 4 suppositories may be taken daily The preparation is especially useful in angina and cardiac dyspnea It is supplied in packages of 6, 25 and 100 —*Pharm Ztg* 80 (1935) 109 (G E C)

Dermarodyl (Dr Hugo Rosenberg, Freiburg) has as its active constituent a sulphocyanide derivative of acetyltrimethylcolamine dissolved in a water free solvent which is readily absorbed through the skin It combines the blood pressure lowering properties of acetylcholine with those of the sulphocyanide Action follows rather rapidly upon absorption through the skin —*Pharm Weekblad*, 72 (1935), 225 (E H W)

Diacedan is prepared in a Danish factory This name is given to diacetyldioxyphenylisatin which is also found on the market under the name of 'Isaceen' and which is official in the Danish pharmacopœia as "Acetphenolisatinum" —*Pharm Weekblad* 72 (1935), 226 (E H W)

Digitalis-dispert (Dispert Ltd The Hague) is obtained by the dispert method of Krause and biologically assayed by the Houghton-Straub method It is a cold water extract of digitalis leaf prepared in the customary way, sprayed and dried It occurs on the market in powdered form in tablets of 150 F D (frog units), as Digitalis dispert-liquidum of which 1 cc is equivalent to 200 F D and in suppositories of 300 F D —*Pharm Weekblad* 72 (1935) 71 (E H W)

Distol (Chinoinfabrick at Budapest) is a medicament used for distomatose in cattle According to Gehe's Codex it contains the active constituents of male fern and is marketed in capsules—*Pharm Weekblad*, 72 (1935) 226 (E H W)

Diuretysatum (Burger, Zyma) is a dialysate prepared from squill, juniper berries and birch leaves It stimulates kidney function and promotes diuresis In addition it possesses the properties of a cardiac tonic Dose one teaspoonful three times daily—*Pharm Weekblad*, 72 (1935) 178 (E H W)

Dormalets (Dr R Weiss, Berlin) are tablets containing 0.32 Gm of calcium lactobromide, 0.05 Gm pyramidon and 0.03 Gm sodium phenylethylbarbiturate They are employed in insomnia—*Pharm Weekblad*, 72 (1935), 71 (E H W)

Endomin (Reed and Carnrick, Jersey City, N J) is the name of a tablet containing iron, 80 mg, copper, 0.6 mg, manganese 0.4 mg, zinc, 0.3 mg, nickel, 0.03 mg, cobalt, 0.03 mg, and sodium germanate, 0.05 mg, in lipid soluble form Endomin is indicated in the treatment of anemias It is supplied in bottles of 100, 500 and 1000 tablets—*Drug Circ*, 79 (Mar 1935), 32 (T G W)

Endothyryn is a product recommended for conditions due to hypothyroidism, obesity dermatoses and ovarian dystrophies It is supplied in bottles of fifty $\frac{1}{2}$ gr tablets and boxes of five 1 cc ampuls The composition of the product is thyroid, U S P triple strength, gr $\frac{1}{2}$, lactose and starch, q s ad gr 4 It is contraindicated in hyperthyroidism, cardiac instability and extreme nervousness—*Drug Circ*, 79 (Jan 1935), 31 (T H W)

Endothyryn (Endocrines, Ltd, London) is a standardized thyroid containing double the prescribed quantity of iodine and is used in hypothyroidism, myxedema, etc It is marketed in bottles of 50 or 100 $\frac{1}{2}$ grain tablets—*Drug and Cosmetic Ind*, 36 (1935), 93 (H M B)

Ephepurine (Amsterdam Quinine Works) is a combination of acetylsalicylic acid and ephedrine appearing on the market in tablets of 0.5 Gm The proportion is not stated—*Pharm Weekblad*, 72 (1935), 71 (E H W)

Epitheel-Dragees (Burger) are prepared from Glandula Parathyreoidea Siccata Each tablet contains 8 mg of the dried powder They are recommended to maintain a normal calcium balance They are used to raise the calcium content in persons with calcium deficiency, by oral administration Dose, one tablet three times daily—*Pharm Weekblad*, 72 (1935), 178 (E H W)

Eusod (H Schering-Kahlbaum A G, Berlin) is a heartburn remedy containing a synthetic aluminum sodium silicate and pure magnesium oxide in which the action of the silicate component is gradually liberated but hastened by the magnesium—*Pharm Zentralh*, 76 (1935), 105 (E V S)

Feosol S-K-F (Smith, Kline and French Laboratories, Philadelphia Pa) Tablets containing 3 grains of exsiccated ferrous sulphate, U S P with a special vehicle and coating to prevent oxidation and promote disintegration They are indicated in the treatment of secondary anemia, idiopathic hypochromic anemia, chlorosis, hypochromic anemia of pregnancy, the anemia following menorrhagia, and in other microcytic anemias accompanied by a low color index They are supplied in packages of 100, 1000 and 5000 tablets—*Drug Circ*, 79 (Mar 1935) 33 (T G W)

Frangula-dispert (Dispert Ltd The Hague) is an extract prepared by the dispert-method from Frangula bark and made into tablets, each with a content of 25 mg of emodin Dose, 1-3 tablets—*Pharm Weekblad*, 72 (1935) 72 (E H W)

Givofen ("Syntetic," Grindstedvaerket, Denmark) is a solution containing 100 Gm allyl propynal and 100 Gm diethylbarbituric acid in 100 cc—*Pharm Weekblad* 72 (1935) 178 (E H W)

Givonal ("Syntetic," Grindstedvaerket Denmark) is a mixture of 100 parts of amidopyrine and 60 parts of allylpropynal (allylisopropylbarbituric acid) It comes on the market as tablets, each containing 0.1 Gm of amidopyrine and 0.06 Gm of allylpropynal—*Pharm Weekblad* 72 (1935) 178 (E H W)

Gynergeen, ergotamine tartrate, is a tartrate of the alkaloid obtained from ergot by the Stoll method It has recently been employed not only in obstetrics but also in the treatment of Graves' disease—*Pharm Weekblad*, 72 (1935) 72 (E H W)

Horosteon (Dispert Ltd, The Hague) is an extract of bone marrow prepared by the method of Dr W Hoffmeister. It is obtainable in ampuls containing 1 cc of the colorless liquid, which serves to hasten delayed calcification in bone breaks — *Pharm Weekblad* 72 (1935), 72

(E H W)

Iod-Tetragnost-Powder (E Merck, Darmstadt) is the sodium derivative of tetraiodo phenolphthalein — *Drug and Cosmetic Ind*, 36 (1935), 93

(H M B)

Kessoval (Schering-Kahlbaum) is a preparation made from valerian root by a new method. According to the manufacturer it contains all the active constituents of the root. It comes on the market in the form of capsules — *Pharm Weekblad* 72 (1935), 226

(E H W)

Laxatives A general discussion introducing new products — ANON *Drug and Cosmetic Ind*, 36 (1935), 31, 34

(H M B)

Leukichthol A light ichthyol preparation (Leukichthol) with a total sulphur content superior to that of ichthyol, i.e., 12–13% as compared with 10–11%, is described. Not only has the preparation increased reducing power but a 2–5% concentration acts as effectively as a 10–20% preparation of ichthyol. Smaller doses are sufficient when intended for the face and other delicate skin surfaces, e.g., scrotum. Since this preparation is completely colorless it is very useful for cosmetic ointments, pastes, rinses and varnishes. For the same reason, this salve may be applied for day use on the uncovered parts of the body, face and hands. A very active and practically unnoticeable preparation is made with gelanthus using 2% of the ointment. Up to date Unna has treated 67 cases of dermatoses with good results in dermatitis, urticarial and congestive dermatoses, keratoid eczema, and especially allergic dermatoses due to light, leather and fur — P. UNNA, JR *Dermatol Wochschr*, 100 (1935), 54, through *Squibb Abstract Bull*, 8 (1935), A 329

Lidrosan (Laboratory of Lansbery & Son, Rotterdam) is a liquid extract of *Drosera rotundifolia*, *Thymus vulgaris* and *Pinguicula vulgaris* and is used in the treatment of whooping cough. Dose, 3–15 drops three times a day — *Pharm Weekblad*, 72 (1935), 72

(E H W)

Mebaral N-Methylethylphenylmalonylurea. A white, odorless and tasteless powder used as a sedative and antiepileptic. It is supplied in bottles of 25 and 100, 3-gr tablets and bottles of 100, 1/2 gr tablets — *Drug Circ*, 79 (Feb 1935), 27

(T G W)

Mistol (Deutsche Gesellschaft für Pharmazie u Kosmetick m b H, Berlin) is an alcoholic inhalant containing camphor (12.4 per cent), menthol ester (16.8 per cent) and oil of eucalyptus (15.5 per cent) which is used as an inhalant for colds and catarrh — *Pharm Zentralh*, 76 (1935), 72

(E V S)

Moru-Quin A solution of the sodium salts of the fatty acids of cod liver oil, containing 5% of sodium morrhuate, 2% of alkaloidal quinine, and 2% of benzyl alcohol. The preparation is injected for the treatment of varicose veins. It is supplied in 5-cc and 25-cc ampuls — *Drug Circ* 79 (Jan 1935), 30

(T G W)

Naftalan is claimed to be a mild non irritating crude naphthal found in the Caucasus, and to show an inhibiting effect on inflammations of various types, rapid resorption and in general therapeutic properties intermediate between those of ichthyol and tar. It is indicated in dermatoses such as rosacea, pruritus, etc., and all forms and degrees of eczema. It may be combined with a suitable base and used in ointment or suppository form — W. CASPER *Dermatol Wochschr*, 99 (1934), 1615, through *Squibb Abstract Bull*, 8 (1935) A-301

(S W G)

Neo-Oleosal (I G Farben) is a painless injectable bismuth preparation. It is a 10% solution of dimethylendimethylene hexahydrobenzoic acid bismuth in olive oil. The salt contains 30% bismuth, the oil 3%. The bismuth may be determined by dissolving in benzene acidifying with hydrochloric acid and shaking out with dilute hydrochloric acid. Neo Oleosal is sold in ampuls of 2 cc exclusively for intramuscular injection. Dose (adults) one injection 2–3 times per week — *Pharm Weekblad* 72 (1935) 226

(E H W)

Neo-Psicobenyl (Drs R & O Weil, Frankfurt) is a psicaine anaesthetic paraffin emulsion used in throat and mouth affections — *Pharm Weekblad* 72 (1935) 72

(E H W)

Nitrodan ("Syntetic," Grindstedvaerket Denmark) is α dinitrophenol, a weight reducing drug which has recently appeared on the market under many fantastic names. Dose, 0.05 Gm. It is a light yellow powder melting at 111–112°, and may be titrated with bromthymol blue as an indicator — *Pharm Weekblad* 72 (1935), 179

(E H W)

Pancreas-dispert (Dispert Ltd The Hague) is prepared by the method of Krause from the pancreas of healthy slaughter house animals. It is also available in the form of an ointment

(Unguentum Pancreas dispersum) or "Pyosalva" and a plaster (Emplastrum Pancreas dispersum). Internally it is used as an aid to digestion. It is found on the market in tablets having a lipase value of 0.25 and as a powder having a lipase value of 0.35 — *Pharm Weekblad*, 72 (1935), 72 (E H W)

Pentazol ("Syntetic," Grindstedvaerket, Denmark) is pentamethylenetetrazol, a compound resembling cardiazol, of which the identity and purity may be determined as provided in the Supplement of the 5th edition of the Dutch Pharmacopœia — *Pharm Weekblad*, 72 (1935), 179 (E H W)

Pertussine-drops (E. Taeschner, Potsdam) contain a percolate of *Thymus vulgaris*, *Drosera rotundifolia* and other saponin and silicic acid containing plant parts with the addition of ephedrine hydrochloride — *Pharm Weekblad*, 72 (1935), 72 (E H W)

Phenylal (Apogepha, Dresden) is phenylallylbarbituric acid — *Pharm Weekblad*, 72 (1935), 72 (E H W)

Philonin (Chem. Fabric Promonta G. m. b. H., Hamburg) are suppositories containing copper iodo-oxyquinoline sulphate, silver nitrate and irradiated cholesterol with local anesthetics. They are indicated for use in hemorrhoids, anal fissures, perianal eczema and other anal diseases — *Pharm Zentralh.*, 76 (1935), 72 (E V S)

Photodyn (Nordmarkwerke, G. m. b. H., Hamburg) consists of a 0.2 per cent solution of hematoporphyrin in ampuls of various sizes. The "drops" consist of 0.05 per cent hematoporphyrin in hydrochloric acid solution — *Drug and Cosmetic Ind.*, 36 (1935), 93 (H M B)

Pneumostagnine (Dr. G. Henning) is a sterile solution of quinine and camphor in ethyl chaulmoograte used in pneumonia, bronchitis, etc — *Pharm Weekblad*, 72 (1935), 72 (E H W)

Ponine (Laboratoires de pharmacologie médicale, Paris) is a weight-reducing remedy distributed as cachets and granules. The composition unknown — *Pharm Weekblad*, 72 (1935), 72 (E H W)

Procythol forte Ampuls (Sanabo Chinoim G. m. b. H., Vienna) consist of liver extract for injection, each ampul is equivalent to 5 Kg. fresh liver. Packages of 5 ampuls from 2-20 cc — *Drug and Cosmetic Ind.*, 36 (1935), 93 (H M B)

Psorimangan "Weil" is an aqueous colloidal suspension of manganese dioxide, used in the treatment of psoriasis and furunculosis. It is supplied in 1- and 2-cc ampuls for intramuscular injections and 1- and 2-cc ampuls for intravenous injections — *Drug Circ.*, 79 (Jan 1935), 30 (T G W)

Pyosalva (Dispert Ltd., The Hague) is an ointment consisting of pancreatin (2%) in vaseline. The addition of this ferment to vaseline serves to hasten the disappearance of suppurating wounds and inflamed tissue thus often making incisions unnecessary — *Pharm Weekblad*, 72 (1935), 73 (E H W)

Quinine-Calcium-Sandoz (Sandoz Chemical Factory, Basel) is a combination containing in 10 cc of the solution, 0.6 Gm. quinine gluconate (corresponding to 0.37 Gm. of quinine base) and a 10% solution of Sandoz-calcium solution. It is found on the market in ampuls of 10, 5 and 2 cc. This medicament possesses the antixudative properties of calcium with its tonic effect upon heart and blood vessels combined with the anti-infective, antipyretic and sedative properties of the quinine. It is employed in croup, pneumonia, grippe, angina, etc — *Pharm Weekblad*, 72 (1935), 73 (E H W)

Rectidon is the sodium salt of secondary amyl- β -bromallylmalonylureide. It is marketed as a stabilized 10% aqueous solution and in suppositories. The formula is $C_{12}H_{16}O_2N_2BrNa$. It is used in surgery and gynecology in supporting inhalation narcosis at the start and also as a local and spinal anæsthetic. The dose of Rectidon is 8 cc. for men, 7 cc. for women and for ten-year-old children 4 cc. diminishing to 1 cc. for children of one year. Rectidon is employed in doses of 6-7 cc., 2-3 times daily in the treatment of the morphine habit by sleep of extended duration. Pharmacologically it is a homolog of "pernocton". The patient falls asleep within 15 minutes after (rectal) injection. Rectidon is found on the market in boxes containing one ampul of 10 cc., in 100-cc. bottles, in boxes of 3 suppositories of 0.4 Gm. and in boxes of 50 suppositories — *Pharm Weekblad*, 72 (1925), 226 (E H W)

Risulform (Dr. L. Kaufmann, Berlin-Wilmersdorf) is a preparation containing sulphoform, an organic sulphur antimony compound 5 Gm., cholesterol 2 Gm., castor oil 50 Gm. and

ethanol 50 Gm It is used in the care of the hair especially against alopecia seborrhoica —*Pharm Zentralh*, 76 (1935), 72 (E V S)

Secale-dispert (Dispert Ltd, The Hague) is an extract of ergot prepared by the method of Krause It is marketed in the form of suppositories standardized to contain 1 mg of alkaloids each Since the Secale dispert is readily absorbed in the rectum the suppositories may be used in place of injections in abortion to promote discharge from the womb in menorrhagia, etc —*Pharm Weekblad*, 72 (1935), 73 (E H W)

Securodorm (Dr E Silten, Berlin) is a combination of butylæthylbarbituric acid ('securonal') with 'cyloralose' It is a hypnotic the dose being 1-2 tablets —*Pharm Weekblad*, 72 (1935) 73 (E H W)

Softol (Laboratoire de Pharmacologie medicale, Paris) is an organic mercury arsenic compound, the methylodide of mercuric nucleo arsenic-salicylate It is used as an intravenous injection once a week for spirochete infections —*Pharm Weekblad*, 72 (1935), 73 (E H W)

Solucamphor Debalande Ampuls (M Debalande Courbevoine-Seine) contain 0.14 Gm diethylenediaminocamphor sulphonate per cc in 1, 2, 5 cc ampuls —*Drug and Cosmetic Ind* 36 (1935), 93 (H M B)

Soxolade (Nahrmittelfabrik Munchen G m b H Berlin Charlottenburg) is a dietetic nutrient food containing 30 per cent of fat-free cocoa powder maltose amylose plant albumins egg lecithin phosphorus, iron and calcium It is used as a nerve food for the young or old, especially for pregnant and nursing women, nervousness and anemias —*Pharm Zentralh*, 76 (1935), 72 (E V S)

Specialties—Review of German, for 1934 A discussion of new German specialties which the author divides into groups according to their pharmacologic activity or use The classification includes vitamins, hormones, ointments, antiseptics, soporifics and hypnotics, and treatment of cancer The possibilities of heavy water are enumerated Some advances in pharmaceutical apparatus during the past year are described and illustrated —K SCHULZE *Scientia Pharm*, 6 (1935), 1 (M F W D)

Stannoblettes (H L Ritter and Co, Berlin Germany) These tablets are stated by the manufacturer to contain as the active ingredient chemically pure, lead-free tin oxide They are recommended for use in the treatment of furunculosis, as well as all staphylococcus infections carbuncles, acne vulgaris acne rosacea eczema, pyoderma, sycosis hordeolum abscesses of all kinds and lymphangitis They are distributed in packages of 35 and 80 tablets —*Pharm Ztg*, 80 (1935), 72 (G E C)

Stomachetten (Zyma) is composed of vitamin-yeast extract and vitamin yeast powder both of which by virtue of their content of amino acids and purine compounds stimulate the flow of gastric juice In case of loss of appetite 3-4 tablets are taken 1/ hour before meal time —*Pharm Weekblad*, 72 (1935) 179 (E H W)

Thymodronal (Orgapharm Ltd Amsterdam) is a syrup made from Extract *Primulae Violae odoratae*, *Pimpinella Drosera*, *Castanea vesca*, *Plantaginis Thymi*, *Liquiritiae* 7.5 Gm, Extract *Aconiti Belladonnae*, *Bryoniae Hyoscyami*, *Ipecacuanhae* 0.25 Gm *Sulphoguaiacolas kalicus* 4.5 Gm, Simple syrup and 150 Gm and flavoring oils It is an expectorant which is given in doses of a half tablespoonful for adults and a half to one teaspoonful for children It also appears on the market with 0.1% codeine —*Pharm Weekblad*, 72 (1935) 73 (E H W)

Thyroid-dispert (Dispert Ltd The Hague) is obtained by the method of Krause and consists of the dry powder of the thyroid gland standardized in thyroid units by the method of Straub on white mice It appears on the market in tablets of 5 and 10 units —*Pharm Weekblad*, 72 (1935) 73 (E H W)

Valeriana-dispert (Dispert Ltd The Hague) is prepared by the method of Krause from valerian root and physiologically standardized on mice by the method of Haffner It occurs on the market in capsules the dose being 1-3 as necessary —*Pharm Weekblad*, 72 (1935) 73 (E H W)

Vaxa (Dr Boucard Paris) is a bullion vaccine used as an internal medicament Because of the unpleasant odor of this preparation, it is advised to aromatise the contents of the ampul which must be well shaken before taking In the preparation of Vaxa a number of different organisms are used *B. coli*, *Streptococcus fecalis*, *Staphylococcus aureus*, *Streptococcus proteus* etc It is said to contain the exotoxins and endotoxins Vaxa immunizes the peritonium and is used

in *Coli* bacilliosis, cystitis and other infections. A spoonful of olive oil is taken in the morning. This is followed twenty minutes later by an ampul of milk ferments and 10 minutes later by an ampul of *vava*. One half hour should elapse before breakfast is begun.—*Pharm Weekblad*, 72 (1935), 74 (E H W)

Viatol (Dr Boucard, Paris) is a vitamin preparation (mostly vitamin B) in tablet form, used as a strength reinforcing medicament for children and as a nutrient for adults. Dose, 1-2 tablets.—*Pharm Weekblad*, 72 (1935), 74 (E H W)

Viscophyll (Gehe and Co., Dresden) is a specially processed extract drop solution prepared from the choline ester of fresh mistletoe, chlorophyll and *Fucus vesiculosus*, used against hypertonic and sclerotic vessel variations and conditional maladies of the aged.—*Pharm Zentralh*, 76 (1935), 73 (E V S)

Zittmangan (Bürger) is prepared by Zyma from sarsaparilla root with the addition of manganese and sulphur. It serves as an adjuvant in arsenic-, bismuth-, mercury therapy. Dose, 2-3 tablets three times a day.—*Pharm Weekblad*, 72 (1935), 179 (E H W)

BACTERIOLOGY

Antiparalysis Serum—One Hundred Per Cent Effectiveness with. During an infantile paralysis epidemic seven hundred persons were injected with antiparalysis serum and not one developed the disease. This serum was developed by Maurice Brodie and is made through infection of a rare type of Indian monkey with virus taken from the nasal passages. The infected monkey's spinal cord is then excised and the emulsion made of it is sterilized with formalin, which makes the vaccine harmless.—*Med Rec*, 141 (Feb 1935), 212 (B S R)

Antipoliomyelitis Serum—Virus Adsorbed to Alumina-Gel for Production of, in Sheep Ether treated virus was shaken with alumina-gel (Willstaetter, Type C) at a pH 6.5. Two injections of 50 and 65 cc produced antiserum of a titer beyond 1:500.—F B GORDON, J A HARRISON and N P HUDSON. *Proc Soc Exptl Biol Med*, 32 (1935), 689 (A E M)

Antitoxic Serum—New Method of Treatment of Diphtheria with. The author attributes the high mortality in diphtheria to be due to the unsystematic use of insufficient doses of serum. He injects the serum daily without omission until all symptoms, including general symptoms, completely disappear. The method is given in detail.—A T JAROTZKY. *Med Rec*, 141 (Feb 1935), 125 (B S R)

Azochloramid—Bacterial Action of. *N N* Dichlorazodiacarbonamide, a new chlorine compound, was tested as to its bactericidal action on *Staphylococcus aureus* and *Hemolytic streptococci*, *Cl Welchii*, *C Diphtheriae*, *Pneumococci* types I, II and III, *Ps Pyocyanea* and *Esch Coli*. Both + and - organisms were killed by low concentrations in the presence of blood serum. It can be used advantageously for general bactericidal purposes but its action is impaired in the presence of laked red cells.—SCHMELKES and HORNING. *J Bact*, 29 (March 1935), 323 (A H B)

Coli-Aerogenes Group—Comparative Studies of Presumptive Test Media for. Presumptive tests for 201 pure strains of *Escherichia*, *Aerobacter* and *Citrobacters* were tested for gas formation in plain lactose broth, brilliant green lactose peptone bile, crystal violet buffered broth and fuchsin broth. When small inocula were used (less than 50 organisms per tube) lactose broth and brilliant green lactose peptone bile gave positive tests after twenty four hours of incubation at 37° C for all 201 strains tested. In crystal-violet broth after forty eight hours of incubation using similar small inocula, only 49 per cent of these strains gave positive tests. Very few strains formed gas in fuchsin broth when small inocula were used, and with relatively large inocula only 33 of the 201 strains were able to form gas in forty eight hours.—I SHUNK. *J Bact*, 29 (1935), 163 (A H B)

Fungicides—Chemical Implications from the Testing of. Fungicidal determinations with 1% concentration of tetraiodomethanamine (I) thymol (II) and a mixture of I and II (III), iodine (IV), salicylic acid (V), benzoic acid (VI) boric acid (VII), Arning's tincture (VIII) and sodium chloride (IX) were made using test-tubes for the culture media which had been lined with collodion impregnated with the chemical to be tested. I, II, III, IV, V and VI completely inhibited growth and acted to some extent as fungicides. VII delayed growth and VIII and IX had no effect. When the collodion was not in contact with the medium but was present only in the upper portion of the tube, II alone inhibited growth. In treatment of parasitic infections of

the skin, salicylic acid is ideal in meeting the requirements of a fungicide, boric acid, that of a fungistat since both of the chemicals diffuse rapidly through the skin and readily manifest themselves in the urine—H SHARLIT *Arch Dermatol Syphilol*, 31 (1935), 217 through *Squibb Abstract Bull* 8 (1935) A 294 A H B

Germicidal Substances—Comparison of Resistance of Bacteria and Embryonic Tissue to, I Merthiolate Bacteria and chick embryo hearts were tested separately The phenol coefficient of merthiolate was found for *E Typhi* to be 50, for *Staph aureus* 70 The highest dilution showing no tissue growth was 1 840 for phenol, 1 176,400 for merthiolate The toxicity index, calculated from both results, was found to be for phenol 10 5 and 12 0, for merthiolate 44 1 and 35 3—A J SALLE and A S LAZARUS *Proc Soc Exptl Biol Med*, 32 (1935), 665 (A E M)

Immunity—Relative Importance of Reticulo-Endothelial Tissues and Circulating Antibody The relative importance of the circulating antibodies as compared with the reticulo endothelial tissues in immunity is studied by noting the primary clearance of virulent streptococci *B Anthracis*, *Pneumococcus* type III and the *B Freidlander* from the blood stream and the presence or absence of protective antibodies conferring a passive immunity It was found that the reticuloendothelial tissues can completely clear the peripheral circulation and prevent secondary bacteraemia in the absence of any germicidal power of the whole blood The positive conclusion is of far-reaching importance regarding the use of antisera in treatment of infections, in that the state of the tissues is the chief factor in establishing immunity—F TEALE *J Immunol*, 28 (1935), 133 (A H B)

Pathogenic Fungi—Effect of Dyes on Colonies of Certain The medium (4% peptone, 1% dextrose, 1½% agar pH 5 6) was prepared with the following dyes 2% fluorescein, 1% methylene blue and 1% eosin Y, ½% neutral red, ½% janus green and ½% Wright's stain suspension Growth was more profuse on acid stains The absorption of different dyes is described The microscopic picture was often better, than when specimens grown on ordinary media were stained Double staining was frequently observed—J W WILLIAMS and L GREEN *Proc Soc Exptl Biol Med*, 32 (1935) 625 (A E M)

Pathogenic Fungi—Scalp Products and Hair of Men and Women as Culture Media for Certain Hair autoclaved with water and hair extracts were used A large number of fungi showed more or less prompt development on this medium—J W WILLIAMS *Proc Soc Exptl Biol Med*, 32 (1935) 624 (A E M)

Polomyelitis—Active Immunization Against Tests on human volunteers in which 1 to 3 doses of 5 cc of a 10 per cent virus, inactivated with 1 per cent formalin, were given showed no systemic reaction Similar tests on children showed no discomfort or general reaction followed by appreciable antibody response—M BRODIE *J Am Pub Health Assoc*, 25 (1935), 54 (A H B)

Polomyelitis—Active Immunization against, with Germicidally Inactive Virus Five cubic centimeters of 10% suspension of infective cord of formalized virus proved the best immunizing dose for active immunization of monkeys against intracerebral inoculation of one or more infective doses of the virus of polomyelitis—M BRODIE *J Immunol* 28 (1935), 1 (A H B)

Scarlet Fever Antitoxin—Concentration of The best method of concentration of scarlet fever antitoxin is that followed in the production of diphtheria antitoxin, using 45% ammonium sulphate and heating at 63° C—CIANCIARULO and MALCOLM *J Immunol*, 28 (1935) 47 (A H B)

Staphylococcus Toxoid Prepared by treating staphylococcus toxin with formaldehyde and standardized so that each cc contains the toxoid derived from at least 1000 necrotizing doses of toxin It is a clear straw colored fluid used for the treatment and prevention of recurrent boils and carbuncles, and pustular acne particularly when associated with furunculosis It should not be used where there is generalized blood stream infection with staphylococcus and should not be used when it has become cloudy or turbid It is supplied by E R Squibb & Sons, New York City, in 5 cc rubber capped vials—*Drug Circ*, 79 (Mar 1935), 32 (T G W)

Typhoid Prophylaxis—Efficacy of, in United States Army The Army vaccine may be improved by reverting to a monovalent strain vaccine and increasing its bacterial content Army

and Navy statistics both prove the undeniable value of typhoid prophylaxis—R. PATTERSON
Am J Pub Health, 25 (1935), 258 (A H B)

Water—Bacteriological Control of A review article concerned chiefly with methods used at the Swedish State Veterinary Bacteriological Control Laboratory—H. HEDSTRÖM *Farm Rery*, 34 (1935), 190 (C S L)

Whooping-Cough—Immunization against The mortality of infants under 1 year old afflicted with whooping cough may reach 15%. The disease causes more deaths than diphtheria, measles or scarlet fever. About $\frac{1}{4}$ of the annual 6000 fatal cases occur in children under three years old. The immunizing pertussis vaccine is made from recently isolated hemolytic strains of Bordet-Gengou bacillus. The medium contains about 20% of freshly defibrinated human blood. The 48 hour growth is scraped off and suspended in physiological sodium chloride solution containing 0.5% phenol. After a week the vaccine is diluted to contain 10,000,000,000 bacilli per cc. The active immunity conferred seems to depend on the potency and dosage of the vaccine and the interval (at least 4 months between) injection and exposure. The total dosage after 6 months of age is 8 cc, one cc is injected just under the skin in the deltoid region of each arm, one week later 5 cc are injected in the biceps region of each arm. The optimal age of immunization is probably 7-10 months. Reactions are chiefly local, although there may be a transient rise in temperature. Over 650 children have been immunized, including 150 infants 3 months old, each of whom received a total of 6 cc with negligible local and systemic reaction. The infants have not yet been exposed and it cannot be detected whether immunity was conferred—L. W. SAUER *Am J Diseases Children*, 49 (1935), 69, through *Squibb Abstract Bull*, 8 (1935), A-278

Whooping-Cough—Significance of Bacteriological Methods of Diagnosis and Control of In the preparation of Pertussis Vaccine the cultures are isolated from recent cases which show high titre agglutination, with a smooth strain antiserum, and with a final titre of 1:10,000 to 1:25,000 against rabbit serum using the rapid test. The test antigen is a saline suspension of *B. pertussis*, 1 billion per cc of living virus, which gives a typical skin hemorrhagic necrosis within 24 hours, at the site of inoculation. The organisms are killed and preserved with merthiolate 1:10,000. The cough plate diagnosis is available to physicians for finding the etiological organisms. Statistics indicate the greatest period of infectivity to be the first 3 weeks, with gradual decline from then on—KENDRICK and ELDERING *J Am Pub Health Assoc*, 25 (1935), 147

(A H B)

BOTANY

Fungi. A commemorative address concerning the poisonous fungi such as the *Amanita* and *Boletus*—W. FRIESE *Pharm Zentralh*, 76 (1935), 81 (E V S)

CHEMISTRY

GENERAL AND PHYSICAL

Emulsions—Studies in—III. Lipin-Containing Substances as Emulsifiers. Aqueous dispersions of lipins from various sources and of various ages yield dual emulsions on shaking by hand with fat solvents. At oil-rich phase volume ratios, both types of emulsions appear to be simultaneously present (possibly as complex emulsion systems), as far as can be judged by drop tests. It is thought that a possible explanation of this behavior might be the presence in the lipins of opposite type emulsifiers, which simultaneously exert their actions to some extent incidentally of each other—R. M. WOODMAN *J Soc Chem Ind*, 54 (1935), 70T (E G V)

INORGANIC

Calomel—Physical and Chemical Investigation of Sixteen specimens of calomel of at least seven different origins were examined. All were assayed and other U. S. P. tests applied. All were examined microscopically. Detailed descriptions are given. The different types of calomel described in the literature, differentiated by their methods of manufacture and their titles are discussed. The survey showed the high quality of the specimens and illustrated variance in size and type of particles—C. H. LAWALL *J Am Pharm Assoc*, 24 (1935), 97

(Z M C)

Potassium Permanganate—Electrolytic Manufacture of For some time it has been considered difficult to produce potassium permanganate commercially by electrolytic methods. Several processes have been evolved and the outcome of experimentation has been the modern method of electrolytically producing the pure salt from the crude metal. The process is as follows. Anodes containing 80% of manganese are suspended in the middle compartment of a diaphragm cell, made by dividing a sheet iron tank into three chambers by means of prepared asbestos paper diaphragms. The cathodes are made of iron, while the electrolyte is made up of two different solutions. The catholyte is composed of a solution of caustic potash and the anolyte consists of potassium carbonate. The current efficiency tends to rise somewhat with the anodic current density, and requires to be accurately registered. The plant consists of cathodes of sheet iron surrounded by porous diaphragms. The temperature of the bath is maintained throughout the day by a steam coil, and the electrolytes are kept in motion. The main features which influence the course of the electrolysis are the composition of electrolyte and anode, the current density and the temperature. As the manganese content in the anode increases, the current efficiency rises rapidly, but the voltage only increases very slowly, and the energy consumption per pound of permanganate produced tends to fall. The final stages in the process consist of concentrating the electrolyte and recovering the crystals of permanganate, after which the mother liquors are returned to the electrolysis bath.—*Chem. and Drug*, 122 (1935), 270 (T G W)

Sodium Hypochlorite—Easy Production of A brief note on the production of sodium hypochlorite by passing a solution of ordinary salt and sodium bicarbonate through an electric cell.—*Med. Rec.*, 141 (Feb 1935) 162 (B S R)

ORGANIC

Alkaloids

Cocaine—Reactions of Solutions of, on Sterilization and Storage A brief review of the literature on the subject is given along with criticisms. The chief cause for the disagreement of the literature lies in inaccurate methods of analysis of the cocaine solutions. A method of analysis as applied to morphine is discussed and applied to cocaine. The method used is briefly as follows. 10 cc of a 1% solution of cocaine hydrochloride is treated with 10 cc of isopropyl alcohol-chloroform mixture (1 volume and 3 volumes) made alkaline with 0.5 Gm sodium carbonate and shaken vigorously for one minute. The organic solvent drawn off, the extraction repeated twice, the combined extractive being evaporated on a water bath, the residue dissolved in excess of 0.1 N hydrochloric acid and back titrated with 0.1 N sodium borate solution. An examination of the dissociation constants reveals that the substances formed in the hydrolysis are too weakly basic to affect the end point when methyl orange is used in the titration and the method is thus adaptable to the determination of cocaine in solutions partially hydrolyzed. The determination of benzoic acid is as follows. 2 cc of a 1% solution of cocaine hydrochloride are completely hydrolyzed by boiling with 2N sodium hydroxide. The solution is transferred quantitatively to a separatory funnel, is acidified to methyl orange using 2N hydrochloric acid, extracted three times with the isopropyl alcohol-chloroform mixture, the combined extractive evaporated on a water bath, cooled and titrated with 0.1 N alkali using phenolphthalein. Using these two determinations the progress of the hydrolysis of cocaine solutions is studied under different conditions, the results being compiled in tables. It is shown that if alkali free glass ampuls are used, 1% solutions of cocaine hydrochloride in distilled water can be sterilized at 100° for 30 minutes without hydrolysis, and if it is made 0.001N with hydrochloric acid it can be sterilized in a steam autoclave at 120° for 20 minutes. Contrary to the literature, it is shown that the presence of phosphate as a buffer does not stabilize the solution but rather accelerates the hydrolysis. The effect of long standing of solutions of cocaine prepared as above is taken up and also the effects of filtration of similar solutions through a Seitz filter.—S. A. SCHOU and E. HEM, *Pharm. Acta Helv.*, 10 (1935) 31 (M F W D)

Novocaine—Reactions of Solutions of, on Sterilization and Storage Although novocaine was for several years the only local anesthetic in use, the knowledge of its stability and the effect of sterilization on its solutions is quite limited. A few of the methods of the estimation of novocaine reported in the literature are reviewed and their defects pointed out. Novocaine (the hydrochloride of *p* aminobenzoyl diethylaminoethanol) on hydrolysis yields *p* aminobenzoic acid

and diethylaminoethanol, and the pH of the solution obtained is the result of the basic tendency of novocaine and the amine liberated and the acidic tendency of the p aminobenzoic acid. Novocaine could thus be determined by the same method as cocaine as given by S. A. Schou and E. Heim [*Pharm Acta Helv*, 10 (1935), 31]. In determining the novocaine in a solution having undergone partial hydrolysis, several difficulties are encountered because of the mixture of possible substances, and in the addition of the proper amount of acid so as to precipitate quantitatively the p aminobenzoic acid. After several tests the following procedure was worked out: 2 to 10 cc. of a solution of novocaine is treated with 0.5 Gm. sodium carbonate in a separatory funnel and shaken out three times with isopropyl alcohol-chloroform (1 volume and 3 volumes), the extractive being filtered into and combined in a second separatory, the solution treated with 2*N* hydrochloric acid drop by drop until a red color appears with methyl orange, then shaken out three times with the same organic solvent, the extractive being filtered and evaporated on a water-bath, the residue dissolved in water and titrated with 0.1*N* alkali using phenolphthalein (p aminobenzoic acid), the extractive of the alkaline solution is shaken out with 10 cc. 0.1*N* hydrochloric acid, and the excess of acid then back titrated with 0.1*N* alkali using one drop of methylene blue and two drops of methyl red (novocaine and amine). The influence of sterilization on 2% solutions of novocaine in water in 0.001*N* hydrochloric acid, and in the presence of 0.15*M* phosphate is compiled in a table. The solution in 0.001*N* hydrochloric acid is most stable, only 2% of the novocaine being split and the pH not changing at all after autoclaving at 120° for 20 minutes. For maximum stability the pH of the solution must not exceed 5.0 and the ampuls must be of Jena glass. It was found that 0.01*N* hydrochloric acid produced practically no hydrolysis, and 0.1*N* only a slight amount but 1*N* destroyed more than half of the novocaine on autoclaving at 120° for 30 minutes. Analysis of several old samples of solution ranging from 0.5% to 5% shows that the solution is fairly stable, a maximum of 5% deterioration being shown by a sample seven years old.—J. ABILDGAARD [*Pharm Acta Helv*, 10 (1935), 38] (M. F. W. D.)

Strychnine Sulphate—Adsorption of, by Various Charcoals and by Lloyd's Reagent. Research was undertaken to determine diminution of potency of strychnine sulphate solutions in contact with commercial charcoals and with Lloyd's reagent. Seven charcoals were tried. Experimental work is described. There was wide variation. One charcoal showed complete adsorption up to nearly 5 Gm. per L. Willow charcoal which is the type usually used in pharmaceutical preparations was the poorest, taking up only 11 per cent when the concentration was 1 Gm. per L. Lloyd's reagent took an intermediate place and differed from the others in that the percentage adsorbed was only 11 per cent when the concentration was 1 Gm. per L. One charcoal required more than 24 hours to reach an equilibrium. Some absorbed less salt from alcoholic than aqueous solution. Langmuir's equation represents the adsorption curves better than Freundlich's.—J. F. SUCHY and R. V. RICE [*J. Am. Pharm. Assoc.*, 24 (1935), 120] (Z. M. C.)

Essential Oils and Related Products

Cymbopogon Georngu—Volatile Constituents of. The volatile oil derived from the inflorescence of the graminaceous plant *Cymbopogon Georngu*, Honda, has as constants α_{D}^{20} — 34.96°, d_{4}^{20} 0.9585, n_{D}^{20} 1.52128, acid no. 0, sap no. 12, sap after acetyl 30.6, methoxyl 25.42%. Of the terpenes present camphene was identified by conversion into iso borneol, m. p. 212°. Sesquiterpenes constituted an important portion of the oil. The cadinene present, α_{D}^{25} — 106.11°, yielded a hydrochloride, m. p. 117° and a hydrobromide m. p. 123°. A small quantity of borneol was isolated. Elemicin, estimated from the methoxyl content of the oil, amounted to 57%. iso-elemicin dibromide, m. p. 89° to 90°, permanganate oxidation yielded gallic acid trimethyl ether, dihydroelemicin, by reduction with platinum oxide catalyst, had b. p. 120° to 125° at 3 mm. The b. p. recorded by Will (*Ber. d. d. Chem. Gesell.* 21 (1888), 2025) should probably read 264°.—T. KARIYONE and A. MAJIMA [*J. Pharm. Soc. Japan* 55 (1935), 14 to 16] (R. E. K.)

Oils of Flacourtiaceæ—Actual Situation of Production of, in View of Their Utilization in Therapeutics. A survey of the conditions surrounding the cultivation of the plant and the therapeutic use of the oils obtained from certain members of the Flacourtiaceæ family. Remarks on the method of production of the oil, as carried out at the Pondichery Laboratories, are given. The author believes more intensive studies in the cultivation of the plant should be instituted.

and attempts should be made to improve the oil from the standpoint of its acid content—M FRANCOIS *Bull sci pharmacol*, 42 (1935), 24 (C T I)

Fixed Oils, Fats and Waxes

Chaulmoogra Oils in Pharmacopœas and in Commerce The reaction of Dymock (H_2SO_4 causes the separation of a red resinous material leaving the oil green) and the index of refraction ($n_D^{20} = 1.4842-1.4888$) should be included in the requirements of the Pharmacopœa. The inferior limit of acidity and the superior limit of optical rotation should be omitted. The 10% solution in chloroform (10 Gm. in 100 cc.) must give a rotation of at least $+5^\circ 12'$ —A. and C. CHALMETA *La Farm. Mod.*, 46 (1935), 63 and 94 (A E M)

Chinese Insect Drug, Chiu-Hsiang-chung—Study of Oil of The insect yielding the Chinese drug Chiu Hsiang chung is *Aspongopus chinensis*, Dallas, which is found in Southern China and Formosa. The name first appears in the "Sheh sheng chung miaofang" and afterwards was introduced into the 'Pan tso kan-mu' one of the old Chinese Materia Medicas. General Ho Ching of Szechuan Province mentioned this drug about 1526 in his Biography of the Min Dynasty which proves that the drug had come into use more than 400 years ago. The oily material examined was in ether extract of the insect. Stearic, palmitic and oleic acids were identified. They exist partly combined and partly free. The oil also contains a small amount of an aldehyde or ketone, to which the peculiar odor of the oil is attributed—L. C. WAUNG *J. Pharm. Soc. Japan* 55 (1935), 8 to 14 (R E K)

Cod Liver Oil—Iodine Content of The iodine content of twenty representative samples of American cod liver oil was determined. The iodine apparently varies with the locality in which the oil is produced. The average values for the different localities in parts per billion are: Nova Scotia 13,260, Gaspe Peninsula 11,250, Newfoundland 8360, the area around George's and Brown's Banks 5340, Massachusetts 4930 and Maine 3950. Remington's values for the iodine content of fruits and vegetables of South Carolina are reproduced—A. D. HOLMES and R. E. REMINGTON *Am. J. Diseases Children*, 49 (1935), 94, through *Squibb Abstract Bull.* 8 (1935), A-251

Fat—Production of, from Glucose by Molds Cultivation of *Penicillium javanicum* van Beijma in Large-Scale Laboratory Apparatus. A survey of sixty-one organisms of the genera *Aspergillus* and *Penicillium* showed nine *Penicillia* and one *Aspergillus* whose mycelia contained more than 15 per cent ether soluble material. An intensive study of *Penicillium javanicum* van Beijma showed that its mycelium may contain as much as 41.5 per cent fat, depending on culture conditions. In flask cultures, media containing 40 per cent glucose gave mycelia of highest fat content. A cabinet for experimental study of shallow pan fermentations is described, and representative results of culture experiments conducted therein are presented. In such cultures, increase of the glucose content of the medium apparently does not increase the fat content of the mycelium of *P. javanicum* as it does in flask cultures. The free fatty acid content of the fat obtained from the mycelium grown on 30 and 40 per cent glucose solutions is much higher than that of fat similarly derived from 20 per cent glucose solutions. In addition to fat the mycelium of *P. javanicum* yielded a complex carbohydrate and a chitinous material—G. E. WARD, et al. *Ind. Eng. Chem.*, 27 (1935), 318 (E G V)

Fats and Oils—Spoilage of III. Rancidity and Constitution of Oleic and Elaidic Acids. A continuance of the review and discussion from the *Allg. Oel- und Fett-Ztg.* (1933), 11-12, of the literature on the properties of oleic and elaidic acids relative to the molecular structure—R. NEU *Pharm. Zentralh.*, 76 (1935), 65 (E V S)

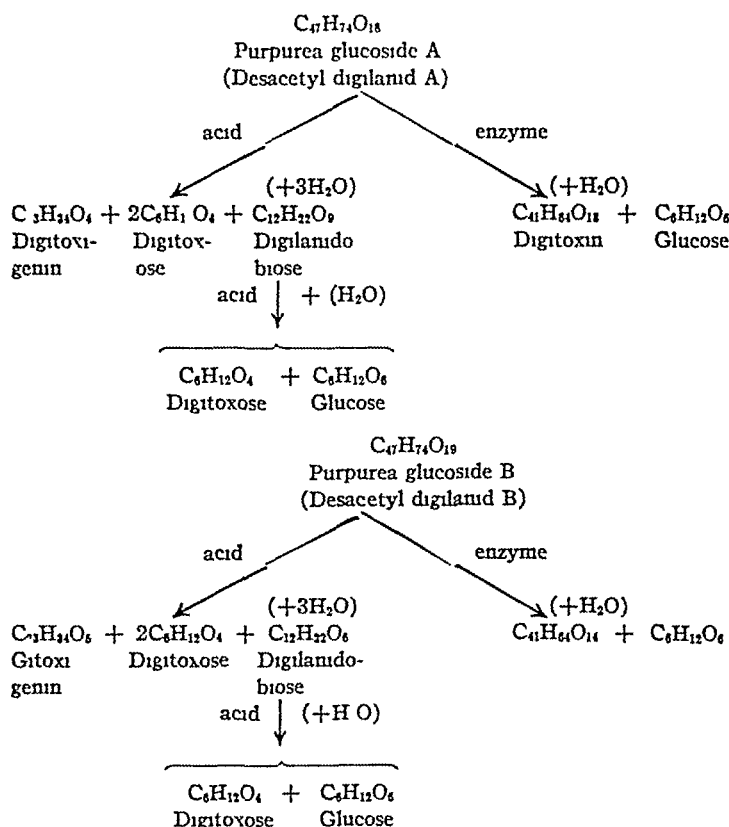
Glycosides, Ferments and Carbohydrates

Beechwood Lignin—Product of Reaction of Carbohydrates in the Determination of The difference between the woods of red beech and pine chemically is in the high per cent of methoxyl groups and low per cent of lignin (beech 24%, pine 29%). The theoretical yield of lignin in beechwood was calculated at 27-33% against the actual yield which was 24%. Lignin is not found in woods as such but is only a by-product of the chemical reaction. The beechwood was mixed with acids and most of it dissolved. The mixture was diluted with water, a precipitate formed. The product was methylated cellulose anhydride with a formula of $2C_6H_{10}O_4 \cdot H_2O$ with one methoxyl and 2 cellulose anhydride groups. At $15-20^\circ$ with concentrated hydrochloric acid this changed to lignin which had a methoxyl group content of 21%. This proved that the collected beechwood lignin was not a constituent of the wood but a by-product of the chemical reaction.

tion, formed with a low temperature and the addition of an acid. A change of methoxyl group is also evident. The appearance of quantities of cellulose anhydride shows that hydrolysis is not completed in the wood. The reaction of methoxyl group during the addition and reaction of acid has been proven. Oxidation of woods is not easily explained. There is a possibility of a chemical affinity between the carbohydrate and the process of oxidation—R. S. HILPERT and H. HELLMAGE, *Ber*, 68 (1935), 380 (G. B.)

Chenopodium Ambrosioides L.—Saponins of Some plant parts of *Chenopodium ambrosioides* L. contain saponin, especially the roots (2.5%). The seeds, leaves and branches are relatively poor in saponins. The principal constituent is a neutral saponin, but it also contains a saponin which gives an acid reaction. For purification of the saponins, 96% alcohol was found to be the best solvent to use. The pure neutral saponin is amorphous, readily soluble in dilute alcohol. The m.p. is 196–200°. The product has little hemolytic power (hemolytic index 1/40,000). The saponin content of the root increases naturally with the age of the plant, but it can be further increased by the use of a fertilizer—S. GRIFINGER, *Widomosci farmac*, 61 (1934), 275–277, 289–291, through *Chem Zentr*, 106 (1935), 746 (G. B.)

Digitalis Purpurea—Glucosides of *Purpurea* glucosides A and B are claimed to be the true glucosides of *Digitalis purpurea*, their relation to the other so-called glucosides of this plant being given below



These glucosides differ from the corresponding ones present in *D. lanata*, i.e., digiland A and B, by having one acetyl group less. It seems that the C-series of lanata glucosides disclosed in the form of digitoxin, are not present in *Digitalis purpurea*. The genuine glucosides of *Digitalis purpurea* have thus far been obtained only in amorphous form. Details of the separation (differential solubility) and isolation of the two glucosides as well as their enzymatic and acid hydrolysis are given—A. STOLL and W. KRIES, *Helv Chim Acta*, 18 (1935), 120, through *Squibb Abstract Bull*, 8 (1935), A-360

Lignin—Presence of, in Leaves The principal constituents of leaves are mostly cellulose and a little lignin, which are usually found in the fibrovascular bundles. In order to better establish the properties of the framework (venation) of leaves experiments were tried with leaves of beech, plane and hazel, the type leaves used were green and yellow. To remove wax and resin organic solvents were used. The extraction using either water or benzol alcohol as solvent proved higher in the green leaves than in the yellow leaves. Trichlor-ethylene dissolves out more extract from the yellow leaves. This would indicate that the carbohydrate undergoes further changes so that more extract is obtained with organic solvents than water. The same changes occur using acids. Such variations are probably due to chemical changes in the leaves. All leaves were collected in late fall, when the proteins in leaves underwent chemical changes. The lignin obtained from leaves is 59–60% poorer in carbon than that lignin obtained from woods. Lignin from leaves is more soluble in water than that from straw and woods. Chemically leaf lignin is similar to wood lignin. Lignin combines readily with acids and so makes the material easy to work with. Different quantities of lignin are extracted from leaves when using sulphuric or hydrochloric acids. The quantity of lignin obtained with acids after the leaves have been extracted with benzol alcohol solvent is different. In green leaves the total extract is greater in lignin output than that found in yellow leaves. Sugars under the influence of acids and low temperature become resinous and hard so that they cannot be separated out together with lignin. For plant parts having no lignin a low temperature is useless since such plants hydrolyze poorly. Throughout the experiment 72% sulphuric acid was used. Sodium sulphide proved to be a solvent for cellulose especially on some plants belonging to the family Gramineae. It was then used as a solvent for fibrous leaves. The mesophyll of leaves is resistant to the solvency of sodium sulphite but fibrovascular bundles completely dissolve in it. Sodium hydroxide is not such a good solvent for cellulose. The product obtained with either sodium sulphite or sodium hydroxide is not pure cellulose but in combination as hemicellulose. The method of detecting pure cellulose of Cross and Bevan was employed, not more than 19% of pure cellulose was obtained although 80% of the extract from leaves went into solution. This makes evident the theory that most of the lignin occurs in chemical combination with other carbohydrates. Wood-lignin contains from 13–15% of methoxyl groups (OCH_3) in contrast to leaf-lignin of only 4% of (OCH_3) group. Methoxyl groups under the influence of acids become hard and refuse to go into solution. The framework (venation) of foliage plants contain hemicellulose, in contrast to alfalfa whose cellulose is readily soluble in caustic soda. The leaf of alfalfa trails to the ground, therefore must support itself, hence its framework is composed mostly of cellulose, the same is true in *Chamerops humilis*, etc., which have no stems. The leaves of these plants contain cellulose fibres which are put in solution with caustic soda. Cellulose and not lignin give support and strength to leaves.—R. S. HILPERT and R. WAGNER *Ber* 68 (1935) 371 (G B)

Maple Syrup—Aerobacter Aerogenes as Cause of Ropiness in A group of bacteria was isolated from the sap of *Acer saccharum* which, when inoculated into sterile sap or dilute maple syrup, produced a ropy maple syrup upon being concentrated to the consistency of syrup. Since these bacteria were isolated from the sap from which the ropy maple syrup was produced in the sugar bush it is evident that they were responsible for the condition. The morphological, physiological and cultural characteristics of the bacteria responsible for this condition corresponded in all essential details to those of *Aerobacter aerogenes*. The addition of an amount to acetic acid of approximately the acidity found in the fermented sap did not influence the consistency of the evaporated sap. The addition of a similar amount of lactic acid did influence its consistency. Neutralizing the acidity of fermented sap reduced somewhat the ropy condition of the concentrated sap.—F. W. FABIAN and H. H. BUSKIRK *Ind Eng Chem* 27 (1935), 349 (E G V)

Maté—Tannin in The composition of maté is of considerable importance because of its wide use in South American countries as a beverage in a manner similar to our very popular tea. The authors of this paper have made an elaborate investigation of its tannin content and summarize their conclusions as follows. (1) 'It has been shown that maté is completely free from gallocatechin tannin. This is a matter of considerable importance, in view of the effects of ordinary tea upon the digestion. (2) It has also been shown that maté contains an appreciable amount of a natural yellow plant coloring matter. It is reasonably certain that this coloring matter is a derivative of flavone. (3) Certain evidence has been obtained pointing to the presence in maté of caffetannin or some closely allied compound. (4) Comparisons have been made with coffee and

tea, and attention has been drawn to important differences and similarities"—W A WOODARD and A N COWLAND *Analyst*, 60 (1935), 135-145 (A H C)

Primula Root Data are given showing the saponin content of the root of *Primula veris* as revealed by the hemolytic test of Kofler and Adam—A TOMINGAS *Pharmacia*, 14 (1934), 197-212, through *Chem Zentr*, 106 (1935), 594 (G B)

Saponins and Sapogenins—III Sapogenins Obtained from *Chlorogalum Pomeridianum* Hydrolysis of the alcoholic extract of the bulbs of *Chlorogalum Pomeridianum* or California soap plant, a plant used as fish poison by the California Indians, yielded two sapogenins. One, reported for the first time and named chlorogenin by the authors, has the formula $C_{26}H_{44}O_8$, melting point 273-276°, and isomeric with gitogenin. The other has the formula $C_{25}H_{42}O_8$ and appears to be identical with tigogenin—P LIANG and C R NOLLER *J Am Chem Soc*, 57 (1935), 525 (E B S)

Sugars and Sugar Mixtures—Hygroscopicity of A definite relationship between the sucrose, invert sugar and water content of various sugars and the relative humidity of the surrounding atmosphere has been found, and the equilibrium points have been graphed. The equilibrium relative humidity or vapor pressure of pure sucrose, dextrose, fructose, invert sugar or sucrose invert sugar mixtures with varying percentages of water can be determined directly from the graph—J H DITTMAR *Ind Eng Chem* 27 (1935), 333 (E G V)

Other Plant Principles

Brucella Abortus, Toxic Principles—1 Preparation, Toxicity and Biochemical Nature of Alcoholic Precipitate Alcoholic precipitates were prepared from shaken and filtered suspensions of *Brucella abortus*. These precipitates were highly toxic for guinea pigs by intraperitoneal injection. The toxic and antigenic fraction was water soluble. Filtration did not modify the toxic effect. Dialysis removed some of the lethal substance in one trial but did not affect the suspension in a subsequent experiment. Varying volumes of alcohol did not affect the toxic and antigenic qualities of the precipitate. Preparation of these precipitates on several occasions gave rise to symptoms simulating undulant fever in a hypersensitive human subject. Preliminary biochemical examination suggested that the precipitate consisted almost entirely of carbohydrates—R GWATEIN *Can J Research*, 12 (1935), 115 (S W G)

Digitalis—Flavones from A flavone dye luteolin or 5,7,3',4'-tetrahydroxyflavone has been reported to be obtainable from *Digitalis purpurea* and an unidentified dye, $C_{15}H_{12}O_8$, has been isolated from *D. lutea*. Karrer isolated an entirely different flavone which he calls thapsin, from the dried, pulverized leaves of a Spanish species of *Digitalis* which is probably *D. Thapsi*. The new dye crystallized from hot glacial acetic acid in beautiful, lemon-yellow prisms, m 224° (uncorr). It proved readily soluble in chloroform and methyl acetate, less soluble in alcohol, difficultly soluble in dilute alcohol and in ether, and insoluble in water and petroleum ether. It dissolved in alkalis with a yellow color but could be reprecipitated with acid. From a study of the decomposition products of the methylation and ethylation products of the dye the probable structure was arrived at—W KARRER *Helv Chim Acta*, 17 (1934), 1560, through *Squibb Abstract Bull*, 8 (1935), A-359 (S W G)

Phosphatide Preparations A phosphatide material such as that derived from grain or vegetable material is added to a neutral liquid such as benzene or alcohol and then mixed with dried purified and ground germs of grain. The product is a powder suitable for therapeutic use—R ROSENBUSH and G REVEREY *U S Pat* 1,988,050, Jan 15 1935 (S W G)

Phytochemical Notes—No 112 Preliminary Chemical Examination of *Corydalis Aurea* The air dried herb was extracted with alcohol and this extractive studied. Dimyritylcarbinol was isolated. An optically active alkaloid colorless in sulphuric acid red with nitric was found. Determination of methoxy groups gave 33.47 and 32.7 per cent. An optically inactive alkaloid probably identical with a previously reported one, $C_{16}H_{22}O_4N$ shows four methoxyl groups. An insoluble optically inactive alkaloid containing no methoxy groups seemed similar to one which Chou compares to protopine—H EPPSON *J Am Pharm Assoc* 24 (1935), 113 (Z M C)

Vegetable Lecithin—Antioxidant Properties of Vegetable lecithin is shown to possess antioxidant properties in vegetable oils where the autoxidation is catalyzed by an active metal. It is believed that it may serve as an efficient antioxidant in the protection of edible oils if used in

the amounts of 0.05 to 0.1 per cent by weight —E I EVANS *Ind Eng Chem*, 27 (1935), 329 (E G V)

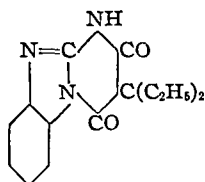
Unclassified

Acidum Aceticum This article is No 3 of a series of extended reviews of the organic, chemically pure substances official in the Belgian Pharmacopœia. The review is a very complete one and is divided into the following sub heads: Synonyms, History, Foreign Pharmacopœias, Preparation, Physical Properties, Chemical Properties, Identification Reactions, Official Requirements, Uses, and Literature. Each division is further subdivided and its subject matter is discussed at length with equations, calculations, tables, etc —V EVRARD *Pharm Tijdschrift* 13 (1935), 4-15 (E H W)

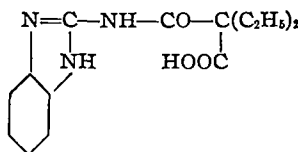
Amine Salts of Antimonic and Benzenestibonic Acids Powders (colorless to yellowish) suitable for use by injection against infectious diseases. Obtained by reaction of an antimony acid or a stibonic acid, such as a benzenestibonic acid such as $\text{RSbO}(\text{OH})_2$, where R is a phenyl radical which may be substituted by halogen, amino, substituted amino, hydroxyl groups or by reaction upon the acids of antimony in their higher molecular complex state of a primary, secondary or tertiary amine such as methylamine, diethylamine, piperazine, quinine etc at room temperature or at water bath temperature. The two components are allowed to react either in aqueous solution or in a suitable organic solvent, such as methyl or ethyl alcohol. It is best to finely suspend the organic or inorganic antimony acid in water and introduce in small portions an amine until the whole of the antimony acid has dissolved. The quantities of the two components of the reaction may be varied generally less than an equivalent of the amine calculated on the stibonic or antimonic acid being sufficient, due to the high molecular state in which the acids of antimony generally are present. The complex state prevents the representation of the formulas of the products. The reaction between the antimony acids and the amines appears as a neutralization of the acidity of the antimony acids by the amines. The new compounds may be obtained by evaporating their solutions to dryness or by adding an organic precipitant, such as ether or acetone —H SCHMIDT (to Winthrop Chemical Co.) U S Pat 1,988,632, Jan 22, 1935

Amines and Diamines with Ethylene Grouping—Chemical and Physiological Study of A review giving methods of preparation and the physiologic properties of these amino compounds —G BENOIT and R HERZOG *Bull sci pharmacol* 42 (1935), 34, 102 (C T I)

2-Aminobenzimidazole—Structure and Derivatives of 2-Aminobenzimidazole is prepared from *o*-phenylenediamine in aqueous suspension and freshly prepared bromocyanogen. It is condensed with diethylmalonyl chloride in anhydrous pyridine solution giving 1-diethylmalonyl-2-amido-benzimidazole, melting point 243°C . (I) The physiological action of this derivative of barbituric acid derivative is being investigated. Treatment with aqueous alkali opens the ring presumably between the N atom common to both rings and the vicinal carbonyl group to give



I



II

2-benzimidazolyl amido diethyl malonic acid

an acid melting point 214° . (II) Treatment with acetic anhydride removes a molecule of water from II and gives the ring form again. The methyl ester of II melting point 116° is prepared by saturating an ether solution with diazomethane. With carbon bisulphide an alcoholic solution of I gives after 50 hours heating 2,2-benzimidazolyl thiourea melting point 208° . These reactions characterize I as 2-aminobenzimidazole with a primary amine grouping, rather than as phenylene guanidine. Benzaldehyde reacts with I to give a product not completely characterized —GIUNIO B CRIPPA and GIULIO PERRONCITO *Gaz Chim Italiana*, 65 (1935) 38-43 (A E W)

Antimony Compounds—Complex Pentavalent, with Aromatic Polyhydroxy Compounds

The Compounds are prepared by causing antimonie acid or a water-soluble salt to react with an aromatic polyhydroxy compound containing at least two hydroxyl groups in ortho positions to each other and being substituted by at least one acid group capable of forming a water soluble salt, and which polyhydroxy compound may be otherwise substituted. Suitable aromatic acids are pyrocatecholmono- and disulphonic acid, pyrogallolmono and disulphonic acid, pyrocatecholcarboxylic acid, protocatechuic acid, gallic acid, etc. The quantities of the two components reacting with each other may be varied within wide limits, the proportions used determining the antimony content of the products. Generally molecular quantities of reactants are used. The process is carried out by dissolving the reactants in water and heating the reaction mixture preferably on a water bath for some hours. When starting with a water soluble salt of an aromatic *o* dihydroxy carboxylic or sulphonic acid and a water-soluble antimonate, the complex compound is formed immediately after mixing the components. Several examples with details of procedure are given—H. SCHAUDT (to Winthrop Chemical Co.) U S Pat 1,988,576, Jan 22, 1935.

Calcium Gluconate Solutions—Stable Clear, stable, sterile, supersaturated aqueous solutions suitable for intramuscular injections free from irritation of the tissues contain calcium gluconate 4-20 and calcium mannate 1-3%. U S Pat 1,989,565 U S Pat 1,989,566 deals with stable solutions containing calcium gluconate 4-25% and 0.5-25% of calcium salts of monocarboxylic acids derived from polyaldoses such as calcium lactobionate—A. STOLL and E. BURCKHARDT (to Chemische Fabrik vorm Sandoz) Jan 29, 1935.

ω -Chloroacetylpyrocatechol—Some Thiazol Derivatives of The author condensed, 3,4-hydroxy- ω -chloroacetophenone in acetone with thiourea or derivatives of thiourea, obtaining the corresponding thiazol derivatives. The following were prepared: 2-Amino derivative, hydrochloride, m p 235° to 236°, acetyl derivative, m p 268°. 2-Allyl amino derivative, m p 208° to 209°, hydrochloride, m p 213°. 2-Phenyl-imino, 3-phenyl derivative, m p 251° to 252°. The 2-ortho tolyl-imino, 3-ortho tolyl derivative, m p 130°, hydrochloride, m p 185°. The analogous meta-derivative, m p 227° to 228°, hydrochloride, 226° to 227°. The analogous para-methyl derivative, m p 280° to 281°, hydrochloride, m p 170°. The analogous 2 para hydroxy-phenyl imino, -3 para-hydroxy phenyl derivative, hydrochloride m p 198° to 200°. The proof of structure was established by analyses, by a negative reaction for the CO group with phenyl hydrazine and a negative Grote reaction. The parent thiazol derivative was synthesized by condensing potassium thiocyanate with the ω -chloroacetylpyrocatechol. The corresponding derivative of acetophenone differed from the thiocyanate prepared from acetophenone by Dyckerhoff—ZENICHI HORII *J Pharm Soc Japan*, 55 (1935), 6-8. (R. E. K.)

Chlorinated and Brominated Hydroxybiphenyls A halogenated hydroxybiphenyl is prepared by the reaction of free halogen with hydroxybiphenyl in a solvent such as carbon disulphide or glacial acetic acid. Keeping the temperature below 20° facilitates the production of a monohalo derivative such as 2-hydroxy 5 bromobiphenyl or 2 hydroxy 5 chlorobiphenyl. Some 3 halo- and 3,5 dihalo-derivatives are also formed. The products possess strong bactericidal action—W. G. CHRISTIANSEN, E. MONESS and S. E. HARRIS (to E. R. Squibb and Sons) U S Pat 1,989,081, Jan 29, 1935.

Derris Resin—Constituents of A dimorphic substance, m p 189° and 192-194°, is isolated in very small yield from a derris resin which contains only a small amount of rotenone. The substance probably has the formula $C_{24}H_{12}O_7$, it differs from the isomeric tephrosin in being phenolic and in not readily losing the elements of water, and from the isomeric toxicarol in being colorless, it has insecticidal properties. Toxicarol does not exist as such in derris resin, evidence shows that only small quantities of *dl* deguelin or tephrosin exist as such in derris resin—R. S. CAHN and J. J. BOAM *J Soc Chem Ind*, 54 (1935) 42T. (E. G. V.)

1,2-Dimethyl-Naphthalene—Isolation of, from Coal Tar So far four dimethyl naphthalenes were known, that is 1,6, 2,6, 2,7 and 2,3 dimethyl-naphthalene. All 4 isomers were easily separated with the exception of 1,6 dimethyl-naphthalene which requires special care in being crystallized out from sulphonic acid. The discovery of the 5th isomer was that of 1,2 dimethyl naphthalene. The separation and washing of the crystals were done with the aid of picrates. The material used was tar oil, the process of extraction employed was fractional distillation. Especially hard was the separation of 1,2 dimethyl naphthalene from the isomer 2,3 dimethyl naphthalene, which has the same boiling point, but higher melting point. The formation of ace

naphene during the fractional distillation, was easily removed using dilute sulphuric acid. The distillate was then mixed with picric acid and alcohol, and after several recrystallization processes beautiful picrate crystals separated out. The fractional distillation was done at a temperature of 266–270° and the yield was that of 23% of 1,2 dimethyl naphthalene in heavy oil coal tar. To prove the constitution of 1,2 dimethyl naphthalene the method given by F. Mayer and A. Sieglitz was used. Its properties such as boiling point, refractive index, n_D^{20} , n_D^{25} were identical with hydrocarbons obtained from coal tar, even the picrate and its mixture showed the same melting point. The splitting up with chromic acid to obtain α chinons with potassium permanganate resulted in 1,2,3,4 benzotetracarboxylic acid and after the oxidation of the hydrocarbons with nitric acid naphthalene-dicarboxylic acid was obtained. The dimethyl ester of this acid corresponds with the synthetic product. The discovery of 1,2 dimethyl-naphthalene in coal tar is important because (coal tar) hydrocarbons give us one of the few true oils, and because there are only 4 true liquid hydrocarbons obtained from it, namely α methyl-, 1,6, 1,2 dimethyl naphthalene and *m* methyl diphenyl—O. KRUBER and W. SCHADE, *Ber.*, 68 (1935), 11 (G. B.)

Glycerin—Regeneration of, in Production of Glycerophosphates In the production of glycerophosphates the free glycerin is recovered with alcohol in which it is soluble while sodium glycerophosphate, for example is not. In this way 25% of the glycerin is recovered. The product contains but traces of sodium chloride, and a little sodium glycerophosphate, and thus can be esterified without further purification with sodium monophosphate—N. O. BOLZ and R. W. MURACHWER, *Chimiko farmazew Tischeskaja Promyschlennost* (1934), 25–26 *Pharmaz. Fabrik Im Karpow*, through *Chem. Zentr.*, 106 (1935), 594 (G. B.)

β -Iodohydroxynaphthalenedisulphonic Acids The compounds are slightly colored in the dry state, soluble in water and suitable for therapeutic use and for use as intermediates for the manufacture of other compounds. They are obtained by heating in an aqueous medium the diazonium iodides of beta diazohydroxynaphthalenedisulphonic acids—A. STOLL, A. BINKERT and W. KUSSMAUL (to Chemische Fabrik vorm Sandoz). U. S. Pat. 1,988,222 Jan. 15 1935.

Lactic Acid—Physical Characters of, in Course of Aging Of the following physical constants studied: density, viscosity, surface tension, conductivity and p_H values, it is the surface tension of a particular acid which permits the determination of the degree of concentration, purity and age. Freshly prepared lactic acid of the French Codex has a S. T. of 46 dynes/cm—W. KOPACZEWSKI, *Bull. sci. pharmacol.* 42 (1935) 87 (C. T. I.)

Penicillium Charlesii—Molecular Constitution of, Metabolic Acids of A series of acids produced from glucose by *Penicillium Charlesii* G. Smith is shown from a study of the products of hydrolysis, bromination, reduction and reactions with dinitrophenylhydrazine and diazomethane to have the following structures: 1. γ -methyltetronic acid $C_6H_8O_3$; carolic acid $C_6H_{10}O_4$ in non aqueous solvents, carolic acid $C_6H_{10}O_4 + H_2O$ in aqueous solution, carolinic acid $C_6H_{10}O_5$, carlic acid $C_{10}H_{10}O_6$ in non aqueous solvents, carlic acid $C_{10}H_{10}O_6 + H_2O$ in aqueous solution, carlosic acid $C_{10}H_{12}O_8$. Carolic, carolinic, carlic, carlosic and synthetic α acetyl-tetronic acids all contain the α keto substituted tetronic acid ring. On reduction with palladium-charcoal hydrogen the carbonyl group of the side chain attached to the α -carbon is in all cases reduced to CH_2 . Synthetic α acetyltetronic acid contains the same nucleus as the metabolic acids and gives a complete analogy with these acids in respect to the series of reactions described above. The metabolic products are derivatives of γ -methyl and γ carboxymethyl tetronic acids—P. W. CLUTTERBUCK, H. RAISTRICK and F. REUTER, *J. Soc. Chem. Ind.*, 54 (1935), 171 (E. G. V.)

Organic Arsenic Compounds Examples are given of the preparation of compounds having the general formula $HO-CH_2-CO-NH-Ar-X$ where X represents $-AsO_3H$ or $-As=O$. Y stands for H or lower alkyl groups and Ar represents a phenyl group or a phenyl group which has an hydroxy, or a lower alkyl group, or a lower alkoxy or a halogen substituted for one hydrogen. The products are claimed to be nontoxic—K. STREITWOLF, A. FEHRLE and H. OESTERLIN (to Winthrop Chemical Co.) U. S. Pat. 1,988,758, Jan. 22 1935.

Potassium Stannic Pyrocatecholdisulphonate and Other Complex Metal Compounds Complex metal salts of polyhydroxybenzene compounds containing at least two hydroxyl groups in ortho position and at least one acid group capable of forming a salt of an alkali metal, and a metal capable of being oxidized. Various oxidizing agents may be used, e. g. hydrogen peroxide, magnesium peroxide, sodium persulphate etc. The oxidation is generally carried out in solution. The solutions containing the products are evaporated or the new compounds are precipitated by

adding an organic solvent, e g, methyl alcohol. In certain cases the compounds may be oxidized in the solid state. The new compounds are generally colored powders, soluble in water and generally are less toxic than the unoxidized compounds. Several examples with procedures are given — H SCHMIDT (to Winthrop Chemical Co.) U S Pat 1,988,575, Jan 22, 1935

BIOCHEMISTRY

Anterior Pituitary—Clinical Manifestations of Dysfunction of A review of the more important literature relating to laboratory and clinical symptomatology with deficiency or absence of one or another of the several hormones elaborated by the anterior lobe of the pituitary gland — H M EVANS *J Am Med Assoc*, 104 (1935), 464 (M R T)

Anterior Pituitary—General Physiology of A discussion and review of the literature dealing with the physiological role of the several hormones of the anterior pituitary — P E SMITH *J Am Med Assoc*, 104 (1935), 548 (M R T)

Blood Iron—Methods for Determining Comparison of Wet and Dry Ashing Wong's method was changed in so far as the blood mixture with sulphuric acid and persulphate was heated to 80° for 10 minutes. For the dry method, the blood was evaporated on a hot plate, ignited for 8 hours and, after addition of one cc nitric acid dried again. The solution in 6N hydrochloric acid was centrifuged after addition of ammonium hydroxide and the liquid was used for copper determination by McFarlane's method. The precipitate was dissolved in sulphuric acid, oxidized with persulphate and used for colorimetric estimation with potassium thiocyanate. The deviation between both methods is less than 1% — A A FABIAN, A SACHS and V E LEVINE *Proc Soc Exptl Biol Med*, 32 (1935), 662 (A E M)

Calcium Phosphate—Colloidal, of Blood Serum and Calcium Partition in Serum The maximum of protein bound non diffusible calcium in beef serum is 14 mg % with a concentration of 7.2% protein. Colloidal calcium phosphate found in blood serum has the composition of the tertiary salt, and the equilibrium between protein bound and ionized calcium conforms to the mass law — D M GREENBERG, C E LARSON and E V TUFTS *Proc Soc Exptl Biol Med*, 32 (1935) 647 (A E M)

Carotenoids of Butter A number of ordinary and colostrum butter carotenes have now been submitted to a detailed chromatographic analysis with spectroscopic control. Using either alumina or calcium hydroxide as adsorbents it has been found that the pigment can be separated into two fractions having the properties of α - and β -carotene, respectively, the relative amounts of each varying considerably in different samples. β Carotene is commonly present in 2-3 times the amount of α isomeride but in some cases the latter predominates. In addition to these two isomers the yellow pigments of butter, petrol-phasic to 90 per cent methyl alcohol, usually contain minute amounts of other carotenoids, the adsorption properties and spectroscopic criteria of which indicate the presence of kryptoxanthin and lycopene. Thus in addition to vitamin-A, butter contains two, and sometimes three other compounds exhibiting growth-promoting activity — A E GILLAM and I M HEILBRON *J Soc Chem Ind*, 54 (1935), 173 (E G V)

6,7-Dimethyl-9-L-arabo-flavin —Lacto-flavin in N/20 Sodium hydroxide is levorotatory. The specific rotation $[\alpha]_D^{20} = -115^\circ$ is the same of substances found in milk, liver and lucern. Synthetic 6,7 dimethyl 9 L-arabo flavin which is active because of vitamin B₂ content, is also levorotatory. The synthetic tetraacetyl 6,7-dimethyl 9 L-arabo flavin resembles natural tetraacetyl-lacto flavin. Specific rotation is also the same. L Arabinose (synthetic) is dextrorotatory, the levorotatory rotation of flavin is due to the formation of l arabinamins which are little levorotatory. In order to better understand the specific rotation of natural vitamins a study was made of the position of hydroxyl groups on other synthetic sugars such as l arabinose, d-xylose, l xylose and d ribose. H Theorell obtained protein substances from the yellow ferment which are not identical with lacto flavin. By denaturizing the yellow ferment he obtained 1 molecule of phosphoric acid. The activity of lacto flavin in the ferment is due to lacto flavin phosphoric acid and not to lacto flavin alone. Former experiments with animals, proved the presence of vitamins to contain proteins, now the activity seems to be due to phosphoric acid also. Vitamin + Phosphoric Acid + Protein = Ferment. According to H Theorell, the activity of the yellow ferment is due to the replacement of purine with 6,7-dimethyl alloxazin, which makes it (yellow ferment) a nucleotid 6,7-Dimethyl-iso alloxazin = 6,7-dimethyl flavin. There is a great difference between alloxazins and flavins but little difference between synthetic flavins and yellow ferment. The lack

of hydroxyl-groups makes the esterification of 6,7-dimethyl-9n amyl flavin with phosphoric acid impossible, hence its lack of vitamin B₂ activity —R KUHN and F WEYGAND *Ber*, 68 (1935), 166 (G B)

Dimethyl-Flavin—6,7-Dimethyl-Flavin-9-Acetic Acid The synthesis of flavin carboxylic acid is not important with respect to the substance, but is important from a biological standpoint. The carboxyl group attaches itself to the benzene ring through oxidation of lumi lacto flavin with potassium permanganate, it is suspected that the formation of carboxylic acid in the system from vitamin B₂, is produced through the oxidation of the methyl groups in the chain. There is present a carboxylic acid whose group is attached to the 9th position of the chain. 1,2-Dimethyl-4 nitro-5 amino benzol was condensed with acetic acid bromide into 1,2 dimethyl-4 nitro 5 anilin-acetic acid. The reduction to amino acid with alloxan was not very successful. With sodium stannate the reduction is hastened, and 6,7-dimethyl flavin-9-acetic acid obtained. The methyl ester melts at 293°. The free carboxylic acid is soluble in water but not in chloroform. 6,7 Dimethyl flavin 9 acetic acid is susceptible to light in neutral and slight acid solution. In alkali solution it is stable to light. This proves that the carboxylic acid is not a by-product in the photo chemical reaction from lumi lacto flavin to lacto flavin. The water-soluble 6,7-dimethyl flavin-9 acetic acid shows no nourishing effect on rats, deficient in vitamin B₂. The same is true of the glycerin ester. The lacto flavins are active biologically, soluble in water, insoluble in chloroform, the residual tetraoxy-butyl plays an important part in the constitution of vitamins —R KUHN and H RUDY *Ber*, 68 (1935), 300 (G B)

Ergosterol—Attempt to Ketonize Since an earlier investigation had concluded that activation of ergosterol by ultraviolet light is due to a chemical isomerization and because keto enol isomerism is theoretically possible, ergosterol was subjected to a reaction with hydroxylamine under conditions which were known to give an almost quantitative yield in the formation of the oxime of cyclohexanone. Ergosterol was recovered unchanged from the reaction material. Details of experimental work are reported —E MONESS and W G CHRISTIANSEN *J Am Pharm Assoc* 24 (1935), 115 (Z M C)

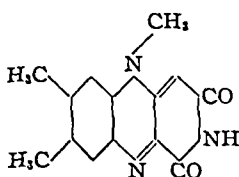
Gonadotropic Factors—Interrelationships among Urinary, Pituitary and Placental A review, with discussion, of available evidence emphasizing similarities and differences among the gonadotropic factors demonstrable in the urine, pituitary and placenta, and the physiological interrelationships made apparent by the existing evidence —J B COLLIP *J Am Med Assoc*, 104 (1935) 556 (M R T)

Gonadotropic Hormones—Hypophyseal A review of published evidence showing that the gonadotropic substance from the hypophysis is composed of two principles, one a gametokinetic (follicle stimulating) hormone the other a "luteinizer" causing luteinization of the ovary and presumably acting also on the interstitial tissue of the testes —P E SMITH *J Am Med Assoc* 104 (1935), 553 (M R T)

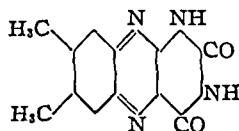
Lacto-flavin (Vitamin B₂)—Isolation of, from Hay Research proved that flavin is a constant component of all green leaves, as is chlorophyll. Its properties are compared to that of a ferment-like substance. Whether it is part of the chloroplasts or chlorophyll or whether it is present in the cell content, or whether it is assimilated during the formation of carbonic acid or during the respiration process, that is unknown, but its presence is there as such. To answer these and other questions the isolation of flavin from green plants was undertaken. It was found that milk and liver were rich in lacto flavin (vitamin B₂), but the fact to be proven was whether the vitamin B₂ reached the liver and mammary glands of animals unchanged or whether it undergoes changes the same as the carotene in plants into vitamin A. Hay meal was chosen because it is used in food for cows and also because cows' milk is rich in vitamin B₂. One hundred and three Kg of hay-meal was boiled with 1480 liters of water and after extraction, 50-70 mg of lacto flavin in the form of tetraacetyl was obtained. The crystals obtained showed the same general structure, optical rotation, absorption spectrum and constructive metabolism properties as the tetraacetyl lacto-flavin found in milk. It was proven also that lacto flavin is a plant coloring material (pigment) and that it passes from the animal through his liver and into its milk undergoing no changes. The increase in the amount of vitamin B₂ in green leaves is possibly due to respiration in plants during the formation of carbonic acid or liberation of carbon dioxide. One Kg of fresh green leaves contains 0.0005 Gm vitamin B₂ and 2.0 Gm chlorophyll. The relation of the coloring material is flavin to chlorophyll = 1:2000. Not much stress is laid on this theory that is, the

increase in amount of vitamin B during the assimilation of carbonic acid—R KUHN and H KALTSCHMITT *Ber*, 68 (1935), 128 (G B)

Lumi-lactoflavin—Natural and Synthetic Synthetic 6,7,9 trimethyl flavin obtained from formic acid in the form of yellow needles, differs from dye products ($C_{13}H_{12}N_4O_2$) of natural origin as follows 1 On hydrolysis, oxy carbonic acid ($C_{12}H_{12}N_2O_3$) formed and not 6,7-dimethyl alloxazin or the compound $C_9H_{10}N_2O_2$ 2 The coloring action of the synthetic material is 7% greater than in the natural products Synthetic 9 methyl, 6, 9 dimethyl and 6,7,9 trimethyl flavin show no melting point but decompose and carbonize at 300° , natural lumino flavin crystals melt at 330° Such deviations depend, in the natural lacto flavin, on the purification over silver salts and recrystallization from acetic acid These preparations are composed of a mixture of methyl-imid free coloring substance (α lumi-lactoflavin) and methyl imid in combination (β -lumi-lactoflavin) Lumi lactoflavin is not a flavin (iso alloxazin) but 6,7-dimethyl alloxazin β -Lumi lactoflavin is identical with 6,7,9 trimethyl flavin Lumino-lactoflavin $C_{13}H_{12}N_4O_2$ was synthesized for the first time in a pure state The separation of a mixture of 6,7,9-trimethyl flavin from 6,7 dimethyl alloxazin is difficult because of close resemblance of their properties



6,7,9-Trimethyl-flavin



6,7-Dimethyl alloxazin

The origin of 6,7-dimethyl-alloxazins in natural lumi-lactoflavin preparation is not clearly understood Further investigation led us to consider the formation of other constituents during the preparation of "whey" from milk—R KUHN, H RUDY and K RENIEMUND *Ber*, 68 (1935), 170 (G B)

Luteal Hormone The author gives a complete review of the literature and discusses the method of Allen for preparing pure crystalline luteal hormone substance He modifies the technique as follows Extract with 70% alcohol, using 3 Kg of alcohol per Kg of tissue The residue is then extracted with 2 portions of absolute alcohol, and the extract is dried *in vacuo* This residue is then extracted with several portions of ether, which after distillation of the ether leaves an oily residue Acetone is then added to precipitate the fatty insoluble materials The liquid is then distilled in vacuum and the oily residue is taken up in methyl alcohol On cooling, most of the oil containing a little active material settles out This residue is extremely difficult to purify The alcoholic solution is diluted with water, then cooled in an ice salt mixture for several hours and then filtered This is repeated until no further precipitation occurs, thus eliminating cholesterol and neutral fats The alcoholic filtrate is mixed with ethyl alcohol, and shaken out with petroleum benzine The luteal substance goes into the petroleum benzine which is removed *in vacuo* The oil is then distilled *in vacuo*, and the fraction obtained between 140 – 160° is richest in hormone After a while, crystals separate The crystals are washed with absolute alcohol and may be recrystallized from ethyl acetate The author believes the product is the same substance as that isolated by Hartmann and Wettstein—D VAN STOLK and M H PENAU *J pharm chim*, 21 (1935), 193 (M M Z)

Pituitary—Separation of Anterior Thyreotropic Hormone of The thyreotropic hormone (I) can be separated from the gonadotropic (II) in the pituitary extracts by precipitating with benzyl alcohol the isoelectric soluble fraction obtained in the isoelectric precipitation at pH 4.2 of crude pyridine extract containing I and II I is precipitated quantitatively When preparations containing I and II were heated, no deleterious effects were observed at $60^\circ C$, at 70° , both I and II were seriously impaired, at 80° , I was completely inactivated and II nearly so, at 100° , both were completely destroyed Excessive doses of placental extract, and urine and blood serum of pregnancy had no effect on the thyroid I in a dosage equivalent to 1 Gm of sheep pituitary powder per week, produced the greatest stimulation of guinea pig thyroid in one week By the end of the third week of treatment, the thyroid had practically returned to normal It was previously re

ported that the thyroid could not maintain a hyperfunctioning capacity in the presence of chronic hyperpituitarism—R O GREEP *Am J Physiol*, 110 (1935), through *Squibb Abstract Bull* 8 (1935) A 307

Pituitary—Chromatophorotropic Principles of Pars Intermedia of A review of the literature with emphasis on the presentation of evidence proving the existence of a specialized pigment influencing hormone, called 'intermedin,' elaborated by the pars intermedia of the pituitary—B ZONDEK *J Am Med Assoc*, 104 (1935), 637 (M R T)

Pituitary—Lactogenic Factor of A review of pertinent literature dealing with the factor, elaborated by the pituitary gland, which is essential to lactogenesis—OSCAR RIDDLE *J Am Med Assoc*, 104 (1935) 636 (M R T)

Plasma Fibrin—New Method of Determining One cc of oxalated plasma is diluted 25 to 30 times with normal saline solution To this 0.3 cc of a 1:5000 dilution of dried tiger snake venom in saline is added The fibrin clot is washed thoroughly on a filter and dried at 37° or 110° S ROSENFELD and A S WIENER *Proc Soc Exptl Biol Med*, 32 (1935) 788 (A E M)

Posterior Pituitary A review of the more important pharmacological and bio chemical literature dealing with the acutely potent hormones existing in the posterior lobe of the pituitary gland—E M K GEILING *J Am Med Assoc* 104 (1935) 738 (M R T)

Thrombin—New Method of Preparation Fresh fibrin from calves was washed free of hemoglobin and extracted with ether The dried material was extracted with 8% sodium chloride solution and the filtered extract dialyzed first against water, then against a Sørensen buffer mixture of pH 7.38, finally again against water The solution was dried with an electric fan The potency of the dry preparation is stable—A C ROBERTS *Proc Soc Exptl Biol Med* 32 (1935) 606 (A E M)

Van Der Bergh Reaction of Bilirubin—Variations in Xanthochromic Cerebrospinal Fluid A prompt reaction is obtained when the concentration of the pigment is above 0.3 mg % and at low protein concentration Increase of proteins or low pigment content produce delayed reactions It is supposed that delayed reactions in blood are brought about by the same conditions—S L VAUGHAN and R S HUBBARD *Proc Soc Exptl Biol Med*, 32 (1935), 618 (A E M)

Vitamin-A Active Substances in Egg Yolk The presence of carotene in egg yolk was confirmed, removing carotene from the total pigments by partition between petroleum ether and 90 per cent methyl alcohol Analysis reveals kryptoxanthin to be associated with the carotene the content of the former was raised to 0.2 mg per 100 Gm of yolk by feeding hens on a rich maize diet—A E GILLAM and I M HEILBRON *J Soc Chem Ind* 54 (1935) 173 (E G V)

Vitamins B—Experimental Investigations on, in Their Relations to Glucides, Proteins and Lipids of Diet After a critical review of recent work on vitamins B, extensive experiments carried out on pigeons are described, and the results discussed *Conclusions* The B group of vitamins comprises 3 distinct vitamins B₁ or antineuritic B or antidermatitic (antipellagrous) and B₂ or antidenutritional which exert complementary and interdependent actions on the animal or organism Absence of vitamins B in presence of glucides, proteins or lipids produced attacks of polyneuritis typical of avitaminosis B, rapidly followed by death, preventive or curative addition of brewers yeast ensured the maintenance or recovery of health in all the birds experimented upon provided the diet itself was properly balanced The specific nature of the glucides, proteins and lipids exert considerable influence on the rate of evolution of total avitaminosis B and also on the dose of vitamins B required to maintain the birds in a satisfactory physiological condition The individual effects of simple compounds can be very considerably attenuated when they are combined in more complex molecules e g levulose in sucrose or inulin, polypeptides bound in natural proteins (and liberated in peptones) The digestibility (rate of intestinal assimilation) of glucides proteins and lipids control to a considerable extent the requirements of vitamins B necessary to ensure utilization of the diet e g, the vitamins B requirements are considerably reduced with diets comprising largely potato starch, beef muscle and cod liver oil while they are especially high with diets based on glucose or sucrose peptones or olive oil With substantially equal digestibility, the vitamins B requirements seem greater in the case of glucides The presence in the diet of large proportions of certain substances (e g galactose lactose castor oil and to some extent muscle peptone) unbalances the diet so that its equilibrium cannot be restored with doses of brewers yeast which are sufficient for a normal diet In rebalancing a diet contain

ing such substances, the addition of lipids or of unpeptonized proteins apparently plays an important part, these lipids and proteins apparently exercising a reserve action toward the vitamins B supplied by the diet or present in the organism —**RAOUL LECOQ** *Bull soc sci hyg aliment*, 22 (1934), 278-331 (A P C)

Vitamin B₁, Crystalline—Studies of II Elementary Composition and Ultraviolet Absorption The authors, after careful analysis of the hydrochloride of vitamin B₁ which had been crystallized several times from 85% alcohol and dried over calcium chloride in partial vacuum at 55°, suggest C₁H₁₆ON₂S 2HCl as the formula. They also found ultraviolet absorption to occur in two bands at 235 mμ and 276 mμ, respectively —**O. WINTERSTEINER, R. WILLIAMS and A. E. RUEHLE** *J Am Chem Soc*, 57 (1935), 517 (E B S)

Vitamin B₁, Crystalline—Studies of Cleavage of Vitamin with Sulphite The vitamin was treated with sodium sulphite solution containing sufficient excess of sulphurous acid to bring the pH to 4.8-5.0 and having a sulphite content of 2.6N. Cleavage was completed at room temperature in twenty four to forty eight hours and at steam bath temperature in one hour or less. A sparingly soluble acidic product having the composition C₆H₅N₂SO₃ and a chloroform soluble base having the composition C₆H₅N₂SO were obtained —**R. R. WILLIAMS, R. E. WATERMAN, J. C. KERESZTESY and E. R. BUCHMAN** *J Am Chem Soc*, 57 (1935), 536 (E B S)

Vitamin B₂—Condition of, in Cows' Milk Fresh cows' milk containing lacto flavin (Vitamin B₂) is about 90% dialyzable. The dialyzing test did not determine whether the coloring material is combined with protein in milk. The test was made to determine whether the vitamin is present in the free state or is esterified with phosphoric acid. The behavior in the electrical field of lacto-flavin and lacto flavin-phosphoric acid was easily told apart. The milky suspension has a pH of 7.2 and travels to the anode, in contrast to the yellow green fluorescent coloring material which does not ionize. To prove this test, skimmed milk, the yellow green fluorescent crystals of which did not ionize, was used. This experiment proved that the coloring material from the "whey" is not identical with the properties of the "yellow ferment," and during the process of isolating vitamin B from milk no phosphoric acid ester of the vitamin was detected. Although lacto flavin, a plant coloring material is, naturally found as such in plants, the name lacto flavin is more properly established because it was crystallized (C₁₇H₁₀N₄O₆) first from milk and also because it is found there free that is, not as an ester —**R. KUHN and H. KALTSCHMITT** *Ber*, 68 (1935), 386 (G B)

Vitamin B₂-Phosphoric Acid—Synthesis of This test was to determine whether, the "yellow ferment," the color component of flavin is in any way connected with phosphoric acid. The color component of the ferment contains a vitamin B which is important in metabolism. The experiment was to prove whether the vitamin B is found in its free dialyzable form, as phosphoric acid ester, or whether there is a difference in metabolism between flavin and phosphoric acid flavin. There is a possibility that synthetic flavin might react in the system to be esterified with phosphoric acid. To answer this and other questions, the problem of lacto-flavin-phosphoric acid has been taken up. From the lacto flavin esters only one tetraacetyl combination is known. Obtaining the phosphoric acid ester was accomplished with the use of phosphoroylchloride in pyridine. After washing with silver and sodium salts the formation of lacto flavin phosphoric acid crystal aggregates separated out. The correct position of phosphoric acid in the structural formula is unknown, but its molecular formula is C₁₇H₁₂N₄PO₆. The phosphoric acid ester of lacto flavin is the same in color and fluorescence as that of lacto flavin, the pH (7.17) of the synthetic vitamin B₂ phosphoric acid is the same as that of the "yellow ferment" but differs from that of lacto flavin whose pH ranges from pH 3 to pH 9 —**R. KUHN and H. RUDY** *Ber*, 68 (1935), 383 (G B)

Vitamin D—Transformation of Highly Potent Physiological Products with Ultraviolet Rays Irradiation of the known ester of *m* dinitrobenzoic acid or its derivatives converts the mixed ester to the ester which is physiologically active. It separates out in crystalline form, which can be purified through recrystallization, saponified and the active principle isolated from the saponifiable mixture through extractions. Vitamin D in heptane is first irradiated with magnesium light, dried, dissolved in pyridine, and esterified with dinitrobenzoylchloride. It is washed with water acidified with hydrochloric acid then with sodium carbonate solution and finally collected in iced sodium chloride. The ester crystallizes out, and is purified by recrystallization from acetone. After saponifying it with methyl alcohol and potassium hydroxide, an organic substance,

$C_{25}H_{44}O$, is obtained —O LINSERT D R P 603088 K1 12 p from 6/11/1932 rendered 22/9/1934, through *Chem Zentr*, 106 (1935), 110 (G B)

ANALYTICAL

Acimo—Analysis of Acimo consists of 55 Gm of a powder containing magnesium carbonate 25 Gm, bismuth carbonate 1 Gm and sodium bicarbonate 14 Gm. The author describes methods of analysis. Sodium is determined by igniting 2 Gm of the powder for 30 minutes, cooling in a calcium oxide desiccator, taking up in CO_2 free water, filtering, adding 4 cc of dilute H_2SO_4 to the filtrate, evaporating to dryness, igniting and weighing the sodium as sodium sulphate. 142 mg of sodium sulphate is equivalent to 168 mg of sodium bicarbonate. Bismuth is determined by dissolving the water-insoluble residue obtained in the sodium determination in dilute HCl and precipitating with H_2S after which the precipitate is filtered off on an ashless filter paper, ashed, and after cooling treated with HNO_3 , heated and again treated with HNO_3 and finally heated to red heat, the bismuth being weighed as Bi_2O_3 . 42.5–45 mg of Bi_2O_3 represents 50 mg of bismuth carbonate. Magnesium is determined by boiling the filtrate from the bismuth determination until all the H S has evolved. The precipitated sulphur is filtered out and the magnesium is precipitated with sodium phosphate, the resulting magnesium pyrophosphate being ignited and weighed. 1.3815–1.485 Gm magnesium pyrophosphate is equivalent to 1.250 Gm magnesium carbonate. Purity requirements are given as follows. The powder must be free from chloride, sulphate and arsenic, and 2 cc of a 500 mg solution in 10 cc dilute H_2SO_4 must give no stronger nitrate reaction than that of 2 cc of a solution of 3.26 mg of KNO_3 in 1 liter. The analysis of "Bismuthated Magnesium" may be carried out in the same way —H J VAN GIFFEN *Pharm Weekblad*, 72 (1935), 189 (E H W)

Adhesive Plasters—Lesions Produced by and Method of Determining Adhesive Power Constituents of adhesive plasters, which may cause skin affections, are rosin, turpentine, lead and sulphur chloride. When piece of plaster is applied to a test object, it must resist separation there from evenly throughout the entire adhesive surface but the plaster mixture must not separate from its ribbon base on either side. The adhesive power can be estimated by pressing a 50-cm square piece vertically against a smooth surface (glass) and placing a weight at the upper end sufficient to pull it slowly off. The time required and the weight used give a means for comparison. Resistance against traction is estimated by sticking a 5-cm square piece against a smooth surface and determining the weight which will pull it off when applied to the lower end —FRANCISCO N COSENTINO *Semana med*, Buenos Aires, 42 (1935), 688 (A E M)

Bromides—Determination of Small Quantities of, in Sodium Chloride The reagents used are an aqueous Cl solution (about 0.24 mg Cl per cc) and a 0.2% solution of fuchsine (pararosaniline hydrochloride) in H_2O . Determine the number of drops of Cl water required to decolorize one drop of the fuchsine solution in 10 cc H_2O . This should require 6–8 drops. Dissolve 3 Gm NaCl in 10 cc H_2O , add 10 cc H_2O containing a drop of fuchsine solution and add twice the number of drops of Cl water, as determined before. A violet-blue color indicates the presence of Br. Large quantities cause a violet precipitate. The reaction is sensitive to 0.1 mg KBr —R CASARES LÓPEZ *La Farm Mod*, 46 (1935), 55 (A E M)

Calcium Glycerophosphate—Analysis of The different forms of calcium glycerophosphate are shown and methods of analysis are reviewed. The results obtained on analysis of three commercial samples are given —E DELVAUX *J pharm Belg*, 17 (1935) 167, 183 (S W G)

Calcium Hypochlorite—Value of, as Volumetric Oxidizing Agent—Stability and Standardization of Solution of Determination of Ammonia Solutions of hypochlorite have found little application in volumetric analysis since in general they are unstable. It was found that Matheson Alkali Works' "H T H" calcium hypochlorite yielded solutions which were quite stable. By adding an excess of bromide to the sample to be titrated the hypochlorite behaves as hypobromite. The solution may be standardized against arsenic trioxide using Bordeaux as indicator, in acid or weakly alkaline solution. For the determination of ammonia (from 0.5 to 20 mg) the mixture is allowed to stand 3 to 5 minutes with a slight excess of hypochlorite then treated with potassium iodide and acid and back-titrated with standard thiosulphate —I M KOLTHOFF and V A STENGER *Ind Eng Chem, Anal Ed*, 7 (1935) 79 (E G V)

Chlorate Ion—Rapid Test for Qualitative and Approximately Quantitative Test Especially Suitable for Work with Plant Extracts A method has been devised for the detection of small

amounts of chlorate which is especially suitable for work with plant extracts. Ammonium thiocyanate in test paper is oxidized by the chlorate compound with the production of yellow oxidation products of thiocyanic acid. The yellow coloration can be made roughly quantitative as well as qualitative by comparing the color of the unknown against the color of standard test papers. Under the conditions of the test the oxidation products consist largely of canarine and pseudothiocyanic acid, with small amounts of hydropseudothiocyanic acid and isoperthiocyanic acid. The sensitivity of the test and the influence of other constituents on the accuracy of the method are also discussed. Halogens, bromate and iodate, hypohalites, persulphates, peroxides and cupric salts give somewhat the same coloration of the thiocyanate test paper as the chlorates—H R ORFORD *Ind Eng Chem, Anal Ed*, 7 (1935), 93 (E G V)

Cholesterol—Quantitative Determination of Free, and as Ester without the Use of Digitonin One cc of serum is extracted with alcohol ether by Bloor's method, dried and dissolved in anhydrous chloroform. Two standards are prepared one with cholesterol oleate equivalent to 1.6 mg cholesterol, the other with 1.6 Gm free cholesterol in 10 cc chloroform. One cc of a mixture of 25 volumes of sulphuric acid with 1000 acetic acid cooled to 0° is added. Colorimetric reading is made after 50 minutes standing at 0–2°. The solutions are compared with a 0.0025% solution of naphthyl green B. The color corresponds to the esters, while the free cholesterol gives only a very faint color which must be considered in the calculation of results. After keeping the solutions for 40 minutes at 38°, a second reading is obtained corresponding to the total cholesterol—J G REINHOLD *Proc Soc Exptl Biol Med*, 32 (1935), 614 (A E M)

Cinchona Bark Preparations—Production and Tests of A comparative critical investigation of the useful methods for determining the alkaloid content of the cinchona preparations described in dispensaries and pharmacopœias. The report discusses the determination of alkaloids of the bark of *Cinchona succirubra* with particular reference to the fineness of the powder used for extraction and the moisture content of the powder. The uses of the individual cinchona preparations and their alkaloids are also considered. For details, the original article must be consulted—K MATOLCSI *Magyar Gyógyszeresztudományi Társaság Értesítője* 10 (1934), 488–524, through *Chem Zentr*, 106 (1935), 595 (G B)

Citric Ointment—Assay of Following a brief historical introduction, the composition of the ointment is discussed. It is essentially mercuric nitrate solution mixed with elaidin containing basic oxides of mercury, mercuric oleate, palmitate, stearate and elaidate. In the experimental work, most of the suggested methods for ointments of mercury compounds were rejected because of their complexity and the time required. Strickland's method which treats the ointment with nitric acid and titrates the mercuric nitrate solution with potassium thiocyanate was tried. Results were low and variable, probably because the long time required to break down organic matter in the ointment permitted volatilization of mercury. A stronger oxidizing mixture seemed necessary and perchloric acid (Sp Gr 1.615), 1 part, fuming nitric acid (Sp Gr 1.49), 2 parts, and distilled water 2 parts was found satisfactory. The following method was developed: "Place about 5 Gm of the ointment, accurately weighed, in a flask containing 50 cc of the above acid mixture and reflux until a clear solution is obtained and the brown fumes are no longer distinguishable. Dilute the solution with about 20 cc of distilled water and pass it through a filter paper into a 100-cc volumetric flask. Wash the funnel with sufficient distilled water to bring the volume up to 100 cc. Take a 20 cc aliquot of this solution, titrating it with N/10 potassium thiocyanate solution, using ferric alum as the indicator, until a permanent reddish brown color is obtained. The condenser and flask used should be fitted with ground glass connections in order to avoid contamination and error which might occur from the action of the acid mixture upon either cork or rubber stoppers." Details of experimental work are reported and results are tabulated—T G WRIGHT *J Am Pharm Assoc*, 24 (1935), 102 (Z M C)

Coffees, Decaffeinated—Caffeine Content and Value of, in Nutrition The method used by G and L for the determination of small amounts of caffeine in decaffeinated coffee involved the following procedure. 25 Gm of finely ground coffee are placed in a flask and moistened with 20 cc dilute ammonium hydroxide (1 + 3) and then shaken intermittently for one hour. The product is then extracted with 300 cc of ethyl acetate (100-, 100-, 50- and 50 cc portions). The solvent is distilled off *in vacuo* over a water-bath. To the residue 5 cc of 5% sulphuric acid are added and mixed for ten minutes, finally 40 cc of distilled water are added and the solution is

raised slowly to boiling. One gram of paraffin is added and the mixture filtered. The filtrate is alkalinized with ammonium hydroxide and then 20 cc of potassium permanganate (1:10) are added. The excess potassium permanganate is taken up by hydrogen peroxide. The resulting mixture is heated for 15 minutes on a water bath, filtered and the precipitate is washed. The filtrate is extracted with four 20 cc portions of chloroform. This extract, after the removal of the chloroform, yields silky crystals of caffeine. Analysis of four samples met the requirements of the food and drug decree of the French authorities and the other was slightly overstrength—A. GUILLAUME and C. LEFRANC *Bull sci pharmacol*, 42 (1935), 14 (C T I)

Copaiba Balsam—Examination of Several samples of copaiba balsam of known purity and one of gurgun balsam were subjected to the tests prescribed in the various pharmacopœias. Van Itallie and Nieuwland's color reaction is not specific, the ammonia reaction for detecting fixed oils is inapplicable to mixtures of copaiba and gurgun. Vodge, Alcott and Turner's reaction for gurgun (blue coloration on pouring over sulphuric acid a solution in glacial acetic acid containing sodium nitrite) is fairly characteristic, it seems to depend on the presence of large quantities of cadinene which is also present but only in traces, in copaiba, in doubtful cases the test should be repeated and compared with the color obtained on a copaiba of known purity to which 1% gurgun is added. The samples examined had a specific gravity ranging from 0.958 to 0.990, the non-volatile residue varied within wide limits, but was always greater than 45%. The acid number varied from 62 to 92.5, the saponification number from 66 to 96, and the Wolff precipitation number (addition of water to an alcoholic solution of balsam) varied from 12 to 14 for copaiba and from 3 to 4 for gurgun. The essential oil separated on steam distillation of the balsam had an optical rotation of from -7.50° to -37.75° for copaiba and of -69.30° for gurgun—J. W. BIRZA *Aan P van der Waelen* (1934), 76-90, through *Chimie & Industrie*, 33 (1935) 423 (A P C)

Copper—Determination of, in Organic Matter Ansbacher's method, with some modifications, was used for determining copper in organic matter previously ashed. Instead of placing the crucible containing the copper sulphide in a glass triangle over a crystallizing dish, it is placed in a 50 cc Erlenmeyer flask the top of which has been cut off so that the crucible will fit into it to a depth of about 1.25 cm. A lip is also made in one side of the flask for pouring and rinsing out the copper nitrate and sulphate solution. The use of the Erlenmeyer flask decreases the danger from copper contamination and loss of the sample due to the crucible tipping over. To dissolve the copper sulphide and evaporate the copper nitrate and sulphate solution the Erlenmeyer flask is placed on an aluminum water-bath which rests on an electric hot plate having aluminum top and sides. The hot plate is placed in a metal free hood lined with asbestos sheet rock. Evaporation to dryness can usually be completed on the water bath, but it may be necessary to place the flask directly on the hot plate for a few minutes. It is also desirable as Ansbacher suggests, to have a glass plate over the crucible and flask to exclude copper contamination—O. SHEETS, R. W. PEARSON and M. GEIGER *Ind Eng Chem, Anal Ed*, 7 (1935) 109 (E G V)

Cyanide—Separation and Detection of The apparatus consists of two 15 x 180 mm test tubes and a 100 cc Erlenmeyer flask connected by rubber and glass tubing. Two tenths Gm of the substance to be analyzed for cyanide (or 3 cc of a prepared solution, made by treating 3 Gm of the substance with 50 cc of 1.5M sodium carbonate boiling for 3 minutes, and filtering) is introduced into the flask. The first test-tube contains 6 cc of 3M hydrochloric acid and the second 10 cc of 6M sodium hydroxide. A plug of absorbent cotton in the neck of the flask prevents any of the liquid from being carried over into the alkali. By slowly turning on the compressed air the acid in the first test-tube is forced over into the flask. A slow stream of air is then allowed to bubble through the flask for 30 minutes. Any cyanide in the mixture is thus carried over into the second test-tube, where it is absorbed by the alkali. It is detected in this solution by means of the Prussian blue reaction carried out as follows. To the alkaline solution are added a few drops of a freshly prepared 1M ferrous sulphate solution the mixture is heated almost to boiling and then thoroughly cooled. The solution is then carefully neutralized with 12M hydrochloric acid and a few drops of 1M ferric chloride solution are added. The formation of a blue precipitate or with very small amounts of cyanide of a blue or blue green coloration indicates the presence of cyanide—L. J. CURTMAN and S. M. EDMONDS *Ind Eng Chem, Anal Ed*, 7 (1935) 121 (E G V)

Essential Oils—Estimation of Alcohols in A report given by S. Sabatay at L. Academie

des Sciences in which he detailed a method of determining the content of primary and secondary alcohols, which reduces the time of estimation considerably, with results approximating very closely to those obtained by the process usually employed. This latter consists in acetylation with acetic anhydride by heating for two hours on a sand bath in the presence of anhydrous sodium acetate. With the readily dehydratable tertiary alcohols, satisfactory results are only reached by formulation in the cold by means of a mixed aceto formic anhydride—an operation taking at least three days on account of the slow esterification of these alcohols. In the preparation of acetates of tertiary alcohols the catalytic action of phosphoric acid has been used for the acetylation in the cold by means of acetic anhydride. To prepare the catalyzer 10 Gm of orthophosphoric acid are mixed with 90 Gm of acetic anhydride. The catalyzer keeps well in spite of the yellowish tint it develops after some time. Seven to 10 cc of the essential oil for analysis are dissolved in 14 to 20 cc of acetic anhydride, then 1 to 1.5 cc of the catalyzer is added, it is only necessary to cool the container if the temperature due to the disengagement of heat should rise above 50° C. The mixture is left for 15 minutes, then 50 cc of distilled water are added and the whole is heated over a water bath for ten minutes, boiling and shaking frequently. It is now decanted and washed successively with 25 cc of saturated brine, 25 cc of brine containing 1 per cent of potassium carbonate, 25 cc of brine and 15 cc of water, in the case of cetyl alcohol only three washings with 50 cc of hot water are necessary. It is then dried over sodium sulphate and hydrolyzed for an hour on the water bath by alcoholic seminormal caustic potash. Two hydrolyses are made and the mean taken. A table showing the results obtained by the rapid acetylation compared with those by the ordinary method is given—*Perf and Ess Oil Rec*, 26 (1935), 44 (A C DeD)

Identification Numbers of Drugs and Galenicals—V **Copper Numbers of Drugs Used Most** The reducing power (Copper Number) of 37 vegetable drugs in various forms using Fehling's solution are reported. Other data included in an elaborate table for these drugs are (1) % moisture, (2) ash content of air dried and water free drugs, (3) Copper numbers of air dried and water free drugs, (4) Inversion Copper numbers of the air-dried and water-free drugs and (5) Copper Number Quotients $\frac{\text{Cu No In}}{\text{Cu No}}$ —J A MULLER *Apoth Ztg*, 50 (1935), 93 (H M B)

Indophenine Reaction—Use of, for the Identification of Some Organic Polyacids Many acids form thiophene derivatives when heated with phosphorous trisulphide and consequently give the indophenine reaction. A small quantity of the acid is neutralized with Na CO₃, evaporated to dryness and mixed with phosphorous trisulphide. A drop of a solution of isatine in H₂SO₄ is added and the mixture is heated until vapors develop. A blue color is developed, when the reaction is positive. The latter is sensitive to 25% with succinic acid, 25 with fumaric acid, 50 with maleic and malic acid, 100 with pyrotartaric acid and 250% with tartaric and citric acid. The presence of glutaric, suberic, azelaic and sebacic acid disturbs the reaction. The addition of some drops of a 2.5% solution of lead acetate permits the performance by the method described, though the reaction is less sensitive. All acids which give the reaction can be destroyed with KMnO₄ with exception of pyrotartaric and succinic acid. This permits the investigation of the latter in mixtures —José VÁZQUEZ SÁNCHEZ *La Farm Mod* 46 (1935) 58 (A E M)

Lactic Ferments—Determination of Biologic Value of The following method is given. Inoculate aseptically 500 cc of sterile milk with an average sample of the product, or 4 ampuls or 6 Gm in the case of tablets or powder. Determine the acidity of 10 cc of the mixture at the beginning, using 0.1N sodium hydroxide and 10 drops of 1% phenolphthalein. Incubate at 37° C. Note the rapidity of coagulation and the kind of curds formed. Determine the acidity after 6 hours of incubation. A table for comparison is given. The product should not give an appreciable reaction for catalase —M VAN HAUWAERT *J pharm Belg* 17 (1935), 151 (S W G)

Lacto-flavins—Optical Activity of In neutral solution lacto flavin is optically inactive. In alkaline solution it is levorotatory. In order to compare it with stereoisomers of synthetic flavins C₁₇H₉N₄O₆ it is important to know its optical activity under different conditions

$$\begin{aligned} [\alpha]_D^{20} &= \pm 3^\circ (2N \text{ H}_2\text{SO}_4) \\ [\alpha]_D^{20} &= \pm 5^\circ (\text{H}_2\text{O } N/100 \text{ NaCl}) \end{aligned}$$

$$\begin{aligned}
 [\alpha]_{\text{D}}^{20} &= -114^{\circ} \text{ (N/75 NaOH)} \\
 [\alpha]_{\text{C D}}^{20} &= -70.5^{\circ} \text{ (N/75 NaOH)} \\
 [\alpha]_{\text{D}}^{20} &= -115^{\circ} \text{ (N/10 NaOH)} \\
 [\alpha]_{\text{C D}}^{20} &= -60^{\circ} \text{ (N/10 NaOH)} \\
 [\alpha]_{\text{D}}^{20} &= -110.5^{\circ} \text{ (N/5 NaOH)} \\
 [\alpha]_{\text{C D}}^{20} &= -60^{\circ} \text{ (N/5 NaOH)} \\
 [\alpha]_{\text{D}}^{20} &= -78^{\circ} \text{ (1 4/N NaOH)} \\
 [\alpha]_{\text{C D}}^{20} &= -34^{\circ} \text{ (1 4/N NaOH)} \\
 [\alpha]_{\text{D}}^{20} &= -123.5^{\circ} \text{ (Molybdic Acid)} \\
 [\alpha]_{\text{C D}}^{20} &= -71^{\circ} \text{ (Molybdic Acid)} \\
 [\alpha]_{\text{D}}^{20} &= +350^{\circ} \text{ (Borax)} \\
 [\alpha]_{\text{C D}}^{20} &= +219.5^{\circ} \text{ (Borax)} \\
 [\alpha]_{\text{D}}^{20} &= -59^{\circ} \text{ (Glacial Acetic Acid)} \\
 [\alpha]_{\text{C D}}^{20} &= -370^{\circ} \text{ (Glacial Acetic Acid)}
 \end{aligned}$$

The yellow [sodium] light optical activity is twice as great as that of the red (cadmium) light. There is a connection between the optical activity and light sensitiveness of lacto flavin in alkaline solution.—R. KUHN and H. RUDY *Ber.*, 68 (1935), 169 (G B)

Magnesium Carbonate—Analysis of Eight samples of magnesium carbonate showed a magnesium oxide content varying from 41.8% to 48.5%. If we assume that $\text{MgHC}_6\text{H}_5\text{O}_7$ and $\text{K}_2\text{HC}_6\text{H}_5\text{O}_7$ or $\text{Na}_2\text{HC}_6\text{H}_5\text{O}_7$ are desired in the finished solution of magnesium citrate, the U S P X formula has insufficient citric acid. The formula should probably be flexible and provide for varying amounts of magnesium oxide in the carbonate used. Precipitation logically takes place more rapidly and in greater quantity if a carbonate high in oxide is used. A more uniform product from standpoint of chemical composition and physiological action could be obtained by use of a flexible formula.—H. R. BOWERS *J. Am. Pharm. Assoc.*, 24 (1935), 128 (Z M C)

Medical Products—Tollens' Reaction in Analysis of Tollens' reagent (Ammoniacal AgNO_3) gives reaction with a large number of reducing substances. Non-reducing admixtures usually do not interfere with the reduction of the reagent to metallic Ag. The determination of guaiacol in presence of terpinol and iodoform was studied. One molecule guaiacol corresponds to 2 atoms of metallic Ag. The assay should be performed with about 0.05 g guaiacol. It gives rather accurate results (4% error).—R. SAN MARTIN CASAMADA *La Farm. Mod.*, 46 (1935), 89 (A E M)

Monosaccharides—Microchemical Detection of Relatively large quantities of material are required for the characterization of monosaccharides. The sugar to be studied is placed with the reagent upon a microscope slide or in a glass capillary. After reaction is complete, the resulting crystals of hydrazone or osazone are covered on a slide with a cover slip and washed under observation with a microscope. Recrystallization, in most cases, is superfluous. The melting point is determined after drying for 3 minutes. Micromelting points so determined are in agreement with the reported macromelting points. The identification of a sugar requires an average of about 1 mg of sugar and may be finished in about 1/2 hour. The same reagents are used as by macromethods.—P. FISCHER and W. PAULUS *Arch. Pharm.*, 273 (1935), 83 (L L M)

Morphine—Colorimetric Microdetermination of, in Opium, Its Preparations and in Morphine Syrup. The reagent is a solution of 140 Gm anhydrous sodium carbonate, 20 Gm disodium phosphate and 70 Gm molybdic acid in 500 cc water which is brought to one liter by the addition of 200 cc nitric acid and water. If a morphine solution is to be tested, 10 cc is mixed with one cc of the reagent and a drop of nitric acid, after 10 minutes, 20 drops of ammonia water is added. A blue color develops which is in proportion to the morphine content and suitable for colorimetric comparison with a standard. Morphine hydrochloride syrup can be tested without extracting the morphine. Opium and its preparations are extracted with a calcium hydroxide solution. The solution is acidified, alkalinized with ammonia and extracted with a mixture of 8 parts chloroform and 2 parts secondary propyl alcohol. The mixture is evaporated and the residue is dissolved in hydrochloric acid. The solution is ready for the test.—J. A. SANCHEZ *Semana medica* (Buenos Aires), 42, 1 (1935), 191 (A E M)

Morphine—New Method for Determination of, Especially in Opium. The method depends upon the conversion of the alkaloid to a readily crystallizable derivative by means of 2,4-dinitro-

chlorobenzene Two methods are described, the one cumbersome but affording a high degree of precision, the second simplified yet sufficiently accurate for the requirements of most pharmaceutical laboratories The latter follows 4.50 Gm of finely divided opium are triturated with 1.5 Gm of calcium hydroxide and 10 cc of water Thirty-five cc of water are added, the mixture is agitated vigorously for $\frac{1}{2}$ hour and then transferred to a dry folded filter paper To 26 Gm of filtrate (= 2.50 Gm opium), placed in a 100 cc Erlenmeyer flask are added 38 Gm methanol, then 7 Gm of alkaline potassium oxalate solution containing in 100 Gm 18.4 Gm of neutral potassium oxalate ($C_2O_4K_2 + H_2O$) and 10 cc of normal potassium hydroxide The mixture is heated on a water-bath for $\frac{1}{4}$ hour and then is allowed to cool Fifty-six Gm of filtrate (= 2.00 Gm of opium), obtained by filtering through a covered 8 cm filter paper, are mixed with a solution of 0.6 Gm of dinitro chlorobenzene in 10 Gm of methanol and 10 Gm of water are added The clear solution is set aside over night for crystallization The precipitate is then collected on a pledget in a 5-cm funnel, adhering mother liquor is removed with gentle suction and by washing with 5 cc of methanol, followed by 5–10 cc of water until the filtrate is neutral to litmus The precipitate is washed with the pledget into a wide mouthed, 100 cc Erlenmeyer flask, 10 cc of 0.1N hydrochloric acid is added and the mixture warmed on a water-bath until solution is effected To the cooled solution are added 5 Gm of sodium chloride, 3 drops of methyl red solution and sufficient water to bring the total volume to 50 cc The excess acid is titrated with 0.1N potassium hydroxide 0.11 is added to the required number of cc of 0.1N acid to correct for the amount of morphine derivative remaining in solution The total number of cc of 0.1N hydrochloric acid required multiplied by 0.02852 gives the amount of morphine in 2 Gm of opium Methods are described also for the determination of morphine in simple solution, in mixed opium alkaloids, in Pantopon and in opium concentrates The preparation and physical constants of morphine-2,4-dinitrophenyl ether are given —C MANNICH *Arch Pharm*, 273 (1935), 97

(L L M)

Narcotics—Detection of, in Sense of Opium Law According to the law the following are listed Cocaine, ecgonine and its esters, morphine, diacetylmorphine (heroin), benzylmorphine (peronine), dihydroxycodone (Diconid), dihydromorphinon (Dilaudid), dihydrocodemon (Euclidal), dihydromorphine (Paramorfan), acetyldihydrocodemon (acetyldimethyl dihydrothebaine, Acedicon) thebaine, codeine, ethylmorphine (Dionin), also genomorphine and morphinaminoxide, which are of little importance in Germany Others of importance are Narcophin, Holopon, Laudanon and Pantapon These substances may be divided into groups as a basis for their analytical separation (1) Morphine and related bases and (2) Cocaine, its related bases and substitutes If a small amount of the substance in question on a slide is dissolved in water and yields much precipitate with Mayer's reagent or with potassium iodide iodine solution, the substance belongs to the two groups mentioned above If only a little precipitate or a slight reaction occurs, this is due probably to adulterants or to preparations containing the above substances and in such cases the bases must be separated by the Stas Otto process If a strong reaction occurs with the above reagents, test a small amount of the substance with Marquis reagent using a small shallow porcelain dish or slide placed on a piece of white paper in order to observe color changes better If no color arises, the 2nd group is present, group 1 produces a strong coloration immediately or in a few seconds The groups designated may be further separated by the scheme outlined —GRIEBEL *Apoth Ztg*, 50 (1935), 15

(H M B)

Nylander Test—Simple and Rapid Procedure for The author found that since bismuth subnitrate is soluble in 50% sodium hydroxide solution, the potassium and sodium tartrate becomes superfluous Such a solution of bismuth oxide in alkali will give a quick, fairly sensitive test for sugar in the urine A few drops are heated with a drop of urine in a watch glass or test-tube The sensitivity is easily 0.1% which is satisfactory for practical use —K SCHERINGA *Pharm Weekblad*, 72 (1925), 194

(E H W)

Phosphorus Determinations—Rapid Method of Preparing Biological Materials for In making phosphorus determinations on biological materials, the addition of perchloric acid during the sulphuric-nitric acid method of digestion decreases the time required for the digestion from hours to about 15 minutes A water clear solution is obtained The method of digestion results in no loss and the phosphorus may be accurately determined on the solution volumetrically, gravimetrically or colorimetrically without interference —H W GERRITZ *Ind Eng Chem, Anal Ed*, 7 (1935), 116

(E G V)

Potassium Permanganate—Employment of Potassium Ferrocyanide in Standardization of Dilute To each cc of 0.01N potassium ferrocyanide add 2 cc of N sulphuric acid and titrate with 0.01N potassium permanganate in the presence of 0.05 cc of 0.1 per cent aqueous erioglaucine. Subtract an end-point correction of 0.012 cc from the titer for the erioglaucine.—E J DE BEER and A M HJORT *Ind Eng Chem, Anal Ed*, 7 (1935), 120 (E G V)

Pyrethrum Products—New Method of Analysis of An investigation of the composition of the ether extract of pyrethrum revealed the presence of the following free acids: Mono and di carboxylic chrysanthemic acids, a resin acid having a neutralization no of 300, protocathechuic acid, iso-valerianic, caproic, lauric, palmitic, oleic, linoleic and linolic (the fatty acids in very small amounts only), all these acids, except the phenol carboxylic acids, are also present in the combined state, together with traces of acids very difficult to identify and which will be further investigated. The interference of free and fatty acids on present methods of determining pyrethrins is discussed at length, and a method which is based on the solubility in water of the barium salts of chrysanthemic acids, which overcomes the above noted drawbacks and which is applicable to all products containing pyrethrum, is described in detail. It is essentially as follows: Saponify the pyrethrum extract with normal alcoholic potash, evaporate the alcohol under reduced pressure on the water bath, take up the residue in distilled water, saturate with sodium chloride, add barium chloride, filter, acidify the filtrate with hydrochloric acid, extract the liberated chrysanthemic acids with ether, wash with sodium chloride solution, evaporate the ether, take up in a little alcohol and titrate total chrysanthemic acids with N/5 alcoholic caustic potash, acidify the titrated solution with excess normal sulphuric acid, steam distil and determine monocarboxylic chrysanthemic acid in the distillate by standard methods, the dicarboxylic acid is obtained by difference. The method was applied to the analysis of pyrethrum flowers cut at various stages of development and showed that the pyrethrins contents varied very considerably at different stages, so that in accurate investigations the exact stage of development of the flowers must be specified. The pyrethrin I and II contents are substantially equal. The presence of methyl pyrethrolone was confirmed.—J RIPERT *Ann fals*, 27 (1934), 580-595, 28 (1935), 27-38 (A P C)

Rotenone—Determination of, in Derris Root and Resin The carbon tetrachloride method for determining rotenone has been examined. The method gives low results if the rotenone content of the resin is below 17 per cent, and is seriously in error if the rotenone content is below 10 per cent. The rotenone carbon tetrachloride crystals are probably only 80 to 90 per cent pure.—R S CAHN and J J BOAM *J Soc Chem Ind*, 54 (1935), 37T (E G V)

Sulphur—Determination of Small Amounts of, in Certain Organic Compounds The authors of this paper have worked out a method in which they use an apparatus for spraying a jet of the substance mixed with air and carrying the spray into a specially designed combustion tube. Numerous examples of analyses are given and the results seem to be very satisfactory and the elaborate apparatus employed is well illustrated. The original article should, however, be consulted for details.—N STRAFFORD and H CROSSLEY *Analyst* 60 (1935), 163-169 (A H C)

Sulphur—Oxidation of, in Organic Chemistry—Application to Determination of A study was made of the action of various oxidizing agents on sulphur compounds such as mercaptans, disulphides, thio-ureas, thiocyanates, thiophenes, sulphoxides, sulphones, sulphonic acids and sulphamids. Results indicate that sulphur in the organic molecule can be satisfactorily determined in this manner. The procedure is as follows: A known weight of the substance to be analyzed (about 0.5 Gm.) 20 cc of sodium hydroxide solution and 50 cc of distilled water are introduced into a 1 liter flask. The mixture is cooled and 25 cc of 4% alkaline potassium permanganate is introduced. The mixture is agitated from time to time during one half hour, and then heated (if organic compound is volatile, heating must be very gentle). The heating is maintained for one hour during which time small quantities of permanganate solution are added until a red color persists. The mixture is then cooled and excess hydrochloric acid is added. The excess chlorine is then expelled by heating. After washing down the apparatus with a little water, barium chloride solution (10%) is added until no further precipitation occurs. The precipitate is dried and weighed and the amount of sulphur calculated. Sodium hypobromite also gave very consistent results and a modification of the technique employed in using this oxidizing agent is given. Results are tabulated.—C LEFEVRE and M RANGIER *J pharm chim* 21 (1935) 151 (M M Z)

PHARMACEUTICAL ABSTRACTS

EDITOR A G DuMitz, 32 S Greene Street, Baltimore, Maryland

ABSTRACTORS

WILLIAM B BAFFR
JOHN C BAUER
GERSTON BRUCH
ARTHUR H BRYAN
HENRY M BURLACE
ALBERT H CLARK
ZADA M COOPER
GUSTAV E CVALINA
AMELIA DeDONNICIS
MELVIN F W DUNKER
PERRY A FOOT
RALPH R FORAN
SAMUEL W GOLDSTEIN
H B HAAG
WILLIAM H HUNT
CASIMER T ICHNIOWSKI

ROLAND E KREMERS
CLIFFORD S LLONARD
L LAVAN MANCHEY
ARTHUR E MEYER
A PAPINI AU COUTURE
HARRY ROSEN
A S SCHWARTZMAN
EMANUEL V SHULMAN
EDGAR B STARKY
MARVIN R THOMPSON
E G VANDLN BOSCHE
GIRNN S WHITE
ANNA E WHITE
ELMER H WIRTH
THOMAS G WRIGHT
MAX M ZERFVITZ

CONTENTS

Pharmacognosy	
Vegetable Drugs	70
Animal Drugs	71
Pharmacy	
Galenical	71
Pharmacopœias and Formularies	73
Non Official Formulæ	74
Dispensing	78
Pharmaceutical History	79
Pharmaceutical Education	80
Pharmaceutical Legislation	81
Miscellaneous	81
Pharmacology, Toxicology and Therapeutics	
Pharmacology	82
Toxicology	88
Therapeutics	90
New Remedies	
Synthetics	92
Specialties	93
Bacteriology	96
Chemistry	
General and Physical	98
Organic	
Alkaloids	99
Essential Oils and Related Products	102

PHARMACOGNOSY

VEGETABLE DRUGS

Angostura Bark. The botanical history and the chemistry of the plant are reviewed comprehensively—K MEYER *Pharm Ztg*, 80 (1935) 120 (G E C)

Cloves—Sources of Propagation of the clove tree and the collection and marketing of cloves are described—GERT KELLER *Drug and Cos Ind*, 36 (1935), 281–284 (H M B)

Compositæ Flowers—Pharmacognostic Study of The article consists of a table containing the anatomical characteristics of the first three classes of Tubulifloræ, namely Vernoniæ, Eupatoriæ and Astereæ The table includes a description of the cell wall cuticle epidermal cells, stomata, mesophyll and epidermal hairs The species included are Pacouquina, Lampra chænum Vernonia (8) Piptocarpha, Elephantopus (3), Piqueria, Adenostemma, Ageratum, Stevia, Eupatorium (25) Mikania (5) Adenostyles (2) Trilisa, Brickelia, Liatris (5) Haplopappus, Aster (6) Erigeron (9), Conyza and Baccharis (14)—W HIMMELBAUR and W MARTINI DESS *Scientia Pharm* 6 (1935) 13 (M F W D)

Digitalis Leaf—East Indian Report of the Investigation of Twenty-nine samples of digitalis leaf grown in Java were investigated comparatively with some European samples Considerable difference between the East Indian and European leaves was observed The infusion of the East Indian Leaf showed a stronger cumulative effect Somewhat different results were obtained in the determination of the Hoekstra fractions (the East Indian leaf had a higher digitaline fraction) The author believes that some of the differences between the European and the East Indian leaves was due to the rapid drying of the latter resulting in its stabilization Charts and tables of pharmacological data are given—U G BIJLSMA *Pharm Weekblad*, 72 (1935) 255 (E H W)

Drugs—Scheme for Microscopic Examination of Discussion of a scheme for the microscopic examination of drugs—E SKARMITZL and Z BLAZEK *Časopis Českoslov Lékárnictva*, 14 (1934) 301–305 through *Chem Zentr*, 106 (1935), 749 (G B)

Grindelia Robusta, Nutt—Histologic Study of A histologic study of root stem, leaf bracts and inflorescence of the plant Special reference is given to the oleo resinous secretory apparatus and its anatomic location—J GIROUX and J SUSPLUGAS *Bull sci pharmacol*, 42 (1935) 89 (C T I)

Kola—Jamaica and Madagascar The most of the kola-nuts on the European market have been coming from Africa these being preferred because of their supposed higher content of caffeine To verify this a supply of Jamaica kola nuts were obtained, examined and assayed according to the procedure of the Swiss Pharmacopœia Fifty of the nuts were assayed individually and the average content of purine base was found to be 1.74% This is well above the requirements of the Pharm Helv V (not less than 1.5%) Forty Madagascar kola nuts were similarly assayed and showed an average of 1.33%—L ROSENTHALER *Pharm Acta Helv*, 10 (1935) 47 (M F W D)

Psyllium Seed—Further Studies on Reference is made to earlier studies The present report covers examination of new lots of seeds from Spain and France plants with mature fruit and seed from growers in France and Spain, comparison with herbarium specimens and with standard descriptions of the species involved Examinations included external morphology cross sections and the mucilage swelling factor by the method previously outlined The report is well illustrated The following conclusions are reached Good French and Spanish psyllium seeds of the current American market are yielded by *Plantago psyllium* and *Plantago arenaria*, *Plantago psyllium* seed is superior to *Plantago arenaria* seed in mucilage swelling capacity, while most of the French psyllium seed is coming now from *Plantago arenaria* and less from *Plantago psyllium*, occasional lots are mixtures of the two with rarely some *Plantago cynops*—HEBER W YOUNGKEN *J Am Pharm Assoc* 24 (1935) 207 (Z M C)

Rhubarb—Cultivation of Medicinal Russian and Chinese rhubarb are identical in their active constituents The Russian rhubarbs recommended are *Rheum palmatum* and *R officinale* Rheum Emodi contains only traces of active constituents—D SCHTSCHERBATSCHEW *Sowjet Pharmac* (Russ Ssovjetskaja Farmacija) 5 Nr 2 25–27 1934 through *Chem Zentr* 106 (1935) 270 (G B)

Syzgium Jambolana—Notes on In literature the cortex and fruits appear also under the names *Eugenia Jambolana* Lam and *Calyptanthus Jambolana*, W In medicine the fruits, rinds and leaves are used as aromatic astringents and as a dye The pharmacognosy of the fruits and rinds as well as the investigations of various workers are reported —DRAPIEN *Apoth Ztg*, 50 (1935), 112 (H M B)

ANIMAL DRUGS

Fish Liver—Preservation of, for Oil Production To prevent destruction of vitamins by enzymic and bacterial action the liver is heated by means of steam to about 90° and immediately before, during or after the heating Ten Kg sodium chloride per 100 Kg liver is dissolved in the mass After the cooling of the mass, the container is closed —ANTIESPLSKABI T FERROSAN Dan Pat., 48,412, Feb 19, 1934

Musks—Natural Natural musk, as understood by the perfumer, is an animal secretion and like other natural fixatives, ambergris, civet and castoreum, is valued not only for its own odor and fixative qualities, but because it can impart a vitality to a perfume Ambergris is the only one which is apparently unconnected with the sexual life of the animal producing it Castoreum, civet and musk are all glandular secretions and their production is connected with the breeding season The musk of commerce is produced by the musk deer (*moschus moschiferus* L.) The musk pod is entirely absent in the female and is a small more or less spherical sac, situated near the animal's abdomen It varies in weight from about 10 to 50 Gm, when trimmed of hair and superfluous skin When cut open, the pods consist of about 70% of their gross weight of a black or reddish brown granular substance which is the musk itself When exposed to the air it has a strong ammoniacal odor There are many varieties of musk offered under such names as Assam, Nepaul, Yunnan Indian, Tonquin and Cabardine Tonquin musk provides 80 to 85% of the world's supply The deer producing this quality live on the southern slopes of the Thibetan mountains Adulteration is carried out fairly widely by the extraction of the genuine musk through the natural vent on the exterior side of each pod and the substitution of most anything A pure dry musk should contain from 50 to 75% of water soluble material, but only 10 to 15% of matter soluble in alcohol The moisture should not exceed 12 to 15% and the ash not more than 8% Muskone has been isolated from musk to the extent of from 0.5 to 2% Perfumers use the musk in the form of a 3% solution in alcohol and the longer the tincture is kept, the better, six months being accepted as the minimum —A C STIRLING *Chem and Drug*, 122 (1935), 316 (T G W)

PHARMACY

GALENICAL

Atropine Group—Homeopathic Tinctures of Twelve homeopathic preparations prepared from *Belladonna* (plant, mature and immature fruits, root and seed) *Hyoscyamus niger*, *H. scopolia*, *Datura stramonium* (herb and seed), *Datura arborea* flowers, *D. metel* seeds and *Duboisia* are reported containing alkaloids of the atropine group The tinctures and the homeopathic dilutions of these preparations are characterized according to their reaction to the Vitali and Fehling tests, their alkaloidal contents are determined and the completeness of the extraction of the total alkaloidal content is discussed The tinctures are biologically tested on the eye of the cat for their mydriatic action and the limits determined for this action The fluorescence phenomena of the tinctures and their dilutions are fixed, measured according to Rojahn and the detectable limits determined This method permits certain distinctions between *Belladonna* and *Hyoscyamus niger* and between the other two *Hyoscyamus* species due to their scopolletin content The capillary power and its fluorescence phenomena is also described the results of which correspond to the previously mentioned determinations The results are tabulated in five tables —A KUHN and G SCHAFER *Pharm Zentralh* 76 (1935), 49 (E V S)

Cherry Laurel Water and Solution of Hydrocyanic Acid—Preservation of, by Paraffin Oil and Vaseline Stability studies on cherry laurel water and hydrocyanic acid solution revealed, (1) placing a layer of vaseline or paraffin oil over the surface of the preparation prevents deterioration considerably with vaseline being the better preservative, (2) 1% tartaric acid is a good stabilizing agent alcohol a fair one, (3) preserving in a refrigerator prevents loss of hydrocyanic acid,

(4) containers (glass) with thick walls keep the preparation better than thin walled containers and (5) warmth and light rays hasten deterioration greatly For an every day dispensing set up, the authors recommended a stoppered bottle surrounded with a layer of black paper and provided with an outlet in its base so that the solution or water may be drawn off without disturbing the superimposed layer of vaseline or paraffin oil —A GUILLAUME and G DUVAL *Bull sci pharma col* 42 (1935), 74 (C T I)

Cream or "Watersalve"—Preparation of Tenacious The tenacious mucilage from plants, especially psyllium seed is obtained by rapid boiling The mucilage thus obtained is used to replace swelling drugs such as powdered tragacanth —F FUNCK D R P 603528 Kl 30h from 16/1 1932 rendered 10/10/1934 through *Chem Zentr* 106 (1935), 109 (G B)

Ipecac—Contribution to the Knowledge of the Extraction of Ipecac root contains the alkaloids cephaeline and emetine which must be extracted quantitatively and the alkaloids psychotrine hydroipecamine and ipecamine, saponins ipecacuanhin (a glucoside) and ipecacuanhic acid (a tannin like substance) all of which, according to previous research seem to be without desirable activity In previous work on ipecac the following variables have been taken into account Fineness of the powder, period of heating, combinations of extraction media and concentrations of the solvents In this paper we have chosen to vary the maceration process while maintaining a constant temperature and pressure thereby eliminating these factors from consideration As variables we have chosen the fineness of the powder the alcoholic strength of the menstruum and the time allowed for the action of the solvent on the drug Cartagena Ipecac of the U S P X was separated by hand into gray Cartagena roots smooth roots with rhizomes, and red-brown roots which were then dried to constant weight at 40° C Total ash determinations were run on each group, and determinations of the alkaloidal content using the method of the Pharm Helv V To study the effect of the fineness of the powder the gray Cartagena roots were powdered in a drug mill to a coarse powder and then sieved through a set of U S P X standard sieves into 6 powders of uniform fineness The results of ash and alkaloidal content determinations show that the finer the powder the higher the alkaloidal content Tinctures were then prepared using powders of the six degrees of fineness prepared above and each was extracted with menstrua containing 35 55 75 and 95 per cent alcohol by volume making 24 tinctures in all Ten parts by weight of the menstruum were weighed into a flask and vigorously shaken with one part of the drug once each hour for six consecutive hours and then filtered through a No 1 Whatman filter The temperature was maintained at 23° C throughout Each tincture was then assayed for alkaloidal content by the method of the Pharm Helv V The dry residue was determined by evaporation and drying to constant weight at 95° C The results were represented graphically A second series of tinctures was prepared from all gray roots of uniform alkaloidal strength the roots being powdered by hand sieved and treated in exactly the same manner The results paralleled closely those of the first set A new shipment of Cartagena Ipecac was obtained sorted and only the gray roots used to prepare a third set of tinctures all factors being kept the same as in the first series except that drug reduced to a No 100 powder of uniform ash and alkaloidal content was used and that the time allowed for maceration was varied into periods of 1 3 24 and 48 hours the same percentages of alcohol being used The drug was shaken vigorously with the menstruum six times at regular intervals depending on the total time allowed for extraction The menstrua containing 35 and 55 per cent alcohol extracted all of the alkaloids in one hour In a final series of tinctures where the process of maceration was combined with pressure by rubbing the drug and menstruum together in a mortar it was shown that hard rubbing and the use of fresh portions of solvent increases considerably the speed of the extraction in the cases of the more concentrated solvents —K STEIGER *Pharm Acta Helv* 10 (1935) 59 (M F W D)

Solution of Iron and Ammonium Acetate, U S P X—Stabilization of Variation in order of mixing ingredients showed no advantage in stability of product and mechanical mixing had no advantage over hand mixing Storage at refrigerator temperature prevented deterioration The addition of acetic acid up to 13 per cent of dilute acid in the finished preparation increased stability Time of precipitation was found to be inversely proportional to the quantity of acetic acid present daily agitation has no effect on time of precipitate formation The addition of alkali in concentrations of 5 per cent or more of alkali exerts a stabilizing influence By exactly doubling the concentration of active ingredients a stable preparation was obtained —W J HUSA and L J KLOTZ *J Am Pharm Assoc* 24 (1935) 125 (7 M C)

Nitroglycerin Tablets—Influence of Method of Preparation of, on Nitroglycerin Content The temperature of drying has much influence on the content of nitroglycerin. The smallest loss was observed in drying at 20° for 5 minutes. Loss depends also on the concentration of nitroglycerin used. Solutions containing more than 1% should not be used.—ZSIGMOND BARI *Magyar Gyógyszerészeti Társaság Értesítője*, 11 (1935) 68-81, through *Chem Abstracts*, 29 (1935), 2303

Tinctures—Evaluation of, Made according to Six Different Procedures Twenty four tinctures were prepared (1) by maceration according to Phar Hung III, (2) by double maceration according to Phar Ital, (3) by digestion according to Phar Hung II, (4) by a treatment on steam bath with reflux cooler for 3 hours, (5) by percolation according to Phar Hung III and (6) by diaculation in a special 3 tube apparatus. Best colors and transparency were obtained by percolation and diaculation. Specific gravity varied from 0.89 to 0.91. Dry matter content varied but little, it was lowest in tinctures made by maceration and highest in those made by diaculation, percolation and steam bath treatment. Ash was lowest in the digested tinctures and highest in the percolated and diaculated tinctures. Diaculation and percolation products were highest in active matter, maceration tinctures were lowest.—ZSIGMOND BARI *Magyar Gyógyszerészeti Társaság Értesítője*, 11 (1935), 37-67, through *Chem Abstracts*, 29 (1935) 2303

PHARMACOPŒIAS AND FORMULARIES

British Pharmaceutical Codex—Review of The *monographs* are divided into three sections covering (1) methods of manufacture (2) standards and methods of assay and (3) actions and uses of the drugs in question. The "actions and uses" section is itself subdivided whenever this is possible into (1) pharmacological action and therapeutic use, (2) methods of administration (3) incompatibilities (4) antidotes and (5) doses. In the third section substances occurring in the Brit Phar are included in the Codex and the official standards are also included, as also are the actions and uses of these drugs. Among the substances which are included in this issue for the first time are mercurochrome, liver extract, stomach extract, insulin, peptone, scarletina toxin and antitoxin, specific sera against botulism, dysentery, plague and infections by streptococci, pneumococci and meningococci. In the articles dealing with these sera an account of the typing of the organisms concerned is given, and the bearing upon immunization therapy. The Brit Phar antitoxins (diphtheria, tetanus and gas gangrene) toxins (tuberculin diphtheria and vaccinia) and "vaccines" (bacterial antigens) are included and the actions and uses described. In the section dealing with the actions and uses of ephedrine, ergot and the pituitary hormones the material has been extended and brought up to date.—L. HORDER *Pharm J* 134 (1935) 210 (W B B)

British Pharmaceutical Codex 1934 The author reviews the B P C 1934 and comments on its legal aspects and its status overseas. The section on Surgical Dressings the Formulary and the Appendices are discussed briefly. Many reasons for revision are given.—C. E. CORFIELD *Pharm J* 134 (1935) 297 (W B B)

British Pharmaceutical Codex 1934—Medical Aspects of The usefulness of the Codex to medical practitioners is found in the correlation of pharmacology and therapeutics. It supplies in one volume a great amount of *ad hoc* information which cannot be obtained in any other place. The detailed activities and uses of drugs and the most appropriate methods of administration are very useful in the writing of prescriptions. A feature of the Codex as a text is the excellent way in which it describes preparations such as elixirs, colloidal solutions, emulsions, etc., and the methods of sterilization—tyndallization, pasteurization etc.—J. ORR *Pharm J*, 134 (1935), 233 (W B B)

British Pharmaceutical Codex 1934—Pharmaceutical Aspects of Among the vitamin preparations contained in the Codex are (1) Liquor Vitamin A a standardized preparation, and (2) Extract of Malt with Vitamins containing 1% of Liquor Vitamin A and 1.5% of Liquor Ergosterols B P with Extract of Malt. No official Codex preparations of vitamin C are included except fresh orange and lemon juice and their concentrated preparations. Incidentally the Codex states that lemon juice is stable at room temperature for at least fourteen months if the *pH* is kept at its natural acidity point of 2.2 even though it may be heavily infected with moulds and yeast. Injection of Sodium Morrhuate and Injection of Quinine and Urethane are two interesting Codex preparations. The latter will deposit on cooling and the former may do so but

both will clear on warming they should be warmed prior to injection Peptone, for injection purposes is required by the Codex to be free from more than traces of histamine Digitalin of the Codex is now standardized for a biological assay has been introduced whereby this mixture of glucosides is assayed and standardized just as *Digitalis Pulverata* is It can be given either subcutaneously or intramuscularly and a 3% injection is included In the Formulary it is suggested that *Collyria* be not prescribed with an aromatic water as the basis because of the difficulty of sterilization *Nebulae* should be prepared with *Paraffinum Liquidum Leve B P C*, which has a lower specific gravity and lower viscosity than the official liquid paraffin The formulas for emulsions are designed for hand made preparations, and when such are made in a homogenizer the quantity of gum may be reduced otherwise the emulsion would be far too thick Another revolutionary change is the introduction of a dye, azorubrum intended to replace cochineal The method of preparing green extract of belladonna has been radically altered It is no longer made from fresh belladonna leaf juice but is an alcoholic extract which is assayed and then adjusted with liquid glucose to 1% of total alkaloid —H BERRY *Pharm J*, 134 (1935), 233

(W B B)

Sterilization—Notes A selection of proposed formulas for the Chilean 'Formulario Oficial de la Asquifa' includes Injection of Hexamethylenetetramine and Injection of Morphine Hydrochloride Mercurial solutions for injection as follows Injection of Mercuric Cyanide Injection of Mercurochrome and Injection of Mercuric Iodide These mercurial injections which contain the equivalent of 1% of mercury are supposed to be isotonic and neutral —*Pharm J* 134 (1935) 235

(W B B)

Swiss Pharmacopœia—Review of The new Swiss Pharmacopœia contains 1050 items 304 new items have been added and 108 have been dropped from the 4th edition Besides 43 pages of introduction it contains 1244 pages The book is divided into four parts, viz, introduction general part, special part (containing the monographs) and tables History is given from the Ticinese Pharmacopœia of 1844 (the first cantonal Pharmacopœia) to the present time The committee for the 5th edition was appointed in 1922 the work of revision requiring 10–11 years The general part of the Swiss pharmacopœia is discussed at length the discussion involving drugs pharmaceutical specialties methods for determining weights measures temperature and other constants The reviewer speaks of the new Swiss Pharmacopœia as a *modern pharmacopœia* —T POTJEWIJD *Pharm Weekblad* 72 (1935) 170

(E H W)

Swiss Pharmacopœia—Review of the Monographs of The reviewer discusses the new 5th Swiss Pharmacopœia with special reference to the monographs These are discussed as to form content tests etc Botanicals chemicals tinctures decoctions emulsions pills, galenicals etc are considered in groups —T POTJEWIJD *Pharm Weekblad* 72 (1935) 214

(E H W)

NON OFFICIAL FORMULÆ

Astringent Lotions These lotions should be called 'stronger lotions' and probably are more effective in correcting oiliness with which blackheads are associated rather than refining coarse pores The following are some type formulas (1) Glacial acetic acid 2.00%, zinc sulphate 0.15%, alum 2%, glycerin 4%, menthol 0.08%, alcohol 20%, water 71.52%, perfume 0.25% (2) Alum 2%, magnesium sulphate 4%, boric acid 2%, formaldehyde 0.1%, glycerin 3%, alcohol 20%, water 68.7%, perfume 0.2% (3) Aluminum chloride 2%, boric acid 1%, glycerin 4%, alcohol 15%, water 77.75%, perfume 0.25% Dissolve the perfume oil in alcohol and the water soluble chemicals in water and stir in the perfumed alcohol mix thoroughly and filter ANON *Drug and Cos Ind* 36 (1935) 39

(H M B)

Cleansing Cream—New A cream which does not separate in summer and gives a good lather when mixed with water and is recommended for sensitive skins and as an adjunct in the treatment of acne is made as follows Stearic acid 20% liquid petrolatum 5, triethanolamine 5, coconut oil soap water 40 glycerin 5 Heat the first 3 ingredients to 85° heat the glycerin and water to the same temperature and dissolve the coconut oil soap maintaining the temperature Add the soap solution to the stearic acid slowly and with stirring and continue stirring until cool —J G DOWNING *Drug and Cos Ind*, 36 (1935) 420

(H M B)

Cosmetic Preparations—Borax and Sulphur in The uses of borax especially its combination with glycol are discussed and the following formulas offered Cold Cream —Glyco wax—

beeswax 20 parts, liquid petrolatum 120 parts, water 54 parts, borax 2 parts, perfume 1 part. Melt the first three substances together, dissolve the borax in the water and heat both mixtures to 65° C and then stir slowly the borax soln into the wax mixture. Pour out the cream at 50° and add more water, if desired, to make the cream softer. *Vanishing Cream*—This type usually has a silver like appearance due to the use of paraffin, boric acid and glycerin with borax usually added as an antiseptic. 10.5 Kg stearic acid, 0.5 Kg almond oil, 375 Gm KOH, 1 Kg ammonia water (sp gr 0.88), 1 Kg borax, 8 Kg water. Melt the mixt of almond oil and stearic acid, pour the mixt at 82° C into the aq soln of alkali, heat to boiling, cool to 70° C, allow to stand over night. By repeated warming to 38–43° and cooling with occasional stirring a good lustre is obtained in about 3 days, then stir in the glycerin and perfume. *Sulphur* and colloidal S apparently are valueless in the care of the hair because of their insolubility but oil soluble S Sb preparations (sulfoform) seem to show promise since the S is in an ionic form as the SH-ion. Commercial S products have particles of the following sizes: in μ lime sulphur (sulphur layer) > 1, colloidal S (drop like) < 0.6, sulphidal (difficultly discernible structure) 3–6 and 16, extremely finely ground S (cryst) 2–4, mean 10.7, "Wackenrodisch" solution (aq soln of H₂SO₄ saturated with H₂S with cooling and exclusion of light) (crystals with smooth surfaces) 3–50, precipitated S (crystals with curved surfaces) 6.4–16 and 32–48, flowers of S (crystals) 6–40, 32–48, ground cryst S (crystals) 15–80. Final evidence shows that borax is in demand in these preparations on the basis of physico chemical properties, S, however is a substance which presupposes a chemical dermatological knowledge for its use and without this is purposeless.—TH. RUEMELE *Riechstoff Ind*, 10 (1935), 22–25 (H. M. B.)

Cetyl Alcohol—Applications of, in Cosmetics. Cetyl alcohol used in the base of non fatty creams has been found to be readily absorbed by the skin. As a tested formula the following mixture is recommended: 70 parts vaseline, 20 parts paraffin, 10 parts cetyl alcohol, 5 parts anhydrous lanolin, with 100 parts water. The addition of cetyl alcohol proved to have a marked retarding effect upon the onset of rancidity and, moreover, increased greatly the capacity for taking up water.—DR. S. MALOWAN *Perf and Ess Oil Rec* 26 (1935), 52 (A. C. DeD.)

Cold Balms. The following experimental types are offered: (1) *Petroleum Jelly Type*—Menthol 0.7%, methyl salicylate 5.8%, camphor 8%, eucalyptol 5%, mustard oil 0.5%, soft short fibre, white petrolatum 80%. (2) *Petroleum Jelly Type*—Menthol 0.7%, chloral hydrate 9%, camphor 9%, methyl salicylate 10%, oil of cade 5%, soft, short fibre, white petrolatum 66.3%. In both cases dissolve the camphor and menthol in the mixed oils, melt the petrolatum at 105° F and stir in the previous mixt. (3) *Water-in Oil Type*—Menthol 1%, mustard oil 1%, eucalyptus 15%, camphor 1%, absorption bases derived from lanolin 30%, water 45%, stiff, long fibre white petrolatum 7%. Dissolve the menthol and camphor in eucalyptus oil and add mustard oil. Melt the petrolatum and add the lanolin base maintaining the temperature at 45° C, stir in the above mixture followed by water at the same temperature, mix until an emulsion is formed. (4) *Oil in Water Type*—Glyceryl monostearate 12%, white beeswax 6%, methyl salicylate 5%, menthol 1%, camphor 1%, mustard oil 0.5%, water 74.5%. Place the stearate, wax and water in a kettle heat until the stearate melts and the whole becomes white and homogeneous. Dissolve the camphor and menthol in the methyl salicylate and add the mustard oil. Cool the mass to 50° C and add the latter mixture. This product is characteristic of the so called "greaseless balm" type.—ANON. *Drug and Cos Ind*, 36 (1935) 279–280 (H. M. B.)

Cosmetic Products—Hydrogen-Ion Concentration of I. Fatty Skin Creams. This type of preparation is considered a water-in oil type of emulsion, and when put on the skin the fatty portion is resorbed in part while the water remains in a great part on the surface producing a characteristic cooling action by its evaporation. With aqueous suspensions of seven commercial creams of American, English and Spanish origin, using p nitrophenol, phenol red and β di nitrophenol as indicators in color comparators three were slightly alkaline, one acid and three neutral, with alcoholic solutions of the same, two were acid, two nearly neutral and the p_H of three were not determined because extremely turbid alcoholic solutions were obtained. It is concluded that wax free fatty creams in alcoholic solutions are almost neutral while those containing waxes are acid.—KARL PFAFF *Riechstoff Ind*, 10 (1935), 6 (H. M. B.)

Eau de Cologne. A discussion of Eau de Cologne its constituents and manufacture with or without distillation is given. In preparing a cheaper type of perfume use is made of isopropyl alcohol, or a mixture of this with ordinary alcohol as a solvent for the oils. Synthetic oils are

used in place of the extracts employed in the better grade. A method for preparing solid Eau de Cologne is also given—H SILMAN *Perf and Ess Oil Rec*, 26 (1935), 45 (A C DeD)

Feminine Hygiene Jellies The following formulas are offered *Lactic Acid Jelly (Starch Glycerite)*—Lactic acid 1% boric acid 5% glycerite of starch, U S P a sufficient quantity. It is advisable to dissolve the boric acid in the glycerin before preparing the glycerite. An alkali starch produces a more stable jel than an acid starch. *Lactic Acid Jelly (Gum Tragacanth)*—Lactic acid 1.5% boric acid 4% glycerin 10–30%, tragacanth (depending on quality) 2.5–4% water a sufficient quantity. Cooking the tragacanth and selection of a good quality helps preserve the jel. The use of less than 20% glycerin produces a jel which is apt to harden. *Lactic Acid Jelly (Gum Karaya)*—Lactic acid 1.5% boric acid 4%, glycerin 5–20% gum karaya (depending upon quality) 3–5% water, a sufficient quantity. This is a new formula and is growing in popularity. The advantages and disadvantages of each of the above are discussed. Such acids as acetic citric and tartaric have also been used but lactic acid is preferred since it is already present in vaginal secretions and boric acid tends to maintain the acidity of the jelly in the presence of the protective colloids in the semen. Quinine and oxy-quinoline have little or no spermicidal value. All jellies of this type should have some aromatics and a cologne 1–3000 strength is recommended—STROUGHTON *Drug and Cos Ind* 36 (1935) 30, 39 (H M B)

Lip Stick The composition, the molds, the coloring, the smoothness on application, the brightness and the perfuming of lip sticks are discussed—A G AREND *Perf and Ess Oil Rec* 26 (1935) 39 (A C DeD)

Lip Sticks—Chemistry of Dibromo and tetrabromo derivatives of fluorescein have replaced vegetable dyes and alloxan as coloring agents in indelible nontoxic lipsticks. Tasteless castor oil appears to be more satisfactory as a solvent for these colors than butyl stearate and other esters. Irritations to some individuals seems to arise due to compounds produced by removal of Br atoms of the dye molecule and their combination with unsaturated ricinoleic acid. Care should be taken to use the proper proportions of the dye and oil (5% dye and 15% oil). The ideal stick should have the following properties: (1) spread in a thin layer (2) m.p. 118° F (3) possess sufficient tackiness (4) shall not impart an unnatural or stiff feeling to the lips (5) tasteless, (6) permanent in color and should have about 75% vegetable and animal oils and waxes and the remainder mineral oils and paraffins. Lanolin is added to give tackiness and counteracts irritation and drying effects of the dye. Beeswax (not over 10%) and ceresin are used to give consistency and to bind the castor oil. Ozokerite to give a more easily crushable stick. As stiffening agents carnauba wax (10%) and paraffins are added, as a lubricant mineral oil is preferred. Absorption bases to decrease irritation and dryness such as cetyl alcohol are necessary—THORPE DEAKERS *Drug and Cos Ind* 36 (1935) 273–274 280 (H M B)

Passiflorine A correspondent inquires as to the composition of 'Passiflorine' and the Latin nomenclature corresponding to the following: 'Extrait fluide de passiflore,' 'Extrait mou de Saule blanc' and 'Extrait mou de Cratægus oxyac.' The reply is 'Passiflorine' (German 'Passiflorin') consists of,

Extractum Flor Passiflor incarnat	0.5 Gm
Extractum Salicis albæ	0.25 Gm
Alcoholatura Cratægi oxyacanthæ	gtt XX
Sirupus Sacchari et Glycerin q s ad	5 cc

H J VAN GIFFEN *Pharm Weekblad* 72 (1935) 177 (E H W)

Shaving Cream—Latherless A mixture is prepared containing stearic acid 11, lanolin 10, coconut oil 0.3, concentrated ammonia water 1.35, paraffin wax 6, spermaceti wax 2, boric acid 1.5, water 75 parts, together with small quantities of menthol, camphor and perfume—GEO D GETTEMULLER and SAMUEL L GOLDHEIM U S Pat 1 991 501 Feb 19 1935 (S W G)

Skin Creams—New Bases for New bases mentioned are (A) *Hydrocerin* and *Boerocerin* which are especially resorbed by the skin. They increase the resorption of creams containing fats and are unsaponifiable and never become rancid. *Hydrocerin* creams produce a fatty appearance on the skin and *Boerocerin* creams leave the skin lustreless, such creams are used as day and night creams and are of value as powder bases. The latter base is used in the preparation of the finest American creams which are very homogeneous and have a constant consistency changing but little with extreme changes in temperature. These properties are due chiefly to the high

cholesterin content (B) *Almecerin and Cefatin*—The former is a bright yellow substance with a slight odor of wool fat, indicating the presence of cholesterin and produces water in-oil creams. The latter which is the base for dry creams of the oil in water type, is of wax like consistency and almost white. The following recipes are of interest (1) *Base*—

	Hard	Medium	Soft
Hydrocerin	8%	8%	5%
Paraffin	8%	—	—
White vaseline	84%	92%	95%

(2) *Cream for Browning of the Skin*—Hard base 40%, liquid petrolatum 10%, distilled water 50%–100% (3) *A Universal Cream*—Hydrocerin 2 17%, paraffin 50/52, 1 17%, liquid petrolatum 8 33%, white vaseline 21 67%, distilled water, 66 66% (4) *American Creams*—Boerocerin 2 66%, liquid petrolatum, 4%, paraffin, 6 66% white vaseline, 20%, glycerin 3 33%, distilled water, 66 35% (5) *Fatty Cream Base*—Almecerin, 50%, water, 50% (6) *Toilet Cream* (easily rubbed in and slightly fatty)—Almecerin, 40% water, 60% (7) *Glycerin Toilet Cream*—Almecerin, 40%, glycerin, 10%, water, 50% (8) *Fatty Cream*—Almecerin, 40%, liquid petrolatum, 20%, water, 40% (9) *Lanolin Cream*—Almecerin, 28 6% lanolin, 14 3%, water, 57 1% (10) *Day Cream Base*—Cefatin, 25%, water, 75% (11) *Glycerin Day Cream*—Cefatin, 25%, glycerin, 75 %, water, 67 5% (12) *Fatty Day Cream*—Cefatin 25%, liquid petrolatum, 6 25%, water, 68 75% (13) *Cream with Mother of Pearl Appearance*—Cefatin, 24 4%, glycerin, 4 9%, water 68 2%, alcohol, 2 5% (14) *Mixed Cream*—Cefatin, 18 9%, stearin 6 3%, almecerin 5 7%, glycerin, 2 6%, water, 66 5%—K. P. RAEFF *Rueckstoff Ind* 10 (1934) 157–158 (H M B)

Soap—Improving Additions to An invention relating to processes for the manufacture of soaps to which might be added substances has been described by Victor Boulez. Its object is to give to the soap pastes improved physical, detergent or other qualities, and to suppress or diminish soap losses. The addition of substances removes from soaps their hygroscopic character and increases also their keeping qualities. Some of the substances which can be added are enumerated—*Perf and Ess Oil Rec*, 26 (1935) 68 (A C DeD)

Soaps—Some Disinfecting A discussion of soaps having a definite disinfectant action including carbolic soaps, cold process carbolic soaps, cresol soaps, iodine soaps, sulphur soaps and mercury soaps is given—*Perf and Ess Oil Rec*, 26 (1935), 69 (A C DeD)

Sunburn Preventives Any compound which will fluoresce in ultraviolet light of 2900–3100 Å° will protect the skin from destructive rays of the sun. The following are suggested: benzyl salicylate, menthol salicylate, æsculin, o oxyæsculin, tannic acid, phenyl salicylate, quinine bisulphate, oleate and hydrochloride, ethyl *p* amino benzoate, sodium naphthol 6 8 disulphonate, β oxy-naphthoic acid, 6 oxy-2 naphthoic acid, α naphthol 8 sulphonic acid, β naphthol 3 6 disulphonic acid. As vehicles vegetable oils are useful. The following recipes are offered: (1) *Oil*—Benzyl salicylate 8%, menthyl salicylate 5, olive oil 43, cottonseed oil 43, perfume 1. (2) *Lotions (a)*— β oxy-naphthoic acid 3%, quinine bisulphate 2, alcohol 15, glycerin 5, rosewater 75. Dissolve the quinine in the alcohol and the acid in the rose water and glycerin, mix and filter. (b) Sodium naphthol 6 8 disulphonate 5%, ethyl *p* amino benzoate 1, alcohol 15, glycerin 5, witch hazel 74%. Dissolve the 1st ingredient in the witch hazel and the 2nd in the alcohol and glycerin and mix the two solutions. (3) *Creams*—(a) Quinine bisulphate 4% absorption base from lanolin 25, white mineral oil 15, alcohol 10, glycerin 5, water 40, perfume 1. Dissolve the quinine in alcohol and add glycerin and water, warm to 130° F. Heat the base and oil until melting occurs and then stir in the quinine solution slowly. (b) White beeswax 7%, glyceryl monostearate 12, white mineral oil 5, petrolatum 3, glycerin 3, alcohol 10, benzyl salicylate 5, menthol salicylate 3, perfume 1, water. Heat the stearate, wax, oil and petrolatum together until melting occurs and mix until congealing takes place, then stir in a solution of the other ingredients and stir until ready for filling—*Drug and Cos Ind*, 36 (1935) 417–418 (H M B)

Tooth Pastes—Children's The basis of use and manufacture of tooth preparations are discussed. Investigations show that children dislike mouth and tooth preparations because of their odor, taste, grittiness and local astringent or irritant effects. Very fine calcium and magnesium carbonates are recommended as mechanical cleansers with tragacanth as a binding agent, neutral glycerin, a blend of oils of peppermint and anise with saccharin as a sweetening agent—A. R. BLISS, JR. *Drug and Cos Ind*, 36 (1935) 409–410, 416 (H M B)

Turtle Oil Creams Only recently, turtle oil has been introduced into pharmaceutical products and information regarding the substance is somewhat scarce. After twelve months' observation, the author claims the oil to be beneficial to the complexion, and when mixed with other nutritive oils makes an ideal wrinkle cream. Best results were obtained when it was used in a 50% concentration with oils such as almond or olive oil. Turtle oil melts at 15° C, being just able to pour, at 20° C, it becomes a liquid, and at 25° C, it is liquid and clear. Turtle oil is not granular to the feel between the fingers at 10° C, although it has that appearance. The author gives two formulas as follows, for anti-wrinkle creams containing turtle oil.

	A	B
Turtle Oil	50	30
Almond Oil	27	46
Lanolin	15	16
Beeswax	8	8

In Formula B, enough turtle oil is included to claim the title, but in this case the object is to aid the assimilation of the others. The most suitable preservatives are the hydroxybenzoic type—C DOUBLEDAY *Chem and Drug*, 122 (1935), 269 (T G W)

Vanishing Creams These have as ingredients (a) triple pressed stearic acid, melting point not less than 56° (10–25%) (b) glycerin, (c) alkalis as potassium and sodium hydroxides, potassium and sodium carbonates to form a soap, the potassium compounds produce a soft cream, sodium compounds a harder cream. The following formulas are suggested. (1) Stearic acid triple pressed 20%, KOH 1.5 H₂O 68.5, glycerin 5, alcohol 4, perfume 1 and HCHO solution 0.05. Melt the acid and heat to 212° F, dissolve the KOH in 30% of the H₂O and heat to 212° F, add the hot alkali to the acid with constant agitation and continue until emulsified and add the remainder of the water and glycerin after heating to the same temperature. Add the alcohol in which the perfume has been dissolved, allow to age. This cream is fairly soft. (2) Stearic acid 20% glycerin 10 K₂CO₃ 0.8, Borax 0.4, H₂O 64, alcohol 4 perfume 0.8, HCHO solution 0.05. Heat the water and glycerin into which has been dissolved the salts to 212° F, melt the acid and heat to the same temperature. Start mixing the water glycerin solution and slowly add the acid, mix until the temperature has reached 120° F, then add the HCHO solution, alcohol and perfume, mix for 20 minutes longer. This produces a harder cream than (1). (3) Stearic acid 25%, lanolin (anhyd) 4.5 triethanolamine 1.35, carbitol 9, H₂O 60, perfume 0.15. Heat the acid and lanolin to 160° F, heat the triethanolamine and water to the same temperature and place in a mixer, add the acid mixture with constant stirring, when smooth add the remainder of ingredients and stir until cold. This produces a cream that is absorbed completely and imparts a softness and smoothness to the skin. (4) Stearic acid 20%, KOH 1, cetyl alcohol 1 borax 0.5, glycerin 10 alcohol 5 H₂O 60, perfume 2.5. Procedure as in (1). (5) Stearic acid 18 parts, K₂CO₃ 1.2 butyl stearate 2.5 H₂O 75 perfume 0.3. Procedure as in (1). Butyl stearate in this preparation is a substitute for glycerin which is apt to absorb moisture from the air and give a sticky feeling—J M WILLIAMS *Drug and Cos Ind*, 36 (1935), 413–414 (H M B)

White Liniment—Suggested Formula for A formula containing triethanolamine crude N N R, is submitted. Both the stirrer method and the bottle method have been tried. White Liniments by other formulas are discussed—L H BALDINGER *J Am Pharm Assoc*, 24 (1935), 130 (Z M C)

DISPENSING

Chloroform—Safety Color for According to the *Apoth-Ztg*, 3 (1935) 32, the question of a safety color for anesthetic chloroform has been considered because of the frequency of accidents through the unnoticed and unintentional employment of chloroform for anesthetic ether. Smell is no absolute protection against interchange of these anesthetics, and for this reason it has been found necessary to search for a distinctive dye for anesthetic chloroform. Results of research have shown that for this purpose dimethylamido azobenzene can be used. A sufficient depth of color is obtained by adding 2 cc of a 0.5% solution of dimethylamido azobenzene (which represents 0.01 Gm of dye) to 50 cc of chloroform. This quantity is stated to be so low that no effect of the dye on the anesthetic is to be expected and the color is easily removed from fabrics.

by ordinary washing or by the use of a weak acid (i. e., vinegar), followed by a thorough rinsing in water —*Pharm J*, 134 (1935), 212 (W B B)

Dispensing—Determination of Reasonable or Permissible Margin of Error in II Ointments Different types of ointments which pharmacists are asked to dispense were divided into three classes—those that only have to be transferred from stock container to a dispensing jar, those which involve the incorporation of a liquid with a fatty or hydrocarbon base, those which involve incorporation of a solid with fatty or hydrocarbon base. Three series of tests were made. The objective of the first was to determine effect on capacity of difference in nature of bases—trituration before packing, incorporation of a liquid, incorporation of a solid—size of jar. The second series aimed to determine variation in capacities of jars manufactured by each of four manufacturers. The third objective was the variation in capacities of jars purchased at random. How these experiments were carried out is explained and the figures are tabulated. The following conclusions were reached: 1. Petrolatum was the lightest of the four bases studied, followed in order by a 50 per cent lanolin and petrolatum mixture, lanolin and benzoated lard when packed as received. 2. The frequency and magnitude of error are greater in cases where the base is packed in the solid state, than in those where the filling is accomplished by melting and pouring, except for benzoated lard. 3. The capacity of jars by weight is decreased by triturating the ointment base on a slab previous to packing in the solid state. 4. The capacity of jars by weight may be decreased or increased by the incorporation of a liquid or a solid with the base, depending on the nature of the liquid or solid and other factors. 5. The percentage of error found was in inverse proportion to the size of the jar. 6. Jars of a designated size made by a single manufacturer do not vary in capacity beyond reasonable limits. There was observed, however, a great variation in the capacity of jars of a designated size made by different manufacturers. The latter variation is due largely to the use of different standards by the manufacturers for fixing capacity. To overcome this condition it is suggested that uniform standards for fixing standards be adopted by the manufacturers, and that the material taken as the basis for formulating these standards be petrolatum because of its comparatively low specific gravity and uniformity with respect to other physical properties. 7. The results of the tests show that it is impossible for a glass manufacturer to prepare ointment jars which will hold the same quantities by weight of the different ointments dispensed on physicians' prescriptions. It is believed, however, that it is possible for them to manufacture ointment jars which will hold within reasonable limits definite quantities of petrolatum or other base selected as a standard. The pharmacist will then be able to dispense the full quantity of an ointment with a low specific gravity. In the case of ointments with a high specific gravity the filling of the jar may be done in such a manner as to leave a concave surface, thereby preventing the ointment from coming in contact with the top of the jar, and also satisfying the patient as to the fullness of the jar. In the case of very heavy ointments such as mercurial ointments it will be necessary to weigh off the quantity prescribed and to dispense it in a jar of the size which it will come nearest to filling. 8. With regard to the margin of error which may reasonably be expected in dispensing where jars of the same manufacture are used—our observations point to a figure which at the outside is twice the standard deviation or 25 per cent for $\frac{1}{2}$ and 1 ounce jars, and twice the standard deviation, or 18 per cent, for 2 ounce jars —*MARVIN J. ANDREWS J. Am. Pharm. Assoc.*, 24 (1934), 350, 421 (Z M C)

Easton's Syrup Strict adherence to the B. P. method for preparation of Easton's Syrup should keep this preparation water-white for six months or more. A still better method is to use Easton's formula which can be found in "Squire's Companion," 1890 —*A. RENNIE Pharm. J.*, 134 (1935), 247 (W B B)

Ointments—Eye Starch, zinc oxide, alkaloids and other substances used in the preparation of ointments, can be sterilized with ether. The ointments should be dispensed in tin tubes —*J. FABICKI Wiadomosci farm.*, 61 (1934), 157, through *Chem. Zentr.*, 106 (1935), 747 (G B)

PHARMACEUTICAL HISTORY

Cosmetics—History of, in Modern Times —*A. HAUENSTEIN Reichstoff Ind.* 10 (1935), 49–53 (H M B)

German Apothecary Faenze of the Renaissance A historical account of old German Apothecaries' Faenze vessels —*FERCHLE Apoth. Ztg.* 49 (1934) 1706. **History of German Apothecaries** pages 5–12 (H M B)

Hamamelis (Witch Hazel), Extract and Distillate—History of In 1865 while the senior author was in the employ of W J M Gordon and Brother Cincinnati the firm also employed a business representative named Leon Hurtt A brother, F W Hurtt, who was a banker in New York proposed to purchase the right to make Pond's Extract, a proprietary medicine used almost exclusively by Homeopathic physicians In 1915 in a personal interview with Leon Hurtt the author obtained authoritative information and has incorporated it in the present paper Pond's distilled hamamelis came to be used by Eclectic physicians and then by Allopathic physicians though chemists and others decided that it had no therapeutic value It is still in use Hurtt's story relates in considerable detail how the Oneida Indians used it and how the "Golden Treasure" later Pond's Extract was prepared how the business grew and prospered —JOHN URI LLOYD and JOHN THOMAS LLOYD *J Am Pharm Assoc* 24 (1935) 220 (Z M C)

Hospital Pharmacists of Amsterdam—Modification in Instruction and Salary Revision of, in 1857 This extensive article by G Hellinga based upon a number of old records and documents describes the life of the Pharmacist in the Amsterdam Hospital in 1857 and the trend of events which led to revision in his status at that time It is of considerable historical interest —*Pharm Weekblad*, 72 (1935) 318-334 (E H W)

"Patent Medicines" The author relates something of the history of Goddard's Drops, Anderson's Pills Dutch Drops Daffy's Elixir Lockyer's Pills and Stoughton's Elixir —J H HOCH *J Am Pharm Assoc* 24 (1935) 147 (Z M C)

Pharmacognosists of Nineteenth Century—Eminent American The life and work of John M Maisch Edson S Bastin and Julius O Schlotterbeck are the subjects of the first installment of an historical paper —H W YOUNGKEN *J Am Pharm Assoc* 24 (1935) 148 (Z M C)

Pharmacognosists of Nineteenth Century—Eminent American (See preceding abstract) The men who are considered this time are Albert Schneider Henry Kraemer Lucius E Sayre and Otto A Wall —HEBER W YOUNGKEN *J Am Pharm Assoc* 24 (1935), 215 (Z M C)

PHARMACEUTICAL EDUCATION

Four-Year Curricula in Pharmacy—Comparison of A critical examination was made of courses in so called theoretical and operative pharmacy as outlined in catalogs of member colleges of the American Association of Colleges of Pharmacy, and the results tabulated Comparison is made with the Syllabus requirement with comments by the author as to what he believes best General comments include some important criticisms The curricula of eleven schools offer too many courses which could be corrected in part by combining a didactic with a laboratory course A few offer seminar courses which are of questionable value for undergraduates There is too much variation in credit value of laboratory courses, some received no credit some gave one credit for four clock hours Courses in use of library and literature might be offered in history of pharmacy courses called research and thesis should be elective Twenty three curricula list courses that apparently are review courses for board examinations Not all curriculum outlines and course descriptions are sufficiently complete and clear —HENRY M BURLAGE *J Am Pharm Assoc*, 24 (1935) 228 (Z M C)

Mathematics—Pharmaceutical Some Observations after Twenty-five Years' Experience in Teaching In the days of the two year course classes needed much drill on tables of weights and measures Their learning was a memory feat Continued use clinches the memory part but to day students seem to get mental pictures of weights and measures as something real though they are not as proficient in the multiplication table as formerly High school students of to day do not have the rich experience drawn from farms and villages that their elders did but when one knows what the high schools are trying to teach one finds many students easier to teach The difficulty of teaching about percentage solutions will be largely solved by the statement that will appear in the next Pharmacopœia A teacher's ingenuity is taxed most in getting students to apply what they know Teachers should not accept answers involving fractional weights or measures but insist on weighable and measurable denominations Also utmost accuracy should be required in the class room They will learn by experience when to use round number factors —EDWARD SPEASE *J Am Pharm Assoc*, 24 (1935) 227 (Z M C)

Pharmacy and Academic Standards—Theory of If practical pharmacy is the 'application of the knowledge and training in physics, chemistry, botany, therapeutics, etc., to the making of medicine,' no college is giving too much time to it. Reasons for this statement are briefly discussed—H A LANGENHAN *J Am Pharm Assoc*, 24 (1935), 158 (Z M C)

Pharmacy and Academic Standards—Theory of Some changes are suggested for the outlines in the Pharmaceutical Syllabus and the paper on the same topic by W Paul Briggs is discussed—H M BURLAGE *J Am Pharm Assoc*, 24 (1935), 156 (Z M C)

Pharmacy and Academic Standards—Theory of Time and credit evaluations need adjustment on a sounder economic basis. The entire four year course should be brought into line with other baccalaureate degree courses—W P BRIGGS *J Am Pharm Assoc*, 24 (1935), 153 (Z M C)

PHARMACEUTICAL LEGISLATION

Surgical Dressings Over 1000 samples of surgical dressings are submitted annually to the Manchester Chamber of Commerce Testing House and Laboratory by the 200 Insurance Committees in England, Wales and Scotland, and a certificate of analysis is issued in respect to each stating whether the dressing complies with the requirements laid down in the B P C. Since the adoption of the testing scheme in 1925, the percentage of deficient dressings has decreased by 90%. Deficiencies were found to be less frequent in manufacturers' or wholesalers' wrappings, as required by the Drug Tariff, than in those which were not so wrapped. Many standards for surgical dressings have been amplified and amended and standards have been instituted for such new dressings as batiste, chloramine gauze, euflavine gauze, cellulose wadding, oiled paper, rubber adhesive plaster, zinc oxide plaster, elastic adhesive bandage, zinc paste bandage and cellulose tissue—ANON *Pharm J*, 134 (1935), 301 (W B B)

MISCELLANEOUS

Advertising—Place of a Field Representative in Coöperative Professional Pharmacists can use the mails for reaching physicians but perhaps the ideal way is to combine frequent personal contact with mail contacts. In a community with a number of stores interested in professional business owners can cooperate in a common advertising program. Advertising funds can be pooled and a full-time representative employed—a man who possesses distinct capabilities for the task of "selling the professional services and personalities of the pharmacies" he represents. Such an individual can be helpful in many other ways at the same time—L W RISING *J Am Pharm Assoc*, 24 (1935), 142 (Z M C)

Cosmetics Report on Progress in 1934—K PFAFF *Riechstoff Ind*, 10 (1935), 38-41 (H M B)

Dentists and Pharmacists—Cooperation between Attention is directed to the natural relation between dentistry and pharmacy, to the work of the Council on Dental Therapeutics. The 'Accepted Dental Remedies' is soon to appear in book form. The author discusses ways in which pharmacists can meet the problem—S M GORDON *J Am Pharm Assoc*, 24 (1935), 136 (Z M C)

New Drugs and Their Standards The article consists of a résumé of an address by Dr C H Hampshire at a meeting of the Bath and District Branch of the Pharmaceutical Society of Great Britain held on February 27 1935. Benzyl benzoate, bromoform, ephedra, the enzymes, the toxins, antitoxins, serums, vaccines and the specific arsenicals were dealt with as instances of the up to date nature of the contents of the Codex. The standards for surgical dressings of the Codex have served a useful purpose in connection with National Health Insurance—ANON *Drug Circ*, 122 (1935), 298 (T G W)

Prescription Compounding The third in a series of papers dealing with prescription compounding. The author discusses the lack of uniformity when a prescription is filled by different people as one of the reasons for physicians dispensing. Physicians dispense proprietaries because they are visited daily by detail men, the moral of which is to do your own detail work. The author does not believe that everything done in a prescription room should be visible by the public any more than that the place should be entirely closed, and he gives reasons for his belief. In his opinion a successful prescription pharmacy cannot be run by one man alone because when a man works at a prescription he should not be interrupted. More than twenty prescriptions are

given Difficulties are discussed and methods for compounding given —J LEON LASCOFF *J Am Pharm Assoc*, 24 (1935) 232 (Z M C)

Prescription Departments—Note on Open The author reports that a number of physicians interviewed were unanimous in their disapproval of a department in which it was possible to see the different ingredients that enter into the finished prescription ' Next to seeing the ingredients the doctors objected to the tendency toward self-medication If the patient sees a poison label unwarranted fear is engendered If a prescription has to be tried a second time the patient may think the pharmacist is lacking in ability or is careless As an alternative the author suggests a visible manufacturing department —J N SILSBY *J Am Pharm Assoc*, 24 (1935), 133 (Z M C)

Professional Outlook In spite of the fact that the public appreciation of pharmacy has slumped, the author is optimistic because of an inherent feeling that pharmacy is an essential and public health profession —L M KANTNER *J Am Pharm Assoc*, 24 (1935) 134 (Z M C)

Publicity—Furthering Pharmaceutical The author believes that the only way to convince the public that skill is used in filling prescriptions is to show what is done A prescription counter that can be seen has an educating value There is an increasing inclination to classify retail drug stores as 'merchandising establishments' Opening the prescription department will show the processes of compounding and manufacturing It may tend to curtail dispensing by physicians There seems to be no reason why some part of the department should not be out of sight in order to permit privacy in working out dispensing problems Untidy prescription departments would have to be cleaned up A glass partition should be used to shut out conversation in the drug store proper from interference with work That the drug store is still a *drug store* needs emphasis —W BRUCE PHILIP *J Am Pharm Assoc* 24 (1935) 224 (Z M C)

PHARMACOLOGY TOXICOLOGY AND THERAPEUTICS

PHARMACOLOGY

Acacia—Effect of Intravenous Injections of, on Physio-Chemical Properties of Blood The hemoglobin % and cell count decrease with the dilution of the blood following injections of acacia The oxygen content of the blood falls to a more marked degree This is probably due to a coating of the erythrocytes with acacia hindering normal cell respiration —A CHRISTIE N M PHATAK and M B OLNEY *Proc Soc Exptl Biol Med* 32 (1935), 670 (A E M)

Aconitum Napellus—Extract of Chemical Composition and Physiological Assay of Aconite The exact nature of the principles contained in the drug is not established with certainty although crystalline aconitine is accepted as the active principle By progressive hydrolysis of crystalline aconitine there is obtained first, benzoylaconine and acetic acid and then benzoic acid and aconine Aconitine is combined in the plant with aconitic acid, which is related to citric acid Because the alkaloid easily undergoes hydrolysis to form products much less toxic than aconitine one can easily see how the toxicity of the drug can vary widely, while the chemical determination may not reveal the change These facts necessitate a physiological assay for the drug and its preparations In addition to the uncertain chemical status of the drug geologic and climatic factors modify considerably the therapeutic value of the drug A comparison is made of the various physiological assays proposed from time to time The method developed by Goris is used in this paper The determination of the physiological activity of a dry extract of aconite containing about 0.5 per cent alkaloids soluble in ether is made in the following manner the dry extract is dissolved in 25 per cent alcohol to obtain a tincture and this is then diluted just before use to contain about 0.05 per cent alkaloids A volume such as will contain approximately 7 units of aconitine is then injected Thus for a 375 Gm pig 375×0.00000007 or 0.00002625 Gm is used and the tincture is diluted with physiological salt solution till each cubic centimeter represents 0.00002625 Gm of alkaloids If the animal does not die within six hours the dose is increased to 8 units etc until death is produced a new animal being used each time This dose is then injected into several animals and the exact value in units determined Two out of three animals must die within the time limit For the particular sample assayed the value was found to be 10 units The same drug from which the above extract was prepared was then percolated to prepare a tincture By a similar procedure its value was found to be 10 units The following

conclusion is then drawn the preparation of a dry extract, if the temperature is not allowed to go above 40° C, does not alter the alkaloidal strength of the preparation more than the preparation of a tincture by simple percolation A sample of our extract, shown chemically to contain 0.485 per cent alkaloids soluble in ether, was sent to Professor Tiffeneau for assay The results of his determinations when calculated to toxicity units also gave a value of 10 units By a comparison of the M L D of the tincture prepared and of crystalline aconitine, it is calculated that 65 per cent of the total alkaloids contained in the tincture was aconitine A comparison of this method with that of the U S P X and of the Spanish Phar is made —R FREUDWEILER *Pharm Acta Helv*, 10 (1935), 51 (M F W D)

6-Alkyl-Meta-Cresols—Oral Toxicity of The toxicity to rats upon oral administration of a complete series of 6 alkyl meta cresols from meta cresol through 6 decyl meta cresol was determined From a comparative study of the toxicity of 6 hexyl meta cresol with hexylresorcinol in animals and in man, the authors conclude that the former substance is no more toxic to man than hexylresorcinol and has been given orally to 100 individuals in doses up to 4.2 cc without symptoms or complaints —HAROLD W BROWN and PAUL D LAMSON *J Pharmacol & Exper Therap*, 53 (1935), 264 (H B H)

Alpha-Dinitrophenol—Some Effects of, on Pregnancy in White Rat Doses of 20 mg per Kg body weight given twice daily did not affect the pregnant rats in any way with the only exception, that the mortality of the young during the nursing period was increased —L M R WULFF, L A EMGE and F BRAVO *Proc Soc Exptl Biol Med*, 32 (1935), 678 (A E M)

Amidopyrine Inhibition of Leucogenic Activity in Rabbit by Certain Cyclic Compounds Rabbits respond readily with leucocytosis to treatment with nucleic acid Amidopyrine given for 18 days by mouth prevents such response Antipyrene, phenylhydrazine hydrochloride, o-quinone and catechol have the same effect Alpha dinitrophenol produces an initial stimulation followed by inhibition —DAVID R CLIMENKO *Proc Soc Exptl Biol Med*, 32 (1935), 823 (A C M)

Anesthetics, Local—Testing of, by Sciatic Nerve Block in Guinea Pig Sciatic nerve block has been added to the quantitative testing of local anesthetics on the intact and untreated guinea pig and the technique of the method is given Optimum injections were 0.2 cc in volume and analgesia was determined by light exploratory pinches of the skin Determinations were made on the following local anesthetics 1 dimethylamino 2 dimethylaminoethyl-2-butanol (alpyne) (I), γ -diethylaminopropyl ester of cinnamic acid (apothesine) (II), sulphate of γ -di-butylaminopropyl ester of *p* amino benzyl alcohol (butyn) (III), 2,2,6 trimethyl 4 piperidinol benzoate (β Eucaine) (IV), procaine (novocaine) (V), 2 butoxy-*N*-(β dimethylaminoethyl) cinchonamide (nupercaine) (VI) and 4 dimethyl amino 3 methyl-2 butanol (tutocaine) (VII) The relative durations of sciatic block at the concentrations 0.5, 1.0 and 2% were, respectively I 15, 12, 0.9, II 2.6, 1.4, 1.2, IV 1.8, 1.0, 1.5, III 5.6, 2.7, 2.0, VII 3.4, 1.9, 1.3, in terms of the figures obtained at the same concentrations with V taken as unity All save VI yielded results that were uncomplicated at these concentrations by local systemic or toxic effects The addition of 1:20,000 epinephrine to approximately threshold concentration of V and VII prolonged the analgesia about 10 and 24 times, respectively The advantages of the method are the small quantity of sample required, the distance of the area of cutaneous analgesia from the site of injection the fact that analgesia is complete in 1-3 minutes after injection and that the potency is measured by the duration of cutaneous analgesia The accuracy of the method is gaged by the ratios of the probable errors to their respective mean values the mean of 39 such ratios is 6.5% of the average periods of analgesia ranging from 10-200 minutes —L F SHACKELL *Anesthesia and Analgesia*, 14 (1935), 20, through *Squibb Abstract Bull*, 8 (1935), A-386

ApioI—Pharmacologic Tests of Slow intravenous injection of crystalline apioI (0.1-0.2 Gm per Kg) or liquid apioI, yellow or green (0.1 or 0.2 cc per Kg) in chloralosed dogs always caused marked hypotension and bradycardia, diminished the amplitude of auricular contractions and slowed up the ventricular beats Vagus section at the neck suppressed these reactions and a new injection of apioI had practically no effect on auricular or ventricular contractions or on arterial pressure Thus the effects of apioI were due to its action on the pneumogastric center However, the toxic effects occurred regardless of vagus section and death ensued due to heart failure Tests on suitable samples by the bromination method showed the following apioI titer for the various kinds crystalline (Merck) 96% crystalline (Rhône Poulenc) 75%, liquid

green 47% and liquid yellow 48% while the corresponding mortal doses in Gm per Kg intra venously in dogs were 0.5-0.75, 1-1.5, 1.8-2.2 and 0.25-0.40, respectively. Thus there was no close parallelism between theoretical apiol content and toxicity. Perhaps the chemical treatment for changing green apiol to yellow apiol gave rise to isomers that were more toxic than crystalline apiol.—F. MERCIER and L. VIGNOLI *Compt rend soc biol*, 118 (1935) 170, through *Squibb Abstract Bull*, 8 (1935), A 420

Apomorphine—Action of, upon Small Intestine in Non-anesthetized Dogs Apomorphine momentarily decreases the general tonus of the ileum and jejunum. Large doses increase the tonus. It may increase the peristaltic activity and at the same time decrease the tonus.—CHARLES M. GRUBER and JOHN T. BRUNDAGE *Proc Soc Exptl Biol Med*, 32 (1935), 863

(A E M)

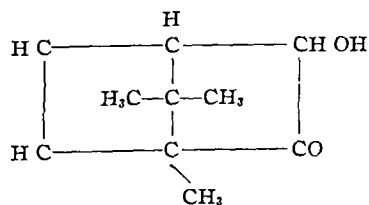
Aromatic Acids—Body Temperature Changes Produced by Sodium Salts of Some Sodium 3,5-dinitrosalicylate injected intramuscularly into pigeons and rats causes a decrease of body temperature of 2-4°. Sodium 3,5-dinitrobenzoate shows the same effect but less marked. Animals treated with antipyrine, sodium salicylate and benzoate showed variations of less than 2°.—R. K. BREWER and M. S. DOOLEY *Proc Soc Exptl Biol Med* 32 (1935) 778 (A E M)

Ascorbic Acid—Influence of, on Sensitization of Guinea Pigs to Neoarsphenamine Ascorbic acid prevents sensitization to neoarsphenamine. The minimum dose is decidedly higher than that which protects against scurvy.—M. B. SULZBERGER and B. L. OSER *Proc Soc Exptl Biol Med* 32 (1935) 716 (A E M)

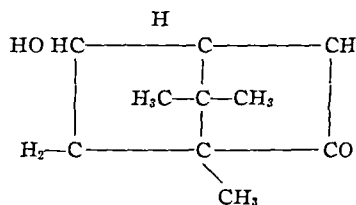
Barbiturates—Sex Difference in White Rat in Tolerance to Certain The female rat is more sensitive than the male for amytal, nembutal, evipan, pernocton and hebaral or ortal. No difference was found with barbital and phenobarbital.—H. G. O. HOLCK and M. A. KANAN *Proc Soc Exptl Biol Med* 32 (1935) 700 (A E M)

Caffeine Per Se and Caffeine Beverage—Effect of, on Reaction Time in Young Adults The effect of coffee and of caffeine was studied upon the reaction time of ten subjects. It was found that coffee containing an equivalent amount of caffeine produced parallel results to caffeine administered in capsules but to a lesser degree in most individuals. Twenty-four hours after the administration of caffeine either as such or in the form of coffee in amounts of from 2.9 to 5.6 mg X Kg, no significant effect could be noted upon the reaction time.—RALPH H. CHENEY *J Pharmacol & Exper Therap* 53 (1935) 304 (H B H)

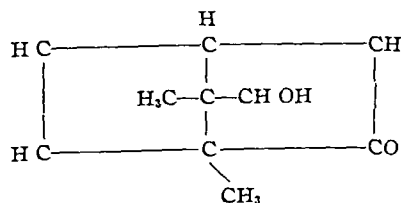
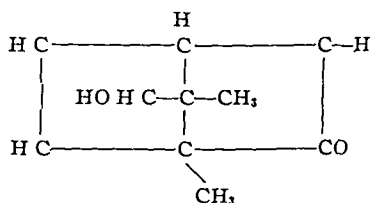
Camphors and Diketone-Camphanes—Degradation of, in Animals From the urine of dogs poisoned with camphor, Asahina and Ishidate isolated the following oxy camphors:



3 Oxy-camphor

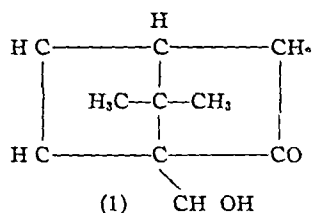


5 Oxy camphor

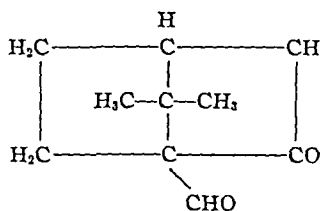
Cis π oxy-camphorTrans τ oxy-camphor

According to Tamura such degradation of camphor in animals that is their oxidation is important pharmacologically. There is a positive inotropic reaction on normal frog hearts but

the reaction is not evident at the time of application, but only after a lapse of time. This fact explains the formation of potent products of metabolism of camphor. Dilute solutions are not active immediately after application. The pharmacological tests made of pure oxy camphor have so far no support in the theory given by Tamura. The same holds true for the higher oxidizable substances (aldehydes, acids, ketones). Vita Camphor (a mixture of 5 oxy camphor and oxo camphor) and oxo-camphor in a higher grade of purity have no cardiac reaction. A cardiac stimulation in frog hearts according to Takebe, is possible due to 10 oxy camphor. But 10 oxy camphor (1), has not been found in the urine. The crude mixture of oxy camphor on the



or



addition of potassium hydroxide and on great dilution shows a typical camphor effect. With a 1:20,000 solution the pulse beat is fast and then gradually sinks. With bisulphate of lye the free vita camphor shows weak but constant cardiac reactions; this fact is not true when using synthetic products. These results led to more search of degradation products of camphor in urine. Boiling *p*-diketone camphor with chromium trioxide then with oxygen and alkali, finally with toluene, *p*-nitro benzoyl chloride and pyridine, a quantity of nitrobenzoates with a melting point of 120.5–122° was obtained. Upon analysis oxy-4-camphor nitro benzoate was found to be the product of the reaction. If potassium permanganate were used in place of oxygen the result would be a material of the formula $\text{C}_{10}\text{H}_{10}\text{O}$ with a melting point of 131–132.5°, which may produce more degradation products. It is evident that more products of metabolism of camphor can be found in urine. There is a transition of camphor ring to cyclo camphane ring in animals. *p*-Diketo camphane and cyclo camphane both form into oxy-cyclo camphane. Both acids have the same formula $\text{C}_{10}\text{H}_{10}\text{O}_3$, melting point acidity crystallization fashion and semi-carbazones — F. REINARTZ, W. ZANKE and M. KÜRSCHGEN, *Ber.* 68 (1935), 310 (G. B.)

Cinchona Alkaloids—Value of, in Pneumonia. **Miscellaneous Alkaloids and Some Hydrocupreine Ethers.** This paper is a preliminary study of a number of naturally occurring cinchona alkaloids, their hydrogenated derivatives and some artificially prepared alkaloids with reference to their pneumococcicidal activity, toxicity and protective ability. Hydroxyethylhydrocupreine, an alkaloid prepared by the writers, proved to be far less toxic to mice than optochin, and was highly efficient in protecting them against pneumococcal infection — C. L. BUTLER, W. L. NELSON, A. G. RENFREW and L. H. CRETCHER, *J. Am. Chem. Soc.* 57 (1935), 575 (E. B. S.)

Diodotyrosin—In Vivo Action of. **I. Diuretic Action.** Diodotyrosin was shown to be an extra renal diuretic in rabbits. The German abstract in the *J. Ph. Soc. Japan* should be consulted for details of experimental conditions and results — A. OGATA and T. TANAKA, *J. Pharm. Soc. Japan* 55 (1935), 14 to 18 (R. E. K.)

Ephedrine after Digitalis—Cardiac Irregularities Produced by. The authors employed dogs and administered ephedrine and digitalis intravenously, studying the effects upon the heart by means of electrocardiographic tracings. It was found that digitalis greatly prolonged the duration of arrhythmias produced by ephedrine; in some instances cardiac irregularities were brought about by the simultaneous administration of both drugs which had not occurred when either drug was used singularly. Digitalis tended to increase the number of ventricular irregularities due to ephedrine. No fatalities were recorded from the use of these ephedrine digitalis combinations in amounts allowing of clinical comparison although weakness and prostration and arrhythmias of a serious nature were observed — M. H. SEEVERA and W. J. MEEK, *J. Pharmacol. & Exper. Therap.* 53 (1935), 295 (H. B. H.)

Ergot Alkaloids—Effect of, on the Uterus. The authors review the use of ergot including a test for determining the biological potency of ergot and its various constituents by determinations of uterine motility of human patients from the sixth–eighth post partum day. A new substance, water soluble and representing 10% of the crude extract was isolated from ergot, sepa-

rated from an active powder that contained all the activity of the original ergot. Separation of the alkaloids left the oxytocic activity in the non alkaloid fraction. Since the active fraction was not alkaloidal, the human uterine method was used to determine activity. The new active principle is soluble in most hydrophylic solvents and relatively stable to heat, is agreeable and palatable, the dose is small and may be dissolved in 3 cc or less of fluid and produces no gastro-intestinal or other undesirable effects. It does not affect the pulse or blood pressure and when given orally the response is usually obtained in 6-15 minutes. The whole curve is characteristic of a good response obtained from an active ergot preparation. No general response appears after the use of pituitrin. The usual dosage is 3 mg in solid form, capsules or solutions and uniform uterine motility and tone which persists for 3-4 hours are obtained. No evidence of undesirable reactions has been noted in doses 3-4 times the effective one. The authors conclude that clinically, the new principle is suitable for administration whenever the oxytocic activity of ergot is desirable. The new active principle was used in over 100 post partum patients, giving a good characteristic response while the active alkaloids in ergot, ergotamine, ergotoxine and sensibamine, given to patients orally in 3 mg doses gave no uterine responses within an hour.—M E DAVIS *et al* *Am J Obstet Gynecol*, 29 (1935) 155, through *Squibb Abstract Bull*, 8 (1935) A 327

Eserine and Acetylcholine—Effects of, on Gastro-intestinal Motility in Normal Dogs Dogs were injected during ether anesthesia intramuscularly with eserine and eserine plus acetylcholine. One mg of eserine or less did not regularly produce peristalsis of stomach, ileum and colon. When 0.025 mg of acetylcholine was added peristalsis resulted almost instantly. Intramuscular injections of larger amounts, 2-3 mg of eserine induced general intestinal motility but undesirable by effects also.—R FRANK L ZIMMERMAN and H NECHELES *Proc Soc Exptl Biol Med*, 32 (1935), 686 (A E M)

Galinsoga—Pharmacology of Report is made of experiments undertaken to extend our knowledge of the pharmacology of Galinsoga and to investigate the oxygen consumption by tissues. One and two per cent infusions caused an increase in oxygen consumption by heart tissue but it was not proportional to concentration. The principle or principles are apparently not extracted with cold water and they seem to be destroyed as the infusion ages. Inulin, levulose and dextrose have little influence on oxygen consumption and saponin causes a slight inhibition. Infusion of digitalis seems to contain a principle which causes an increase in oxygen consumption. These experiments suggest the possibility of using a micro respirometer for a number of investigations.—M A YAVORSKY and E C REIF *J Am Pharm Assoc* 24 (1935), 108 (Z M C)

Insulin Preparations—Evaluation of A review of several physiological methods and one chemical method of evaluating insulin. The chemical method is based upon the fact that insulin increases the concentration of copper oxide reducing substances in the urine.—O KAUSCH *Pharm Ztg*, 80 (1935), 246 (G E C)

Liver—Anti-anemia Potency of, after Gastrectomy in Swine The anti-anemic potency of the liver becomes progressively depleted after gastrectomy.—L GOODMAN, A J GEIGER and L N CLAIBORN *Proc Soc Exptl Biol Med*, 32 (1935), 810 (A E M)

Parasympathetic Drugs—Intestinal Motor Inhibition by Strips from different parts of the intestinal tract contracted by acetylcholine or physostigmine are relaxed by pilocarpine. Contraction produced by pilocarpine is reversed by acetylcholine only in a minority of the trials.—F D MCCREA and DONALD F MARION *Proc Soc Exptl Biol Med* 32 (1935) 876 (A E M)

Phosphated Iodotannic Syrup—Antirachitic Action of The iodotannic syrup of the French Pharmacopœia does not attenuate the antirachitic efficacy of even minimal effective doses of calcium hydrogen phosphate. The authors believe that the antirachitic action attributed to iodotannic combinations is nil provided that free iodine is not present in the preparation. Phosphated iodotannic syrup proved to be very efficacious as an antirachitic preparation.—R GALLIER *Bull sci pharmacol* 42 (1935) 31 (C T I)

Phosphorus—Peculiar Action of, in Treatment of Rickets White phosphorus administered in a warm 1% oil solution to white rats, deprived of vitamin D and receiving a large excess of calcium as compared to phosphorus, exhibited no rachitic action. The oil of almonds and apricots used as solvent were tested individually, and showed no effect.—R LECOQ and R GALLIER *J pharm chim* 21 (1935) 211 (M M 7)

Quinine, Quinidine, Hydroquinidine and Hydrocinchonidine—Toxicity of, in Guinea Pig The lethal dose for about 50% of the animals used in the test is for quinine 0.6 mg. mol. per Kg., for quinidine 0.4, for hydroquinidine 0.4 and for hydrocinchonidine 0.7 —W T DAWSON and H P HARMS *Proc Soc Exptl Biol Med*, 32 (1935), 595 (A E M)

Rabies—Experimental, in White Mice and Attempted Chemotherapy II Plasmochin merthiolate, metaphen, bismuth violet, iodobismutol, bismarsen, tryparsamide, silver arsphenamine, Bayer 205, ethylhydrocupreine hydrochloride (optochin), pyridium, sodium arsinitate (atovyl), neostam and sparteine sulphate were used as treatment for rabies in mice with none showing therapeutic value —ANSON HOYT, ROY T FISK and CLINTON H THIENES *J Inf Dis*, 56 (1935), 21 (A H B)

Sedatives Types, Uses and Dangers The types of sedatives are those which manifest their major effect in the mitigation of discomfort or pain arising on a bodily basis, e g, morphine, codeine, acetylsalicylic acid, sodium salicylate, acetanilide, p acetophenatide and amidopyrine, those which tend to reduce excessive degrees of muscular activity not associated with pain and which do not, in the usual dosage, produce sleep, e g, 5 ethyl-5 phenyl barbituric acid (luminal), hyoscine, hydrobromide and stramonium, and those effective in controlling states of excessive mental tension which in the proper dose, will produce sleep, e g, codeine sulphate, the bromides, chloral hydrate, paraldehyde, alcohol and the numerous barbituric acid derivatives Sedatives should not be used in conditions of acute intra abdominal pathology, in which the administration of a sedative might mask the signs of the disease, and the question should be carefully considered in cases of neuroses in which somatic complaints are prominent The choice of sedative depends upon the indications As a class the sedative drugs act as central nervous system depressants The chief dangers from sedatives result from their temporary use in excessive amounts, their use over too long periods of time and their administration in an unfavorable milieu peculiar to the individual, e g, allergic and hypersensitivity reactions and habituation to the drug —G H ALEXANDER *Am J Nursing* 35 (1935), 222 through *Squibb Abstract Bull*, 8 (1935), A-449

Sodium Amytal—Effects of, on Erythrocyte Count following Hemorrhage The capillary and venous blood in the dog is immediately diluted after a single hemorrhage performed under local anesthesia The dilution is absent when the hemorrhage is performed under general anesthesia by intravenous sodium amytal There may even be a concentration of blood As soon as the anesthesia wears off dilution promptly appears —R ELMAN, D O WEINER and W H COLE *Proc Soc Exptl Biol Med*, 32 (1935), 793 (A E M)

Squill—Bioassay of Powders of The present study reveals the method of preparation, of preservation and of standardization and also the stability of a standard squill powder The standard is prepared by placing cut scales of a composite lot of squill on a mincing plate and dried by (1) keeping the drug in a hot air oven at 60° for three days or (2) in the open at 25–30° for a period of seven days In the course of desiccation the drug should be mixed frequently The powder is passed next through a No 45 sieve, dried for several hours at 60° and then sealed in ampuls A powder containing 4–5% moisture is stable for at least one year Drying squill by heaping it in a pile and not stirring or mixing results in a fermentation which causes a partial destruction of the glycosides The method of assay is carried out on the dog (cf *Year Book, Am Pharm Assoc*, 22 (1933) 131) The authors propose that the official powder have a M L D of 40 mg /Kg of dog as determined by the above mentioned assay procedure —M MASCRE, J LÉVI and R COHEN *Bull sci pharmacol* 42 (1935) 66 (C T I)

Thallium—Action of, in Experimental Animals No support could be found to the claims that thallium intoxication is characterized by alterations of the endocrine function —A J COX, JR, and E B RODGERSON *Proc Soc Exptl Biol Med* 32 (1935), 653 (A E M)

Thioaurates—Contribution to Physiologic Testing of Aurothiosulphates of sodium and calcium, calcium aurothioglucose, aurothiopropansulphonate of sodium aurothiomalate of sodium and aurothiolactate of sodium were injected into guinea pigs and rabbits After 48 hours the animals were sacrificed and the different amounts of compounds were recovered from the various organs An oil solution of the quinine salts is retained for the most part, in the muscles in the area injected and distinct local reaction is produced This reaction is much less with the other compounds, and no noticeable amounts were retained in the muscles If the fatty tissue or bones did not retain most of the metal compound then the uterus or placenta was found to be rich in the compound The metal accumulates especially in the liver kidney and spleen Strong doses usually brought

about a larger retention of metal in the kidney —M M PICON *J pharm chim* 21 (1935), 215 (M M Z)

Thymus and Pineal Extracts—Biological Effects of Active Thymus extracts produced acceleration in growth and development which was accelerated in each succeeding generation. Removal of the thymus gland resulted in retardation of growth and development of the offspring, even in the second generation of rats and this retardation was not apparent in the offspring of thymectomized rats when the parents had been injected with thymus extract or subjected to thymus transplants. The author assumes from the above that the active principle in thymus extract is a hormone. In a study of pineal extracts two were found to produce dwarfism in variably when injected intra-peritoneally into white rats but the same step like progression was not found. Dwarfism seemed no more marked in the 4th generation than in the 3rd —A M HANSON *Proc Staff Meetings Mayo Clinic*, 10 (1935), 113, through *Squibb Abstract Bull*, 8 (1935), A-453

Vitamin C—Influence of, on Development of Skin Sensitivity to Neoarsphenamine in Guinea Pig Skin sensitivity is not developed in animals suffering from subacute scurvy. Dextrose seems to have a protective effect —C W CHAPMAN and C A MORRELL *Proc Soc Exptl Biol Med*, 32 (1935) 813 (A E M)

TOXICOLOGY

Balsam of Peru—Hypersensitivity of Skin to It is estimated that 2% of the individuals who have never used any ointments have a skin supersensitive to Peru balsam and the numerous preparations containing this balsam while 5 times as many are hypersensitive if they have previously used various ointments. This hypersensitivity which is characterized by eczema etc is absolutely specific. A patch test is advised before the use of Peru balsam ointments, especially where the individual has been undergoing prolonged treatment or where a chronic eczema is present —W ENGLEHARDT *Munch med Wochschr*, 82 (1935) 256 through *Squibb Abstract Bull* 8 (1935), A 319

Boric Acid-Containing Fat-Reducers Two preparations of the urea-boric acid type, although labeled as harmless were found to produce severe pains in the occiput, stomachache and nausea. Strict supervision of the sale of boric acid containing reducing agents is recommended. Completely harmless active substitutes for the above will be discussed in a future report —SCHENK *Pharm Ztg* 80 (1935) 136 (G E C)

Dinitrophenol—Case of Poisoning by, with Recovery A case report of an 18 year-old girl who had taken 24 reducing capsules with suicidal intent. The patient's face was flushed, the respiration rate was 38 to 40 per minute, rapid and short, pulse 144 and the temperature was 103.4° F. Routine gastric lavage was done with a 5% solution of sodium bicarbonate. The symptoms being those associated with an overdose of alpha dinitrophenol the patient was placed in an ice pack in order to bring down the temperature. This was repeated whenever the temperature went over 101° F. Oxygen was administered at intervals during the first evening and 500 cc of dextrose was administered intravenously. The patient slept at intervals during the first night and the next night she complained of being hungry but vomited after taking some food. Her condition was much improved the second day. She took fluids freely, retained them and felt very much better. Recovery continued uneventfully and the patient was discharged on the third day. The patient in describing her symptoms afterward stated that during the entire time she felt as if she were on fire. At no time was consciousness lost and there was little or no pain evident during her stay at the hospital. Dinitrophenol was found in the gastric contents on laboratory examination —J C GEIGER *J Am Med Assoc* 104 (1935) 915 (M R THOMPSON)

Gold—Toxicity of Injections of After injections there are no warning symptoms until some days after 11 injections when dermatitis and very intense irritation and slight ulceration of the mouth occur. These symptoms although no further injections were made failed to clear up entirely. Further the rheumatism for which these treatments were administered failed to show any improvement —G HOLMES *Brit Med J* 1 (1935) 58 (W H H)

Mercury Bichloride—Treatment of Poisoning by While there is as yet no known specific antidote for corrosive sublimate poisoning W B Porter and C E Simons (*Amer J Med Sci* 188 (Sept 1934) 375) report a series of forty six cases in which some measure of success resulted

from a therapeutic scheme comprising gastric lavage and colonic irrigation by a solution of sodium bicarbonate and an internal administration of the salt in a dosage sufficient to maintain the urine alkaline to litmus. There were only three deaths. For the gastric lavage a saturated solution was used at a temperature of 100° F, repeated every 12 hours for the first five days, and continued still longer if the washings contained mercury. An intravenous injection of 500 cc of a 5 per cent solution was given after the lavage and repeated if vomiting persisted. A colonic irrigation of 5 per cent solution was given daily.—*Brit Med J*, 3868 (1935), 400b (W H H)

Methyl Chloride Poisoning The symptoms and degree of poisoning are thoroughly discussed along with the citation of numerous cases and their treatments.—C A BIRCH *Lancet*, 228 (1935), 259 (W H H)

Methylene Blue—Therapeutic Use of, in Phenol Poisoning The case is reported of a patient apparently in distress as a result of having drunk phenol. The patient recovered following successive aspiration of the stomach and lavage with saline, diluted egg albumin and 50% alcohol, respectively, administration of caffeine and adrenaline as stimulants, intravenous injection of glucose and saline, and the intravenous injection of 40 cc of a 1% solution of methylene blue. It is suggested that the methylene blue may have influenced the favorable outcome.—W M SHEPPE *Military Surgeon* 76 (1935), 30, through *Squibb Abstract Bull*, 8 (1935), A-229

Nitro Compounds—Toxicity of A review of the toxic phenomena which have been observed experimentally and clinically by numerous authors upon the use of 2,4 dinitrophenol and o cresol and similar dinitro compounds. Up to the present time, six deaths have been reported as due directly to the use of 2,4-dinitrophenol for reducing purposes. The British Pharmacopœia has recently added dinitrophenols, dinitrocresols and preparations containing these to its lists of poisons.—H STRAUB *Altn Wochschr*, 14 (1935) 185 through *Squibb Abstract Bull*, 8 (1935) A 367

Phenol—Dermatitis Due to In a case of dermatitis in which the hands of an interne were involved in a vesiculo pustular, erythematous eruption, treatment with an ointment containing 2 Gm crude tar, 2 Gm zinc oxide and 26 Gm petrolatum improved the condition of the left hand greatly during twenty-four hours. Treatment of the right hand with phenyl mercuric nitrate (I), 1 1500 jelly was followed by a marked vesicular reaction. Since previous eruptions were precipitated in the dissecting room and in the operating room the conclusion was drawn that contact dermatitis existed. Treatment of the left hand with the tar ointment and the right hand with the boric acid compresses was followed by marked improvement, but a skin test with I was markedly positive. Various dilutions of phenol in aqueous solution from 1 100,000 to 1 1500 were applied to the arm and patch tests were made with the disodium salt of 2,7-dibromo 4 hydroxymercurifluo rescein (mercurochrome) with negative results. Patch tests with phenol containing vaseline were positive. Recurrences of the dermatitis followed on two occasions when phenol was used.—L HOLANDER *Urol Cutan Rev*, 39 (1935) 165, through *Squibb Abstract Bull* 8 (1935), A 369

Poison Cases—Concerning Important Of 372 cases appearing before the Gerichtlichen-Chemischen Institute of Budapest in criminal affairs in 1934, 85 dealt with new and exhumed cadavers, 32 drugs, 18 food residues and 237 different objects of examination. Chemical examination in 178 cases gave positive results including 35 cadavers, 27 drugs, 7 food residues and 109 different bits of evidence. The cadavers studied showed the following: arsenic 15, chromium 1, zinc 1, bromine 1, iodine 1, alcohol 2, oxalic acid 1, morphine 3, cocaine 1, atropine 1, quinine 1, pyramidon 1, pyramidon and veronal 1, evipan 1, veronal 2 and carbon monoxide 1. Special poison cases are discussed.—R FRIDL *Pharm Monatsh*, 16 (1935) 31-32 (H M B)

Poisonings—Native, in the Dutch Indies Of poisonings in the Dutch Indies, 55% are by arsenic or its compounds, and 9% by decoctions of plants containing alkaloids, saponins, glucosides, toxalbumins, etc. Potassium cyanide is another frequent source of poisonings.—C J BLOCK *Aan P van der Wælen* (1934), 139-147 through *Chimie & Industrie*, 33 (1935) 626 (A P-C)

Sodium Nitrite—Value of, as Antidote to Hydrogen Sulphide Sodium nitrite exerts a marked preventive and curative effect on hydrogen sulphide poisoning when administered either before or after the hydrogen sulphide. The antidotal action, demonstrated in mice, is due to the production of methemoglobin which fixes the toxic substance.—V KARRASSIK and V CHELOKHANOWA *Compt rend soc biol* 118 (1935) 23, through *Squibb Abstract Bull*, 8 (1935) A-435

Strychnine—Poisoning of Children by The chief source of strychnine poisoning in children was from tablets containing aloin 0.5 gr and extract of belladonna $\frac{1}{16}$ gr, strychnine $\frac{1}{4}$ gr and extract of cascara sagrada 0.5 gr. Since there were 35 cases of strychnine poisoning in children reported from 1919 to 1933 in Toronto, and 75 fatal poisonings with strychnine in New York State during 1925–1932, the authors conclude that it would be advisable to remove strychnine from the formulas of such tablets.—J. R. Ross and A. Brown *Can Med Assoc J*, 32 (1935) 282 through *Squibb Abstract Bull* 8 (1935) A-451

THERAPEUTICS

Acetylcholine—Value of, in Ophthalmology J. Francois (*Nederl Tijdschr v Geneesk* (Dec 1934), 5632) states that numerous ophthalmologists have emphasized the value of the baso dilator acetylcholine in obstruction of the central artery of the retina resulting from end arteritis or essential vascular spasm in quinine anraurosis, optic atrophy, retrobulbar neuritis, thrombosis of the central vein of the retina, blindness due to loss of blood and chronic glaucoma. Acetylcholine may also be of value in visual disturbance caused by changes in the cerebral circulation such as scintillating scotoma, hemianopia or cerebral blindness. Considerable improvement follows intramuscular injections of acetylcholine in 20 cg doses daily.—*Brit Med J* 1 (1935) 400c (W. H. H.)

Anesthetic—New From his experience in 1200 cases E. de Meuson (*Rev Med de la Suisse Romande* (August 25 1934) 856) advocates as an anesthetic a mixture of scopalamine, eukodal and ephetonin. This is prepared by Merck in ampuls containing 0.005 Gm, 0.01 Gm and 0.025 Gm of each drug respectively. Ephetonin, synthetically obtained from ephedrine, is an excitant of the respiratory centre, and thus counteracts the paralyzing action of this centre of scopalamine and eukodal. On the eve of the operation 0.05 Gm veronal is given orally and repeated three hours before the operation. Two ampuls of the anesthetic mixture are injected subcutaneously an hour and a half and one ampul three quarters of an hour before the intervention. This anesthetic should be used prudently in cases of grave renal lesions, it is especially indicated when inhalation anesthetic might be dangerous, as in pulmonary tuberculosis and cardiac affections.—*Brit Med J* 1 (1935) 138c (W. H. H.)

Arsanilic Acid, N-(p-Dimethylaminobenzal)—Chemotherapeutic Testing of Fischl and Singer tested the therapeutic action of N-(p-dimethylaminobenzal) arsanilic acid (I) (arsenic yellow) and N-(2,4,6-trihydroxybenzal) arsanilic acid (II) (arsenic brown) against nagana and European recurrent fever in mice. The curative doses of I and II against nagana in Gm per 20 Gm of mouse intramuscularly were $\frac{1}{180}$ and $\frac{1}{200}$ respectively and the toxic doses were $\frac{1}{30}$ and $\frac{1}{35}$ respectively, the therapeutic indexes being 1.5 and 1.4 respectively. I had no curative action against recurrent fever but the curative dose of II was $\frac{1}{10}$ and the index 1.1. No toxic dose was recorded.—Viktor Fischl and Ernst Singer *Biochem Z* 276 (1935) 277, through *Squibb Abstract Bull* 8 (1935) A-420

Chemotherapy—Biological Problems in It was found that the aromatic pentavalent arsenical and antimonial compounds are but slightly trypanocidal, a solution of about 1:1000 being required to destroy the parasites within 24 hours at 37° C. The corresponding trivalent compounds are however amazingly trypanocidal as even when diluted a hundred million times they killed the trypanosomes within 24 hours. This is also true of the arsenobenzol compounds such as novarsenobillon. The non aromatic trivalent compounds sodium arsenite and tartar emetic likewise display considerable activity, their trypanocidal titers being respectively 1:3,200,000 and 1:6,400,000. The acridine dye acriflavine is highly trypanocidal but Bayer 205 resembles the pentavalent arsenical compounds in exhibiting practically no trypanocidal action *in vitro*.—W. Yorke *Lancet*, 228 (1935) 191 (W. H. H.)

Copper, Colloidal—Value of, in Septicæmia. L. M. Reinhold (*These de Paris*, 1934, No 766) records ten cases of streptococcal or staphylococcal septicæmia in patients aged from 12 to 27 treated by intravenous injections of colloidal copper. The injections should be given in doses ranging from 5 to 20 cc daily, repeated every day or every two days. These injections should be continued for four or five days after the temperature has fallen, so that the total duration of treatment is about ten days. The cases treated were acute osteomyelitis and puerperal fever.—*Brit Med J* 1 (1935), 60 (W. H. H.)

Curarine—Case of Tetanus Treated with It appears that curarine is generally accepted

as the most suitable alkaloid of its group for the use in the treatment of tetanus After the injection of curarine there is a decrease in the muscle tone and there appeared to be no undesirable effects—J S MITCHELL *Lancet*, 228 (1935), 262 (W H H)

Garlic and Its Preparations Garlic is used in affections of the respiratory tract and in hypertension A tincture prepared by extraction with 80% alcohol, or an extract prepared with a hydroalcoholic menstruum (1 1 or 1 2 with 95% alcohol) is used A juice may be prepared from 800 Gm garlic with 200 cc alcohol and 1000 cc water A solution of the garlic essence (2%) in olive oil can be used hypodermically In bronchitis, the following formula is recommended Garlic essence 0.5–2%, gomenol 10–20% a mixture of equal parts of camphor with guaiacol 5–10% olive oil to make 100 cc—ALFREDO J BANDONI *Rev farm* (Buenos Aires), 77 (1935) 25 (A E M)

Gold Salts—Value of, in Disseminated Sclerosis G Dubois-Andre (*Le Scalpel*, Oct 27 (1934), 1517) records three cases of disseminated sclerosis treated by auro thio glucose in oily suspension, when good results were obtained despite previous failures with other lines of treatment He believes that the injections act by arresting the new formation of neuroglia, thus preventing the progressive destruction of myelin and safeguarding the nerve cells and fibres from the menace of fibrotic strangulation The maximum dose is 30 cg repeated twice at an interval of ten days The initial dose is small—5 cg, injected once a week, this is repeated before a higher dose is tried and the same principle is observed throughout the course of treatment—*Brit Med J* 1 (1935), 2886 (W H H)

Insulin—Value of, in Toxic Diphtheria Antitoxin intravenously and intramuscularly and dextrose intravenously and by mouth are accepted as the basis of treatment in toxic diphtheria In diphtheria the response of the body to intravenous dextrose is constantly abnormal and results in higher blood sugar findings The degree of variation is a sensitive index to the severity of the attack and serves as a reliable guide to the progress of the disease A fairly close association appears to exist between abnormalities in tolerance curves and involvements of the cardiovascular mechanism How much the former depends upon the latter it is impossible to say from this investigation Insulin does not appear to change the character of the abnormal curves nor to influence the course of the disease as judged by the fatality and complication rates—N D BEGG *Lancet* 228 (1935) 480 (W H H)

Iodine, Colloidal—Use of, in Medicines and Cosmetics The use of colloidal iodine in medicines and in cosmetics as a scalp remedy in soaps, toothpastes and creams is discussed—O E OSTBERG *Drug and Cosmetic Ind* 36 (1935) 423–424 (H M B)

Methylene Blue—Direct Action of, on Hansen Bacillus Intravenous injections of 1% methylene blue solutions in doses of 20 cc are retained by leprosy tissue and exercise a direct *in vivo* action on the Hansen bacillus which shows progressive microscopic changes characteristic of degeneration, e g, granular appearance polymorphism followed by cyanophilia A number of cases of leprosy are undergoing treatment with methylene blue solutions One case described showed progressive and rapid amelioration of the lesions, many of which were completely eliminated after 25 injections—P LEPINE and J MARKIANOS *Compt rend soc biol* 118 (1935) 9 through *Squibb Abstract Bull* 8 (1935) A-440

Oestrin—Treatment of Vulvo-Vaginitis with The main features of the treatment are (1) that it is shorter than other methods (2) it is easy of application as the drug can be given by mouth, and (3) it quickly diminishes the discharge and thereby reduces the infectivity of the patient and the risk of spreading the disease—D NABARM and A G SIGNY *Lancet*, 228 (1935), 604 (W H H)

Ophthalmic Therapeutics A classification of substances used in daily routine for treatment of eye injuries burns, infections, etc For instance, castor oil or liquid petrolatum is used to decrease the irritation of a foreign body—or to help to remove it by floating it out Fluorescein is used for its staining properties as an aid to diagnosis as it stains only such parts of the eye surface as are denuded of their epithelium, and is of value in showing the extent of injury or ulceration Methylene blue is also used for its staining properties Substances used for their direct chemical action include 1–2% solutions of sodium bicarbonate (to neutralize acid burns) boric acid or very dilute acetic acid (in alkaline burns) and 10% neutral ammonium tartrate (in lime burns) Copying ink pencil—an aniline derivative—acts as a caustic in the eye and can be dissolved out with glycerin—or its activity may be restricted by using weak tannic acid (5%)

Antiseptics for the eye can be applied in many forms. For instance lotions, as follows: saline, boric acid, sodium bicarbonate, flavine, mercury bimodide, zinc sulphate, potassium permanganate, drops as (a) the silver group—silver nitrate, argyrol, protargol, neoprotosil, collosol argentinum, (b) zinc sulphate, collosol zinc, (c) copper sulphate, (d) mercuriochrome. Powders to be dusted inside the lids—in a very fine state of subdivision: calomel, iodoform, boric acid. Ointments such as yellow mercuric oxide, zinc oxide, staniform, neoprotosil, copper sulphate and trachomian ointment. The mydriatics such as atropine, homatropine, etc. act on the iris in such a way that the pupil tends to dilate. The myotics, eserine and pilocarpine, contract the pupil and help to reduce intraocular tension.—D L CHARTERS *Pharm J*, 134 (1935) 213 (W B B)

Parathyroid Tetany—Treatment of While Collip's parathormone is active in raising the level of the serum calcium and relieving the symptoms of parathyroid tetany, it is not satisfactory unless injected in large and repeated doses. It is also expensive. In most cases, therefore, it is impracticable to employ it. The intravenous administration of 10 cc of a 10% solution of calcium chloride produces relief of symptoms in a few minutes lasting for about a day and a half. It is an excellent emergency measure. While injecting a solution of this strength, care must be taken that none of it escapes into the subcutaneous tissue, for necrosis of tissue and ulceration may result. A good method of treatment is to present continuously to the bowel a large amount of calcium in the form of calcium chloride (150 gr daily). In cases where this is not effective, 50 to 100 cc of N/3 hydrochloric acid should be given to increase the absorption of calcium. This acid is given in milk in the proportion of 1 to 20 of milk.—D CAMPBELL *Lancet* 228 (1935) 369 (W H H)

Quinidine Sulphate—Evaluation of Use of, in Persistent Auricular Fibrillation A study of 49 cases of auricular fibrillation in which 46 were classified as permanent and 3 as transient, treated with quinidine sulphate, showed that normal rhythm was restored in 35 or 71.4% of the cases. Of 33 cases with adequate follow-up notes, only 17 or 51% remained regular over 1 year. Two tenths gram of quinidine sulphate was given orally as a test dose the following day. 0.3 Gm was administered 3 times and each day the dose was increased 0.1 Gm until the rhythm became regular when the patient was placed on a maintenance dose. Rheumatic valvular disease is most resistant. Non-valvular fibrillation responds more readily and in cases of hyperthyroidism without cardiovascular disease treated post-operatively, reversion to normal rhythm is practically invariable. Duration of fibrillation influences to some extent the likelihood of reversion; cases with a short history reverting more readily. It is doubtful whether most cases are in better health with a regular rhythm than with auricular fibrillation when the ventricular rate can be kept slow. There is no method of predicting fatal results with quinidine therapy. The presence of fibrillation and increasing years are both separate factors favoring auricular mural thrombosis. The four indications for the use of quinidine sulphate seem to be: the presence of fibrillation in an otherwise normal heart; its persistence after operation for hyperthyroidism, when the irregularity is the cause of intractable palpitation; and in certain hopeless cases where other forms of treatment have failed. Contraindications are an idiosyncrasy to quinine and a previous history of embolism, badly damaged hearts, marked cardiac hypertrophy and long-standing fibrillation, etc.—C M KOHN and S A LEVINE *Ann Internal Med*, 8 (1935) 923, through *Squibb Abstract Bull*, 8 (1935), A-447

Strophanthin—Value of, in Angina Pectoris E Edens (*Munch med Woch* (Sept 14 1934) 1424) believes that angina pectoris is most commonly due to anemia of the heart following increased irritability and spasm of the coronary blood vessels. He has given strophanthin—0.3 mg strophanthin is given daily (in severe cases twice daily) for three days with an interval of one day. The attacks became less frequent and less painful and stopped altogether in a short time. He also states that intravenous injection is better than intramuscular or oral administration.—*Brit Med J* 1 (1935) 138c (W H H)

NEW REMEDIES

SYNTHETICS

Alkoxybenzamides—Substituted N,N-Dimethyl (or diethyl) di (or -tri) methoxy (or -ethoxy) benzamides are prepared by standard processes, e.g., from the alkoxybenzoyl halides and dimethyl amine or diethyl amine. Examples are given of the preparation of veratric acid

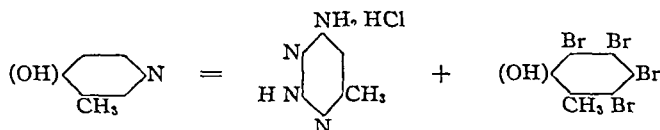
dimethylamide, b_1 203° melts at 102–103°, and diethylamide, b_{12} 205°, *N,N* dimethyl 3,4,5 trimethoxybenzamide, b_{13} 218°, melts at 74°, *N,N* diethyl 3,4,5 trimethoxybenzamide, b_{13} 220–226° melts at 54°, *N,N* dimethyl 2,3 dimethoxybenzamide, b_{12} 172°, *N,N* diethyl 3 methoxy 4,5 diethoxybenzamide, b_{12} 211–212°, *N,N* diethyl 3,5 dimethoxy-4 ethoxybenzamide, b_{13} 213° The products are of therapeutic value in the treatment of circulatory and respiratory organs — *Soc pour l'ind chim à Bâle* Ger Pat, 608,412, Jan 23, 1935 (Cl 12o 16) (S W G)

Antimony Compounds—Therapeutic, Bactericidal and Antiparasitic Organic Antimony oxyacids are dissolved in solutions of salts formed by interaction of cinchona bark alkaloids such as quinine with polyhydroxy monocarboxylic acids derived from aldoses such as the gluconic acid salts of quinine, etc., and the resulting clear solution is evaporated *in vacuo* to obtain the product such as $C_9H_{10}O_{20}N Sb_2$ — WALTER KUSSMAUL (to Chemische Fabrik vorm Sandoz) U S Pat 1,991,283, Feb 12, 1935 (S W G)

Dibroluur (Society for Chemical Industry, Katwijk, Netherlands) is bromdiethylacetylurea which appears on the market in 0.5 Gm tablets — *Pharm Weekblad*, 72 (1935), 371 (E H W)

Eumarcon (Riedel de Haen, Berlin) is the sodium salt of isopropyl- β bromallyl-*N* methyl malonylureum. It is found on the market in a 10% stabilized aqueous solution used as an intravenous injection for producing partial narcosis in small operations and narcosis in operations of short duration — *Pharm Weekblad*, 72 (1935), 277 (E H W)

Picochrome—New Urinary Antiseptic Picochrome is a new water soluble azo dye consisting of orthocresyl 5,5, azo 4,6 diamino 2 picoline hydrochloride containing twenty per cent tetrabromoorthocresol. The structural formula of picochrome is given as follows



Picochrome incorporating diamino picoline, a newly discovered radicle, is a highly effective urinary antiseptic which exhibits distinct advantages in its bactericidal and bacteriostatic action. The analgesic effect on the mucous membranes of the urinary tract is particularly beneficial. Owing to its potency in high dilutions copious fluid intake may be maintained. It acts equally well in acid and alkaline urines and against *Bacillus coli*, as well as against coccus infections of the urinary tract. The drug is well tolerated by mouth intravenously and locally, even over long periods. All types of urinary infections have been treated some resulting in excellent cures but the majority being influenced with varying degrees of benefit. Although picochrome cannot be classed as the ultimate urinary antiseptic, it presents enough advantages to warrant its inclusion in our favored armamentarium against urinary infection — A RAVICH *Med Record*, 141 (1935) 343 (W H H)

Prontosil (I G Bayer) is a preparation particularly useful against the principal causes of sepsis, streptococci, staphylococci, etc. It is the hydrochloric acid salt of 4 sulphonamide-2,4 diaminobenzol. Prontosil is a reddish crystalline powder having a melting point of 247–251°. It is rather indifferent pharmacologically, relatively large doses being secreted unaltered in the urine in test animals. Beginning doses are 3–6 tablets per day each tablet weighing 0.3 Gm. Ampuls also appear on the market containing 20 cc of a 0.25% solution for intravenous injection — *Pharm Weekblad* 72 (1935) 371 (E H W)

Tannin—Difficultly Soluble Preparation of About 153 parts tannin 33 parts aluminum hydroxide and 25 parts calcium oxide or aluminum or calcium salts equivalent to them are boiled together. An almost tasteless, greenish powder is obtained which is useful as an intestinal astringent — DARMOL *Gyogyszervegyeseti Ipari és Kereskedelmi R T* Hung Pat, 111 367 Jan 2 1935 (S W G)

SPECIALTIES

Adexoline (Glaxo Laboratories London) contains vitamins A and D in high concentration and in the proportion in which they occur in cod liver oil. The vitamin A is obtained from liver oils from the codfish and the halibut. The vitamin D is calciferol G L, the pure crystalline

Antiseptics for the eye can be applied in many forms. For instance, lotions, as follows: saline boric acid, sodium bicarbonate, flavine, mercury bismide, zinc sulphate, potassium permanganate, drops as (a) the silver group—silver nitrate, argyrol, protargol, neoprotosil, collosol argentinum, (b) zinc sulphate collosol zinc, (c) copper sulphate, (d) mercurochrome. Powders to be dusted inside the lids—in a very fine state of subdivision: calomel, iodoform, boric acid. Ointments such as yellow mercuric oxide, zinc oxide, staniform, neoprotosil, copper sulphate and trachomian ointment. The mydriatics such as atropine, homatropine, etc. act on the iris in such a way that the pupil tends to dilate. The myotics, eserine and pilocarpine contract the pupil and help to reduce intraocular tension.—D L CHARTERS *Pharm J*, 134 (1935) 213

(W B B)

Parathyroid Tetany—Treatment of While Collip's parathormone is active in raising the level of the serum calcium and relieving the symptoms of parathyroid tetany, it is not satisfactory unless injected in large and repeated doses. It is also expensive. In most cases therefore it is impracticable to employ it. The intravenous administration of 10 cc of a 10% solution of calcium chloride produces relief of symptoms in a few minutes lasting for about a day and a half. It is an excellent emergency measure. While injecting a solution of this strength care must be taken that none of it escapes into the subcutaneous tissue for necrosis of tissue and ulceration may result. A good method of treatment is to present continuously to the bowel a large amount of calcium in the form of calcium chloride (150 gr daily). In cases where this is not effective, 50 to 100 cc of N/3 hydrochloric acid should be given to increase the absorption of calcium. This acid is given in milk in the proportion of 1 to 20 of milk.—D CAMPBELL *Lancet* 228 (1935), 369

(W H H)

Quinidine Sulphate—Evaluation of Use of, in Persistent Auricular Fibrillation A study of 49 cases of auricular fibrillation in which 46 were classified as permanent and 3 as transient treated with quinidine sulphate showed that normal rhythm was restored in 35 or 71.4% of the cases. Of 33 cases with adequate follow-up notes, only 17 or 51% remained regular over 1 year. Two tenths gram of quinidine sulphate was given orally as a test dose the following day 0.3 Gm was administered 3 times and each day the dose was increased 0.1 Gm until the rhythm became regular when the patient was placed on a maintenance dose. Rheumatic valvular disease is most resistant; non valvular fibrillation responds more readily and in cases of hyperthyroidism without cardiovascular disease treated post operatively reversion to normal rhythm is practically invariable. Duration of fibrillation influences to some extent the likelihood of reversion cases with a short history reverting more readily. It is doubtful whether most cases are in better health with a regular rhythm than with auricular fibrillation when the ventricular rate can be kept slow. There is no method of predicting fatal results with quinidine therapy. The presence of fibrillation and increasing years are both separate factors favoring auricular mural thrombosis. The four indications for the use of quinidine sulphate seem to be: the presence of fibrillation in an otherwise normal heart, its persistence after operation for hyperthyroidism, when the irregularity is the cause of intractable palpitation and in certain hopeless cases where other forms of treatment have failed. Contraindications are an idiosyncrasy to quinine and a previous history of embolism, badly damaged hearts, marked cardiac hypertrophy and long standing fibrillation, etc.—C M KOHN and S A LEVINE *Ann Internal Med* 8 (1935), 923 through *Squibb Abstract Bull*, 8 (1935) A-447

Strophanthin—Value of, in Angina Pectoris E Edens (*Munch med Woch* (Sept 14 1934) 1424) believes that angina pectoris is most commonly due to anemia of the heart following increased irritability and spasm of the coronary blood vessels. He has given strophanthin—0.3 mg strophanthin is given daily (in severe cases twice daily) for three days with an interval of one day. The attacks became less frequent and less painful and stopped altogether in a short time. He also states that intravenous injection is better than intramuscular or oral administration.—*Brit Med J* 1 (1935) 138c

(W H H)

NEW REMEDIES

SYNTHETICS

Alkoxybenzamides—Substituted N N Dimethyl (or -diethyl) di (or tri) methoxy (or -ethoxy) benzamides are prepared by standard processes e g from the alkoxybenzoyl halides and dimethyl amine or diethyl amine. Examples are given of the preparation of veratric acid

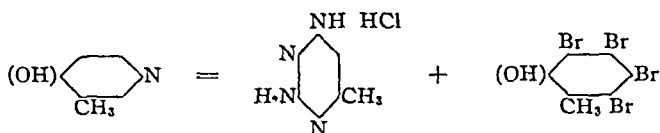
dimethylamide, b_1 203°, melts at 102–103°, and diethylamide, b_1 205°, *N,N* dimethyl 3,4,5 trimethoxybenzamide, b_{13} 218°, melts at 74°, *N,N* diethyl 3,4,5 trimethoxybenzamide, b_{13} 220–226° melts at 54°, *N,N* dimethyl 2,3 dimethoxybenzamide b_{12} 172°, *N,N* diethyl-3 methoxy 4,5 diethoxybenzamide, b_1 211–212°, *N,N* diethyl 3,5 dimethoxy-4 ethoxybenzamide, b_{13} 213° The products are of therapeutic value in the treatment of circulatory and respiratory organs — *Soc pour l'ind chim à Bâle* Ger Pat, 608,412, Jan 23, 1935 (Cl 12o 16) (S W G)

Antimony Compounds—Therapeutic, Bactericidal and Antiparasitic Organic Antimony oxyacids are dissolved in solutions of salts formed by interaction of cinchona bark alkaloids such as quinine with polyhydroxy monocarboxylic acids derived from aldoses such as the gluconic acid salts of quinine, etc., and the resulting clear solution is evaporated *in vacuo* to obtain the product such as $C_{12}H_{10}O_6N_2Sb$ —WALTER KUSSMAUL (to Chemische Fabrik vorm Sandoz) U S Pat 1,991,283, Feb 12, 1935 (S W G)

Dibroluur (Society for Chemical Industry, Katwijk, Netherlands) is bromdiethylacetyl urea, which appears on the market in 0.5 Gm tablets —*Pharm Weekblad* 72 (1935), 371 (E H W)

Eumarcon (Riedel de Haen, Berlin) is the sodium salt of isopropyl β bromallyl *N* methyl-malonyleureum. It is found on the market in a 10% stabilized aqueous solution used as an intravenous injection for producing partial narcosis in small operations and narcosis in operations of short duration —*Pharm Weekblad*, 72 (1935) 277 (E H W)

Picochrome—New Urinary Antiseptic Picochrome is a new water soluble azo dye consisting of orthocresyl 5,5, azo 4,6 diamino 2, picoline hydrochloride containing twenty per cent tetrabromooresol. The structural formula of picochrome is given as follows



Picochrome incorporating diamino picoline, a newly discovered radicle, is a highly effective urinary antiseptic which exhibits distinct advantages in its bactericidal and bacteristatic action. The analgesic effect on the mucous membranes of the urinary tract is particularly beneficial. Owing to its potency in high dilutions, copious fluid intake may be maintained. It acts equally well in acid and alkaline urines and against *Bacillus coli*, as well as against coccus infections of the urinary tract. The drug is well tolerated by mouth intravenously and locally even over long periods. All types of urinary infections have been treated, some resulting in excellent cures but the majority being influenced with varying degrees of benefit. Although picochrome cannot be classed as the ultimate urinary antiseptic, it presents enough advantages to warrant its inclusion in our favored armamentarium against urinary infection —A RAVICH *Med Record*, 141 (1935), 343 (W H H)

Prontosil (I G Bayer) is a preparation particularly useful against the principal causes of sepsis streptococci staphylococci, etc. It is the hydrochloric acid salt of 4-sulphonamide-2, 4-diaminobenzol. Prontosil is a reddish crystalline powder having a melting point of 247–251°. It is rather indifferent pharmacologically relatively large doses being secreted unaltered in the urine in test animals. Beginning doses are 3–6 tablets per day, each tablet weighing 0.3 Gm. Ampuls also appear on the market containing 20 cc of a 0.25% solution for intravenous injection —*Pharm Weekblad* 72 (1935) 371 (E H W)

Tannin—Difficultly Soluble Preparation of About 153 parts tannin, 33 parts aluminum hydroxide and 25 parts calcium oxide or aluminum or calcium salts equivalent to them are boiled together. An almost tasteless greenish powder is obtained which is useful as an intestinal astringent —DARMOL *Gyógyszervezetési Ipari és Kereskedelmi R T* Hung Pat, 111 367, Jan 2 1935 (S W G)

SPECIALTIES

Adexolone (Glaxo Laboratories, London) contains vitamins A and D in high concentration and in the proportion in which they occur in cod liver oil. The vitamin A is obtained from liver oils from the codfish and the halibut. The vitamin D is calciferol G L the pure crystalline

product Each cc contains 40,000 vitamin A units and 2000 vitamin D units, that is 20 times that of cod liver oil It is found on the market in vials of 8 Gm and in capsules—*Pharm Weekblad*, 72 (1935) 277 (E H W)

Aecuferrolstroop with Manganese (N V Kon Pharm Factories of Brocades & Stheeman and Pharmacia, Netherlands) contains 2 mg of manganese per tablespoon—*Pharm Weekblad*, 72 (1935) 370 (E H W)

Alleton (Riedel de Haen) is a preparation containing 12% garlic oil in chemical combination with dioxycholic acid which occurs on the market in pills Each pill contains the active ingredients of one gram of garlic The iodine and sulphur bearing oils of garlic have been recommended in intestinal derangements dyspepsia arteriosclerosis and hypertonicity The crystalized combination with dioxycholic acid has a less disagreeable odor and taste The dose is one tablet three times a day—*Pharm Weekblad*, 72 (1935), 277 (E H W)

Alloform (Curta & Co, Berlin) is an alum earth preparation used in preparing solution of aluminium acetate—*Pharm Weekblad*, 72 (1935), 277 (E H W)

Allyarsin is the alternative name for *Danarsin* which should not be confused with *Danamin* (see *J A Ph A*, Abstr Sec, 24 (1935) 40)—*Pharm Weekblad* 72 (1935), 277 (E H W)

Alpecine-Oil (Dr A Wolff Bielefeld) is a "hair-grower" made from olive oil with a lecithin emulsion This firm also manufactures Alpecine-Hairwater for washing hair—*Pharm Weekblad*, 72 (1935) 277 (E H W)

Brocanal (Curta & Co, Berlin) contains 0.025 Gm phenylethylbarbituric acid 0.4 Gm bromcalcium diethanolamine and 0.015 Gm caffeine It is used in epilepsy—*Pharm Weekblad* 72 (1935) 277 (E H W)

Cantan (Bayer Hoechst) is vitamin C Each tablet contains 0.025 Gm ascorbic acid—*Pharm Weekblad*, 72 (1935), 277 (E H W)

Coffex (Dr R & O Weil Frankfurt) is a new name for "Coffeo citrine" a mixture of acetyl salicylic acid and caffeine—*Pharm Weekblad*, 72 (1935) 277 (E H W)

Decholine (Chemical factory of Riedel-de Haen Berlin) is the legally protected name under which dehydrocholic acid in 0.25 Gm tablets and sodium dehydrocholate in 5% and 20% solution, in ampuls is found on the market It serves as a choleric and cholagogue in gall stones etc The solution is used intravenously 5-10 cc every two or three days, the tablets 1-2 tablets three times a day—*Pharm Weekblad* 72 (1935) 277 (E H W)

Diaturasa (Cera Laboratories Barcelona) is a remedy for rheumatism gout lumbago neuralgia, etc appearing on the market in four forms The liquid for injection contains according to the label, salicylic-benzo benzylic ethyl ester 40 mg benzyl morrhuate 100 mg, benzyl sulphide 10 mg camphor 10 mg, ether 50 mg, olive oil to make 1 cc The capsules contain salicylic benzo benzylic ethyl ester 100 mg benzyl morrhuate 95 mg, benzyl sulphide 5 mg, per capsule The granules contain lithium nucleotriphosphor 5 Gm methyl phenyl quinoline carbonic acid 6 Gm hexamethylenetetramine sulphosalicylic acid 6 Gm, sodium methylarsenate 25 mg tartaric acid 40 Gm, sodium bicarbonate 40 Gm, essence of peppermint essence of bananas, vanillin *q s* for 100 Gm of granules The ointment contains salicylic-benzo benzylic ethyl ester 25 Gm, terpineol 10 Gm camphor 5 Gm menthol 2 Gm, oil of juniper 1 Gm oil of sage 0.5 Gm, compound oil of hyoscyamus *q s* ad 100 Gm It is not clear just what salicylic-benzo benzylic ethyl ester and the other compounds really are—*Pharm Weekblad* 72 (1935), 370 (E H W)

Digalol (Riedel de Haen) is mentha dioxycholic acid, found on the market in 0.1 Gm tablets The adjunction "mentha" is not clear as to whether it is a menthol ester or a mixture Dioxycholic acid is used in most affections of the liver and gall bladder It is thus used in gall stones and as a laxative The dose is two tablets three times a day—*Pharm Weekblad*, 72 (1935), 277 (E H W)

Eusod (Fabrik Schering-Kahlbaum A-G Berlin) consists of synthetic aluminum sodium silicate and magnesium oxide It is recommended for heartburn It is distributed in packages of 6 and 12 tablets—*Pharm Ztg* 80 (1935) 150 (G E C)

Hydronal (I G Bayer) is aluminum hydroxide prepared by a special process whereby it is readily soluble in the acid juices of the stomach When hydronal comes in contact with the gastric juice it gelatinizes and absorbs the acid Hydronal for use as an antacid in stomach affections appears on the market in 0.5 Gm tablets—*Pharm Weekblad* 72 (1935) 371 (E H W)

Kataline (Society for Chemical Industry, Katwijk, Netherlands) is a mixture of phenacetin 0.1 Gm, dimethylamidopyrin 0.15 Gm, quinine sulphate 0.05 Gm and caffeine 0.05 Gm appearing on the market in tablet form — *Pharm Weekblad*, 72 (1935), 371 (E H W)

Lanogeen (Chemical and Pharmaceutical Factory of E. Scheurlich, Hirschberg) is an ointment base which, like lanolin, takes up a large quantity of water. It contains cholesterol esters — *Pharm Weekblad*, 72 (1935), 277 (E H W)

Larostidin (Hoffman-La Roche and Co. A-G, Berlin) is a 4% isotonic and sterile solution of L-histidine monohydrochloride. It is used in the treatment of peptic ulcers of the gastrointestinal canal. One intramuscular injection per day for three weeks brings about disappearance of pain. The preparation is marketed in packages of 6 and 25 ampuls — *Pharm Ztg*, 80 (1935) 174 (G E C)

Lutreen (I. G. Farben) is a biologically standardized extract prepared from corpus luteum, which is found on the market in ampuls containing two rabbit units per cc. It serves in gynecological hemorrhages and in the prevention of abortion — *Pharm Weekblad*, 72 (1935), 277 (E H W)

Pelose (Schering Kahlbaum) is a homogenous mud which absorbs considerable water and becomes very plastic. It is used as a cataplasm in rheumatic affections — *Pharm Weekblad*, 72 (1935), 277 (E H W)

Per-iodotheodural (Society for Chemical Industry, Katwijk, Netherlands) is a mixture of 30 mg of papaverine HCl and 417 mg of Calcium Salicylate with Theobromino Calcio, appearing on the market in tablet form — *Pharm Weekblad*, 72 (1935), 371 (E H W)

Proviron (Schering-Kahlbaum) is a standardized male sex hormone, of which the formula appears to be $C_{19}H_{20}O_2$. It is used as subcutaneous and intramuscular injection — *Pharm Weekblad*, 72 (1935), 277 (E H W)

Sulfigen (Anhaltisches Serum-Institut, Berlin) is a colloidal sulphur preparation with no protective colloids containing about 0.13% sulphur and 0.57% sulphur dioxide. In solution polythionic acids are formed which penetrate gelatin and tissue to a depth of 2 mm and which change into colloidal sulphur and sulphurous acid. It is used in the form of a wash for slowly granulating infected wounds, eczema, pruritis, ichthyosis and psoriasis. For use, the contents of a tube are dissolved in 0.5 liter of water, and as soon as the solution becomes cloudy and develops the characteristic odor of sulphurous acid it may be applied. It should be used at once as its activity begins to diminish within 30 minutes. It is marketed in cartons containing 5 tubes — *Pharm Ztg*, 80 (1935) 189 (G E C)

Tonicum Katwijk (Society for Chemical Industry, Katwijk, Netherlands) consists of liquid extract of kola 200, saccharum 200, aromatic spirit 90, glycerin 125, saccharas manganosus 2, tincture of nux vomica 10, sodium methylarsenate 1, sodium biphosphate 37, distilled water ad 1000. Use and dosage is left to the physician — *Pharm Weekblad*, 72 (1935) 371 (E H W)

Tonicum Noury (N. V. Nourypharma, Deventer, Netherlands) contains liquid extract of kola 20, glycerin 10, tincture nux vomica 1, sodium methylarsenate 0.1, saccharas manganosus 0.2, sodium biphosphate 3.7, corrigenda ad 100. It is directed to be used two to three times a day, one half hour before meals. 1-2 teaspoonfuls for adults and $\frac{1}{2}$ -1 teaspoonful for children — *Pharm Weekblad*, 72 (1935) 372 (E H W)

Tyronormon (Schilddrüsen Schutzzstoff) (Sächsisches Serumwerk, Dresden) is a standardized and biologically assayed antithyroidal (1 tablet = 10 AT). It is given in doses of two tablets three times a day and is used in Grave's disease and thyreotoxicosis. The diet is directed to contain no meat or fish but should contain 1-2 liters of milk — *Pharm Weekblad*, 72 (1935) 372 (E H W)

Vaccine Dr. Aman (Bayrol Chemische Fabrik, Munich). This preparation is used for the early diagnosis of cancer and malignant tumors and is prepared from staphylococci which are always present in tumors. It is supplied in ampuls containing 0.3 cc of which about 0.1 cc after previous shaking of the ampul is injected subcutaneously into the forearm. Irritation and rubbing at the point of injection is to be avoided. A malignant growth is present if after 24 hours a bright red coloration and infiltration may be seen at the point of injection — *Pharm Ztg*, 80 (1935) 212 (G E C)

BACTERIOLOGY

Antimeningococcus Serum—Notes on the Concentration and Purification of Purification of the globulin is best accomplished by fractional solution in dilute sodium chloride with from 66 to 88 per cent of the serum protein removed. Isoelectric fractionation eliminated 76 to 85 per cent zinc chloride 79 to 85 per cent, and dialysis and isoelectric fractionation 67 to 80 per cent of the serum protein. The sodium chloride method proved simplest, best for large quantities of serum and the product may be diluted without precipitation with sodium chloride solution—PHILIP MURDICK and SOPHIA M COHEN *J Immunol*, 28 (1935), 205 (A H B)

Antityphoid Serum—New. In experiments on mice, published in *Lancet* 227 (1934), 186, it was established that antityphoid sera containing O and Vi antibodies exert two separate and distinct effects, viz (a) The Vi antibody confers protection against infection with highly virulent strains of *B typhosus* by suppressing the multiplication of the organisms (b) The O antibody appears to be chiefly responsible for effecting the neutralization of the endotoxin of *B typhosus*. It was concluded that the efficacy of the therapeutic antityphoid serum would depend on the presence in it of both these antibodies. From the clinical trials it may be stated that some action on the toxic symptoms and on the fever was exercised by the antityphoid serum—A FELIX *Lancet* 228 (1935) 799 (W H H)

Bacillary Dysentery—Cause of, in Infants and Children. Chemical and bacteriological data indicated that the Flexner and Sonne strains of the *Eberthella paradysenteriae* were responsible for 74% of the infectious diarrheas of children and infants. The organisms gradually disappear after the fifth day. The etiological organisms were diagnosed by titer agglutinations—G A DENISON and G DEHOLL *J Infect Dis*, 56 (1935) 124 (A H B)

Chlorine—Bactericidal Action of. Because chlorine is one of the most widely used germicides in public health work an effort is made in this paper to determine the bacterial death rate caused by various concentrations of chlorine. There seems to be concentrations which first stimulate then inhibit, and finally in higher concentrations kill various pathogenic organisms. Exposed to 10-6 dilutions of chlorine one million bacteria were reduced 99 per cent. The results however indicate bacterial growth is just as great before as after the action of chlorine. Bacterial death, then is reversible to a certain extent and also there are zones of life dormancy after death. Many germicides cause dormancy and not death judging from the tabulations recorded in the paper—C S MUDGE and F R SMITH *Am J Pub Health* 25 (1935) 442 (A H B)

Diphtheria Toxoid—Value of Alum-Precipitated. A potent batch of alum precipitated toxoid was tested on five groups of children all of whom were Schick positive before inoculation. Each child received one dose (1 cc) of this material, and in 152 cases a final Schick test was performed one month after the injection. It has been shown that the figure 83.6 ± 2.0 represents the average percentage of children who became Schick negative within four weeks. The reactions were classified into three types—general local erythema and local induration. Generally these reactions were very mild but the occurrence of much more severe reactions in two cases shows that due care must be exercised in this work and emphasizes the necessity for a strict interpretation of the Moloney test—E A UNDERWOOD *Lancet* 228 (1935), 137 (W H H)

Diphtheria Toxoids—Comparison of Value of Merthiolate and Phenol as Preservatives for Diphtheria toxoid is best preserved by merthiolate 1:10,000 at icebox temperature. After two years it showed better antigenic value than similar toxoid when preserved with 0.5 per cent phenol—OLGA R POVITZKY and MINNIE EISNER *J Immunol*, 28 (1935) 209 (A H B)

Disinfectants—Advances in Testing of. The Food and Drug Administration method of testing antiseptics which was designed by Ruhle and Brewer has the advantage of saving time work and material, and of making possible uniform and comparable results in the hands of different workers. The culture medium is better suited for bacterial growth and the method is not limited to a single test organism as is the case with the Rideal Walker and the U S Hygienic Laboratory methods. A table comparing the results obtained with the three methods is given. The F D A process is particularly well adapted for testing coal tar antiseptics and iodine solutions of various kinds and concentrations—E MAIER *Pharm Ztg* 80 (1935) 228 (G E C)

Germicidal Substances—Comparison of the Resistance of Bacteria and Embryonic Tissue to II Metaphen. Phenol and metaphen inhibit tissue growth to the limits of dilution of 1:840 and 1:76,000. The inhibition of staphylococcus growth occurs with phenol at 1:65, metaphen

1 6000 This gives for both approximately the same toxicity index of 12.9 and 12.7—A. J. SALLE and A. S. LAZARUS *Proc Soc Exptl Biol Med*, 32 (1935), 937 (A. E. M.)

Herpes Virus—Attempts to Produce Immunity with Large Quantities of Killed Dead virus is not able to produce any immunity—EARL B. MCKINLEY and RANDALL L. THOMPSON *Proc Soc Exptl Biol Med*, 32 (1935) 915 (A. E. M.)

Meningococcus Antitoxin—Ferry's Meningococcus antitoxin prepared by using, as antigens, soluble toxins of Types I, II, III, IV meningococci, appears to be a potent therapeutic agent for Types I and III meningococcus meningitis, as shown in a recent small series in London. Its potency in Type II meningitis is much more doubtful. It is suggested that intensive dosage—viz, twice daily spinal injections in early acute stage, combined with one or more intravenous injections—is an important factor in the success of treatment—N. S. BANKS *Lancet*, 228 (1935), 856 (W. H. H.)

Placenta Serum—Preparation of Anti-Measles Y. A. Finkelstein, et al (*Sov Paediat*, 3 (1934), 34) describe a method of preparing anti measles serum from placenta of normal women. The main features of this technique are heating the serum with chloroform to a temperature of 60° C., and testing its sterility subsequently by animal and cultural inoculations. The sera derived from thirty to forty placentae are then mixed before they are ready for use. The proportion of anaphylactic and other complications remained relatively low at 0.3 to 0.4 per cent. No difference in effect could be detected between convalescent and placental serum—*Brit Med J*, 1 (1935), 56 (W. H. H.)

Pneumococci—Application of the Neufeld Reaction to the Identification of Types of The Neufeld reaction for identification of pneumonia types with the consequent swelling of the capsules which become more distinct and show a ground glass appearance is still the most rapid, as well as a very accurate method of identifying the 32 types of pneumococci. Types I to XXXII are specifically reacted upon by homologous rabbit antisera. Specific type sera can be produced in rabbits. Type III and type VIII may react to the same type antisera—GEORGIA M. COOPER and ANNABEL W. WALTER *Am J Pub Health*, 25 (1935) 469 (A. H. B.)

Pneumococcus—Antigenic Characteristics in Man of Certain Products of the The duration of the immunity following the use of vaccine or of fractions is variable in different individuals but may persist at least over a period of three months. The antigenic response to type I vaccine is largely homologous while in type II vaccine the various fractions, though in different degree show much greater heterologous response—LLOYD D. FELTON, W. D. SUTLIFF and B. F. STEELE *J Infect Dis* 56 (1935) 101 (A. H. B.)

Staphylococcus—Special Variety of, Concerned in Food Poisoning The power of staphylococci to be the etiological factor in food poisoning cannot be recognized by agglutination, hemolytic or chemical characteristics. The staphylococcal food poisoners are therefore still undifferentiated strains—JOSEPH STRIATAR and EDWIN O. JORDAN *J Inf Dis* 56 (1935) 1 (A. H. B.)

Sterilization in Pharmaceutical Practice The value of two new sterilizing agents, namely, 'Katadyn' and 'Zephrol' is reported. Sterilization is discussed in detail and the following substances are arranged according to their ability to check the growth of organisms and their bactericidal action. The number designates the reciprocal value of the smallest fraction which gives an active dilution.

Substance	Titer	
	Checks Growth	Kills in 48 Hrs
Nipagin sodium	450	
Vuzin	500	200
Nipasol sodium	500	
Nipagin	800	
Nipasol	800	
Benzoic acid	1000	200
Nipabenzyl sodium	1000	400
Chloramine	1500	1500
Hexylresorcinol	1500	500
Quinosol	2000	400
Rivanol	2500	1500

Trypaflavin	3000	1750
Malachite green	3000	2000
Methylene Blue	5000	2000
Methyl violet	5000	2500
Brilliant green	6000	3000

H ESCHENBRENNER *Pharm Monatsh*, 16 (1935), 26-29 (H M B)

Streptococci—Studies on the Respiratory Mechanism of One of the initial products of metabolism in all streptococci is H_2O . A thermostable peroxidase was found to be present which appears to be intimately related to the thermolabile dehydrase mechanism in the cell. The ability of streptococci to activate 101 chemicals was studied which demonstrated the dehydrogenation of many carbohydrates. The dehydrase-peroxidase system plays an important role in the respiration of the streptococci.—M FARRELL *J Bact*, 29 (1935), 411 (A H B)

Tetanus Toxin—Immunizing Activity of, in Lanolin Immunization of rabbits against tetanus was produced by the injection of a non-attenuated tetanus toxin in lanolin and olive oil. The rabbit was injected with 4 cc of a mixture of 2 cc of toxin, 3 cc lanolin and 6 cc olive oil (equivalent to 10 L D's for the rabbit or 20 000 L D's for the guinea pig). The injection material was slowly resorbed. There were no signs of tetanus. Twenty-two days later the serum of the rabbit contained $1/3-1/10$ antitoxic units/cc and 1 cc was capable of neutralizing 100 M L D for the guinea pig. A second injection increased the antitoxic titre to 2 units/cc in 11 days.—G RAMON and E LEMETAYER *Compt rend*, 200 (1935) 592, through *Squibb Abstract Bull* 8 (1935) A 453

Tetanus Toxin—Photodynamic Effect of Methylene Blue on Tetanus toxin can be inactivated by optimum concentrations of methylene blue in the presence of light. *In vivo*, however, methylene blue does not inhibit the effect of tetanus toxin.—KARL M LIPPERT *J Immunol* 28 (1935) 193 (A H B)

Tuberculous Antibodies—Latent Tuberculoprotein (TPT) is prepared by precipitation with trichloroacetic acid and is 1.6 times as strong as Kock's Old Tuberculin for cutaneous tests. Specific tuberculous antibodies appear to be exfoliated into the circulation of patients who at some previous time had had a tuberculous infection as indicated by the positive skin test. If antibodies indicate in any way, resistance against tuberculosis, the results would suggest a persistent protection against tuberculosis long after the original infection.—A B BAKER and M WETHERBY *J Infect Dis* 56 (1935) 165 (A H B)

Zephriol—Use of, in the Preparation of Sterile Solutions for Injection The article is a supplement to a topic published in *Pharm Acta Helv*, Nos 10 and 11 1934. This paper deals with a new disinfecting medium which has just come on the market under the name of 'Zephriol', a preparation of the I G Farbenindustrie, and which is labeled as a mixture of high molecular alkyl dimethylbenzyl ammonium chloride. The agent is an aqueous solution of 'Zephriol' which is clear yellowish white, foams strongly on shaking, exhibits a faint pleasant odor and reacts weakly alkaline to litmus. Its activity in various strengths toward certain organisms and also their spores is stated. Tests are given which indicate its practicability for sterilizing the hands and rubber goods. It is non-irritant to mucous membranes in 0.5 or 1 per cent solution and is now being used in gynecological practice. The preparation is relatively non-toxic by mouth. In connection with the use of E K filters, we believe to have found in 'Zephriol' a material suitable for the pre-sterilization of the apparatus. From the above properties, it appears that 'Zephriol' can be recommended for general use in the hospital as well as in the sterilization of filters. We have also developed an apparatus for more rapid filtering of media.—H ESCHENBRENNER *Pharm Acta Helv* 10 (1935) 72 (M F W D)

CHEMISTRY

GENERAL AND PHYSICAL

Fusion Curves of Binary Systems Bromural and Veronal with Salol and Phenacetin. Two component mixtures, as follows, were investigated: (I) bromural-salol, (II) bromural-phenacetin, (III) veronal-salol, (IV) veronal-phenacetin. The aforementioned systems all form eutectic mixtures and in the liquid state the components are miscible in all proportions. The weight per cent compositions for corresponding crystallization temperatures were as follows:

(I) 3.5 per cent bromural at 40.8°, (II) 53 per cent bromural at 109.0°, (III) 1.5 per cent veronal at 41.2°, (IV) 26.2 per cent veronal at 121.6°—K HRYNAKOWSKI and M SZMYTÓWNA *Arch Pharm*, 273 (1935), 163 (L L M)

ORGANIC

Alkaloids

Cinchona Alkaloids Ketone Formation with Sodium Amide The patent method of Chichibabin for preparing α aminopyridine from the action of sodium amide on pyridine was used in an attempt to prepare amino derivatives of hydroquinine, quinine and cinchonine. However the alkaloid was transformed into the corresponding ketone instead—ALICE G RENFREW and LEONARD H CRETCHER *J Am Chem Soc*, 57 (1935), 738 (E B S)

Ephedrine Alkaloid—Crystalline Forms of Report is made of an investigation undertaken to show that the hemi hydrate is the usual hydrate of ephedrine, to determine the melting point of anhydrous ephedrine and to ascertain the effects of different amounts of water on the melting point. The alkaloid was distilled at 25 mm, any water came over quickly, the receiver was changed and distillation continued. The anhydrous base boiled from 151–153°. The solidifying point was between 38.0° and 38.1°. To get a number of values, molten anhydrous alkaloid was put into a round bottom flask fitted with a stopper for an Anschütz thermometer and a stirring rod. Cooling to 30° and stirring brought it to constant value where it remained for some time. A known weight of water was added to the melted mass and the solidification temperature again determined. The addition of water lowered the melting point until with 1.5 per cent a eutectic mixture, ephedrine ephedrine hydrate melted at 32.1°. Further addition of water raises the melting point until with 5 per cent a maximum of 40° occurs. Boiling points were determined at various pressures. When crystallized from an anhydrous medium like ether, crystals obtained analyzed 100 per cent. Crystallized from water or dilute alcohol, they analyzed 95 per cent. Anhydrous crystals are very hygroscopic, while hydrated are stable. The anhydrous and hydrated bases differ also in crystalline form and in their solubility in oil—E E MOORE and D L TABERN *J Am Pharm Assoc*, 24 (1935) 211 (Z M C)

Ergometrine Newly Discovered Alkaloid in Ergot There appears in the *Brit Med J*, 1 (1935), 520, through *Pharm J*, 134 (1935), 321, a communication by Chassar Moir and H W Dudley relative to the constituent which according to their investigations is responsible for the clinical effect of ergot preparations. Particulars as to the separation of this constituent will be published later. This body, which has alkaloidal properties is soluble in alkalis and the commonly employed extractive solvents. The ergot investigated by the authors contained 0.1% alkaloids calculated as ergotoxine. The new alkaloid which has been named ergometrine comprises about $1/12$ of the total alkaloids. The effect of ergotoxine occurs much later than the effect of ergometrine. When 0.5–1 mg of the new alkaloid is taken *per os* uterus contractions occur in 6.5–8 minutes, while with 2–3 mg of ergotoxine the contractions first occur after 35 minutes. Intramuscular injection of 0.25 to 0.5 mg and intravenous injection of 0.05 to 0.1 mg give the same effect as the above dose, *per os*. The new alkaloid gives the same color reactions as the other alkaloids of ergot—*Pharm Weekblad*, 72 (1935) 345 (E H W)

Ergot—Active Constituents of Pharmacological and Chemical Study After obtaining the total alkaloids in as pure condition as possible those alkaloids having slow ergotoxine or ergotamine type of activity were separated from the promptly acting new alkaloidal principle or principles. Details of procedure are reported. The new substance has not been obtained in pure crystalline form so only approximate quantitative data are given. A tabulation of eight alkaloids with name of discoverer and date, supposed composition, oxytocic activity, color reaction, cockscomb and isolated rabbit uterine reaction is given. Properties of the new alkaloid and of the others are discussed. Pharmacological action of the new alkaloid was tested by several methods. Moir's clinical observation that there is an important difference between ergotoxine or ergotamine and crude aqueous or hydro alcoholic extracts of ergot is confirmed and also his conclusion that there is a highly important "unidentified" substance present but other of his apparent beliefs are disproved. The described procedure for chemical separation shows that all of the significant oxytocic property is in the "total alkaloidal fraction". A method is described for fractionating total alkaloids and also for purification of the new substance. The main difference in pharmacological action of the new alkaloid from formerly known ones is its prompt oxytocic action.

especially orally. It probably is more soluble and more rapidly absorbable. Differences are not so great when given intravenously or when compared on isolated smooth muscle. Total alkaloids are absorbed only after passing into intestine of the cat and this is probably true in humans. Aqueous or hydro alcoholic extracts injected intravenously or subcutaneously are intensely irritant due to the inert fraction. Hydro alcoholic liquid extracts contain all the total alkaloids and completely represent the drug in oxytocic activity but are suitable only for oral administration because of the presence of irritant inert constituents that are responsible for pain and abscesses when injected. Aqueous liquid extracts do not contain all of the total alkaloids but practically all of the promptly acting 'X alkaloid'. The latter is the more important but the slow acting alkaloids add to duration of effect. Solid or pillular extracts that are highly active can be prepared but most of those available have had alkaloidal activity destroyed by heat. They owe most of the activity they have to 'X alkaloid'. Method of assay should be chosen for reliability and precision and the author favors a modification of the Broom Clark Rabbit Uterus method though the colorimetric method offers possibilities. The various methods will be considered in a separate report. All the methods require a standard of comparison but this standard has failed. The author has recommended that ergotamine ethanesulphonate or ergotamine tartrate be made the bioassay standard. The following conclusions are made by the author: (1) The pregnant cat has been found to be a suitable test subject upon which to study comparatively the oxytocic activity of various types of preparations and constituents of ergot. (2) A procedure involving oral administration of the ergot preparations has been described and used extensively for the above purpose. Such a procedure can be successfully employed in investigating the chemical source of the significant oxytocic activity of ergot. (3) Carefully prepared hydro alcoholic extracts of ergot such as Fluidextract of Ergot, U S P (U S P X or Interim Revision), or Liquid Extract of Ergot 1932 B P contain all of the important active principles of the drug. Such preparations are rich in alkaloids and remarkably prompt and effective upon the uterus following oral administration. (4) Aqueous extracts of ergot do not contain all of the important active principles of the drug. They are deficient in ergot alkaloids but are never alkaloid free unless they are many years old or the alkaloids have been destroyed by excessive heat in their manufacture. When carefully prepared these extracts are remarkably prompt and effective upon the uterus following oral administration. This prompt and effective activity is entirely out of proportion to the ergotamine or ergotamine equivalents of such preparations. (5) Ergotamine and ergotamine are indistinguishable in producing a much delayed and erratic action following oral administration. The activity of these alkaloids is, therefore far from being completely representative of the drug itself or its crude extracts as formerly supposed. (6) A hitherto unknown highly important active principle exists in ergot. (7) Every trace of the significant oxytocic activity has been found to reside in the chemically purified total alkaloids of the drug even in the so called aqueous extracts as shown by the prompt activity obtained from the 'Total Alkaloidal Fraction' in contrast to the complete lack of significant activity in the 'Alkaloid Free Fraction'. (8) Ergotamine and ergotamine are not representative of the total alkaloidal activity. The new active principle appears, therefore, to be another member of the specific alkaloids of ergot since it followed the other alkaloids in the chemical procedure used in obtaining the Total Alkaloidal Fraction. (9) The activity of aqueous extracts observed by Moir must have been due contrary to his belief to 'residual alkaloid' consisting mainly of the new alkaloid described in this report. The alkaloidal deficiency of such extracts is due to the inefficiency of water in extracting the ergotamine or ergotamine. Most of the more stable new alkaloid is readily extracted by water and hence appears in fairly representative amounts in such extracts. (10) The new alkaloid has been isolated in a sufficiently pure amorphous condition to permit of certain pharmacological and chemical comparisons with the hitherto known alkaloids. (11) The new alkaloid is closely related to ergotamine and ergotamine as is shown by similar chemical behavior and also as is shown by its similar pharmacological action when tested upon the isolated guinea pig uterus, the isolated rabbit uterus, the cockscomb and the carotid blood pressure of cats or dogs. Its activity persists for hours as does that of ergotamine and ergotamine. (12) The new alkaloid differs from ergotamine and ergotamine mainly by its much more soluble nature and by its more prompt and powerful oxytocic action following oral administration. The greater solubility together with the probability that the new alkaloid has a smaller molecule compared with ergotamine or ergotamine undoubtedly accounts for the more prompt absorption and greater

effectiveness of the new alkaloid (13) All of the remarkable observations of Mour can be explained by the demonstration of the existence of the new alkaloid (14) None of the active oxytocic principles of ergot (the specific alkaloids) is absorbed to any significant extent from the stomach of the cat, following oral administration (15) All of the active oxytocic principles of ergot (the specific alkaloids) are absorbed with varying degrees of rapidity from the intestine of the cat following oral administration The new alkaloid is promptly absorbed while ergotamine and ergotamine are absorbed with great difficulty This difference in absorption rate also manifests itself following subcutaneous or intramuscular injection (16) Ordinary aqueous or hydro alcoholic extracts of ergot are intensely irritant to the tissues following subcutaneous or intramuscular administration Severe abscesses develop at the site of injection, especially following the larger doses (17) The irritant and abscess forming properties are not due to the important active principles (the specific alkaloids) of ergot They are due to the otherwise pharmacologically inert extractives appearing in the liquid extracts (18) The color of an ergot preparation is no indication of its value or activity The purified total active principles are colorless in solution (19) Either ergotamine ethanesulphonate or ergotamine tartrate constitutes the best available "standard" for comparison in the evaluation of ergot preparations by the currently accepted quantitative methods (20) The Isolated Guinea-Pig method, as usually applied (as in testing Liquor Pituitarii, U S P), is wholly unreliable as a means of insuring significant activity in ordinary aqueous or hydro alcoholic extracts It measures chiefly the worthless non specific amine activity of such extracts (21) Clinical activity in reasonably standardized amounts can be insured by requiring official liquid ergot extracts to contain a total specific alkaloidal activity, equivalent to approximately 0.05 per cent, in terms of either ergotamine ethanesulphonate or ergotamine tartrate, when tested by the Cockscomb method, the Epinephrine Inhibition Rabbit Uterus method or the Colorimetric method This will provide for the presence of essentially all of the more important new alkaloid present in the parent drug plus varying but larger proportions of the less important ergotamine or ergotamine None of these methods can serve to differentiate between the new alkaloid, ergotamine or ergotamine in crude extracts (22) Solid or pilular extracts can be made to contain a satisfactory amount of activity by extracting properly and avoiding the use of excessive heat and exposure to oxygen in the process of concentration (23) The non specific amino bases of ergot (histamine tyramine choline, etc.) contribute nothing of a desirable nature to the characteristic oxytocic activity of the drug—MARVIN R. THOMPSON *J Am Pharm Assoc*, 24 (1935), 185 (Z M C)

Ergotocin The authors found that the alkaloids ergotamine, ergotamine and sensibamine are uniformly ineffective when administered to human mothers in doses of 2 mg. They found, however, that some fluid extracts of ergot were effective in doses corresponding to 3-4 Gm. of ergot. After a year and a half the authors were finally able to isolate a principle which they have named ergotocin which is uniformly effective in human mothers when administered orally in doses of 0.3 mg. and intravenously in doses as low as 0.1 mg. Three-tenths mg. of ergotocin roughly corresponds to 3-4 Gm. of crude defatted ergot. Ergotocin salts as well as the free base are white crystalline substances. The base melts at 155°. The picrate which is red melts at 195-197°. It differs from the other ergot alkaloids (ergotamine, ergotamine and sensibamine) in that it is not precipitated by Mayer's reagent in dilutions greater than 1:7500, while the other alkaloids are precipitated in dilutions of 1:200,000 to 1:2,000,000. The chemistry of ergotocin will be reported later. Ergotocin is not present in all samples of ergot acceptable on the basis of the U S P assay and therefore the authors believe that the isolation of this principle will put ergot therapy on a rational basis. The principle has low toxicity and small dosage gives prompt action in uterine hemorrhage—M. S. KHARASCH and R. R. LEGAULT *Science*, 81 (1935), 388 (E H W)

Harmine and Harmaline II Nitro and Amino Derivatives of *O*-Alkyl Ethers of Harmol and Harmalol Harmine is demethylated readily by heating in an open vessel with concentrated sulphuric acid at 120°, with the formation of quantities of harmine sulphate. Sulphonation is avoided by the use of phosphoric acid (d. 1.7) at the same temperature thus affording harmol in a yield of about 78 per cent of the theoretical. Demethylation of harmaline with sulphuric acid produces a mixture of harmol and harmalol, but phosphoric acid at 150° gives harmalol in about 80 per cent yields. The phenol bases were alkylated by means of *p*-toluenesulphonic acid esters: the ethyl ether m.p. 199-200°, *n*-propyl ether, m.p. 203-204°, *n*-butyl ether m.p.

218–220°, and isoamyl ether, m p, 237–238° of harmol were thus prepared Nitro derivatives of harmine and harmaline, in 65 per cent yields, were obtained by a modified Fischer method (Ber, 45 (1912) 1930), using acetic acid as solvent Nitroharmaline is oxidized to nitroharmine by chromic acid more advantageously than by permanganate By methylation of nitroharmine and nitroharmaline with methyl iodide, a yellow crystalline substance is obtained which is decomposed by sodium or ammonium hydroxides into *N* methyl bases The two nitro derivatives are reduced readily to the corresponding amines by powdered iron and hydrochloric acid The hydrochlorides of both amines are crystalline, unstable solids —R KONOWALOWA N PROSKURNINA and A ORECHOFF *Arch Pharm*, 273 (1935), 156 (L L M)

Indole Series—Studies in Complete Synthesis of Physostigmine (Eserine) Preparation of *d l l 3* dimethyl 5 ethoxyindolylethyl methylamine from tryptophan is given This amine was successfully separated into its optical antipodes by means of *d* camphorsulphonic acid and *d* tartaric acid The *l* modification of this amine, when reduced with sodium and alcohol gave a product identical with natural *l*-eserethole This compound was heated to 70–77° with anhydrous aluminum chloride, resulting in the formation of *l* eseroline, which can be converted to eserine by the method of Polonovski and Nitzberg —PERCY L JULIAN and JOSEF PIKL *J Am Chem Soc*, 57 (1935), 755 (E B S)

Morphine—Solubility of, in Different Solvents The following solvents were chosen water at 20° solutions of definite hydrogen ion concentration, solutions buffered with phosphate, with borate and hydrochloric acid, with borate and sodium hydroxide, mixtures of water and ethyl or methyl alcohols, mixtures of chloroform with isopropyl or ethyl alcohols The mean solubility of water free base at 20° by 14–20 days' agitation was 0.149 Gm per 1000 Gm of water The base has its lowest solubility at a *pH* of 8.9 Composition solubility graphs are given for the two component solvents —H BAGGESGAARD RASMUSSEN and F REIMERS *Arch Pharm*, 273 (1935), 129 (L L M)

Nicotyrine—Presence of, in Tobacco On steam distillation of 500 Gm finely ground Brazil tobacco in 3 liters of water containing 500 Gm of potassium hydroxide, a distillate of a strong yellow color is first obtained This is made distinctly acid with hydrochloric acid and extracted with ether The extract is washed with water acidified with hydrochloric acid To the wash water, enough picric acid is added to form a crystalline precipitate melting at 164° after repeated recrystallization from boiling water A hydrochloric acid solution gives, on boiling with ferric chloride an orange red color, the crystals give a violet color with a solution of *p* dimethylamino benzaldehyde in phosphoric acid This indicates that it is nicotyrine It is not certain whether it preexists in the plant or is produced in the fermentation process If this is purely a fermentation product it is derived from nicotine because the Brazil tobacco is free from reducing substances —A WENUSCH *Biochem Z* 275 (1935) 361, through *Chem Abstracts*, 29 (1935), 2662

Quinine Tannate—Behavior of Various Acids toward Cinchona bark contains its alkaloids in the form of insoluble tannates The solubility of quinine tannate was studied in different acids at several concentrations Hydrochloric and nitric acids dissolve about 1 molecule of quinine per 2 molecules of acid The solvent power of sulphuric, acetic, oxalic and tannic acids is much lower, but this action does not seem to be in any way related to the *pH* These phenomena are explained by the formation of soluble complexes of quinine tannate with the acid the solubilities of the various complexes varying considerably The complexes can react in solution with suitable ions to give by double decomposition less soluble complexes, hence the solvent power of hydrochloric acid is lowered in presence of certain salts such as potassium sulphate The solubility of the tannate increases with the temperature —E Q ANSINGH *Aan P van der Waalen* (1934) 148–158, through *Chimie & Industrie*, 33 (1935) 678 (A P C)

Essential Oils and Related Products

Aromatics and Volatile Oils—Advances in the Field of, in 1933 Ketones A review with an extended bibliography —S SABETAY *Rieschstoff-Ind* 10 (1935), 34–36 (H M B)

Cymbopogon Flexuosus Stapf and Cymbopogon Martini Stapf, Var Motia, Oils *C flexuosus* grown at Palermo from seed obtained from India yielded in two cuttings (end of July and of Sept) 124 cwt of leaves and 89.5 Kg of oil per Ha The oil had the following analytical characteristics *d*₄ 0.8893 *α* (10-cm tube) –3.2° *n*_D 1.485, citral (by bisulphite) 80% citral (by sulphite) 74% soluble in 1 volume of 80% alcohol and in 2 volumes of 70% alcohol Leaves

stalks and inflorescences of *C. martin* var *motia* grown at Palermo from seed obtained from Bombay were distilled separately and gave the following yields of insoluble and of soluble oils, respectively leaves 0.04, 0.07%, stalks 0.0, 0.03%, blossoms 0.347, 0.128%. The insoluble leaf oil, soluble leaf oil and soluble stalk oil had the following analytical characteristics d_{15}^{20} 0.9201, 0.9134, 0.901, α_{D}^{20} 42°, 17.1°, 29°, n_D^{20} 1.4175, 1.3685, 1.3683, acid no 0.001, 0.009, 0.009, ester no 16.80, 7.47, 18.67, ester no after acetylation 119.17, 104.53, 179.20, total alcohols 36.55, 31.59, 57.67%, combined alcohols 4.68, 2.08, 5.20%, free alcohols (as geraniol) 31.87, 29.51, 52.09%, soluble in 11, 4, 10 volumes of 70% alcohol, and in 2, 2, 2 volumes of 80% alcohol—F BRUNO *Boll. stud. inform. R. Giardino Col. Palermo*, 23 (1934), through *Parfums de France*, 13 (1934), 33–42 (in French and English) (A P C)

Essential Oil Industry in Seychelles An account of the present position of the industry and the possibility of improvement—W H HAINES *Bull. Imp. Inst.*, 32 (1934), 545–559 (A P C)

Essential Oils—Exports of, from Sicily 1934 A table containing a list of exports of essential oils during 1934 from Sicily, per steamer and rail, in lbs Avoirdupois net is given. The table contains the chief importers of lemon, sweet orange, bitter orange, bergamot, mandarin and sundry oils. Compared with the figures for 1933, the exports last year declined by 12,000 lbs but they were over 400,000 lbs above the shipments in 1932. Great Britain occupies the first place among the importers of Sicilian essential oils. The United States is second—*Perf. and Ess. Oil Rec.*, 26 (1935), 75 (A C DeD)

Essential Oils from Seychelles Two specimens of oil of *Cymbopogon nardus* (L.) Rendle (citronella oil) had analytical characteristics similar to those of Ceylon oil of citronella. A sample of oil of *C. citratus* (DC.) Stapf (lemongrass oil) was similar to commercial Cochinchina lemongrass oil, but had a citral content (86.5% total aldehydes by volume, by the bisulphite method) above the average for the commercial Cochinchina oil. A sample of oil of *C. flexuosus* (Nees) W. Watson? (or possibly a hybrid between *C. flexuosus* and *C. nardus*) and a sample of oil of *C. confertiflorus* (Steud.) Stapf possessed the characteristics of low grade citronella oils, a sample of oil of *C. flexuosus* (Nees) W. Watson had the characters of a low grade lemongrass oil. Oil of palmarosa distilled experimentally in the Seychelles, had normal characteristics and was of good quality, the total alcohols and ester contents were slightly higher and the free alcohols lower than usual in the commercial Indian oil. Of two samples of gingergrass oil examined, one was of normal characteristics and the other had characteristics suggesting it had been derived from a mixture of gingergrass and of palmarosa grass. Samples of oil distilled from fresh leaves, from dried leaves, from hairy or pilose leaves, and from smooth or glabrous leaves of *Eucalyptus citriodora* had normal characteristics and contained high citronellal contents (78.7 to 82.6%). Oil distilled from the plant known locally as "Toc Maria" and identified as *Ocimum basilicum* Linn (?) had constants resembling those of commercial Réunion sweet basil oil rather than those of the French, German, Algerian and Spanish oils. Oil of *O. viride* Willd. had constants falling within the range of previously examined oils from the same source, and the phenols (48%) consisted almost entirely of thymol, the oil would therefore be suitable for the production of thymol. Oil of *O. americanum* Mill. (= *O. canum* Sims) had the following characteristics d_{15}^{20} 0.9181, α_D^{20} -3.63°, n_D^{20} 1.4878, acid value 12.4, aldehydes and/or ketones (via bisulphite) 71% by volume, aldehydes as citral (via hydroxylamine) 62.3% by weight, acids and phenols (by absorption with KOH) 8%, soluble with slight opalescence in 2.2 volumes of 70% alcohol at 15.5°. The aldehydes consist mostly of citral, suggesting the existence of a third botanical species of this plant (cf. Glichitch and Naves *Chimie & Industrie* Special No., 1029–1033 (June 1933)). Oil of *O. sanctum* Linn. had d_{15}^{20} 0.9840, α_D^{20} -29.37°, n_D^{20} 1.5210, phenols (by absorption) 33%. The phenols consisted almost entirely of eugenol, contrary to the oils examined by Brooks, in which estragol (methylchavicol) was the chief constituent. Oil obtained in 0.665% yield from an unidentified species of *Ocimum* had the following analytical characteristics d_{15}^{20} 0.9385, α_D^{20} -9.93°, n_D^{20} 1.4871, acid value 6.5, ester value 1.2, ester value after acetylation 175.7, equivalent to 'total acetylizable constituents' (as $C_{10}H_{18}O$) 55.6%, apparent cineole (via o-cresol) 17.7%, soluble in 1.8 volumes of 70% alcohol at 15.5°. The odor resembled that of spike lavender oil but the oil had a considerably higher alcohol content than that of spike lavender. A sample of cinnamon root bark oil obtained in 1% yield contained only 36% cinnamic aldehyde and was much below B.P. standard in all respects. A sample of patchouli oil, distilled from plants which had been introduced into

Seychelles from Ceylon as representing the typical Singapore variety, had characteristics differing considerably from those of Singapore patchouli oil (derived from *Pogostemon patchouli* Pallett) but generally similar to those of Java oil (said to be distilled from *P. heyneanus* Benth., a species indigenous to India)—*Bull. Imp. Inst.*, 32 (1934), 511-539 (A P C)

Essential Oils from Seychelles A Survey of the Industry and Suggested Improvements A short discussion of each of the following oils: citronella, lemongrass, palmarosa, *Eucalyptus citriodora*, ocimum, cinnamon root-bark, patchouli oils is given—*Perf. and Ess. Oil Rec.*, 26 (1935) 78 (A C DeD)

Geranium Oil—Characteristics of 1934 Algerian The limits of the analytical constants of 160 samples of the 1934 Algerian harvest of geranium oil were in substantial agreement with those reported for the 1932 and 1933 harvest—*B. ANGLA. Ann. Fals.*, 28 (1935), 97-99 (A P C)

Mushrooms—Essential Oil from Investigations were made with fungi collected in the virgin forests of Brazil. The chemical constitution of well developed individuals of the genera *Clitocybe*, *Cortinarius*, *Hydnum*, *Hygrophorus*, *Hypholoma*, *Lactarius*, *Pleurotus*, *Polyporus* and *Psalliota* is listed. Investigation has shown that the greater part of the essential oil in fungi exists in glucosidal combination in the stems and cap, while another portion, rather small in quantity, is combined in the wax-like cover of the outside surface of the cap. For small scale laboratory purposes the glucosides of the species of fungi referred to were obtained by careful evaporation of the aqueous extracts under reduced pressure, the process resulting in viscid residues in most cases of extremely bitter taste, and ready solubility in alcohol. Hydrolysis was attempted with emulsin, invertase and diastase but without any effect whatever. It became evident that only specific enzymes of the same type, if not the identical kind, were able to produce hydrolysis. The enzymatic ferments may be extracted from the fungi by means of glycerin and precipitated from this solution by benzene. Irrigation with water, extended over a period of some days, may conveniently precede the extraction with glycerin, although by this process a certain proportion of enzyme is lost, the resulting substance is apparently more active, whether it is of a greater purity cannot be established. Typical results obtained from the treatment of fungi such as have been mentioned are given in a table—*FRED W. FRIESE. Perf. and Ess. Oil Rec.*, 26 (1935), 91 (A C DeD)

Umbellulone—Some Pharmacological and Bactericidal Properties of Report is made of an investigation of the oil of the California laurel and its ketone. Preliminary investigation included a study of the effect of umbellulone on blood *in vitro* and *in vivo*, its effect upon the intact heart of the frog and upon the atropinized frog heart, effect of physostigmine on umbellulonized frog heart and its effect on unanesthetized animals. In testing the fungicidal action of the oil and the umbellulone the organisms used were *Monilia tropicalis* and *Trychophyton interdigitale*. For germicidal action the organisms used were *E. typhi* and *Staphylococcus albus* and the wet filter-paper method and the Agar Plate Method of the Food and Drug Administration were tried. Several experiments on segments of isolated intestine were carried out, using cats' and rabbits' intestines. Effect of the ketone on the respiration and blood pressure was tried on dogs. Summarizing results it was found that umbellulone in blood produced methemoglobin *in vitro* and *in vivo* and decided hemolysis of human, guinea pig and horse blood. Injected intraperitoneally into a guinea pig it caused asphyxiation and death. Inhalation by guinea pig, irritated mucous membrane of eyes and nose and caused irregular respiration but no failure. In dilutions of 1:50 it killed *Monilia tropicalis* and *Trychophyton interdigitale* in 1-, 30- and 60 minute contacts. In presence of blood, peptone and gelatin there was a slight loss in fungicidal power. It killed *E. typhi* and *Staph. albus* in dilutions up to 1:500 in 15 minutes' contact. Phenolic coefficient was estimated as 6.25. It decreased frequency of the frog heart, caused loss of tone, decreased ventricle contraction, stoppage in diastole. Injection of atropine, caffeine or adrenaline had no effect. It probably acts on same nerves and fibres as atropine. Intravenous injection caused lowering of blood pressure and failure of respiration in dogs. These results with post mortem examination indicate that umbellulone probably acts as a depressant, produces rapid methemoglobin, apparently blocks pulmonary circulation, causes vaso dilation of heart and large vessels. The minimal lethal dose in dogs is about 0.178 cc per Kg of body weight, death being due to failure of respiration and in a few minutes stoppage of the heart—*MILLS & DRAKE and ERNST T. STUHR. J. Am. Pharm. Assoc.* 24 (1934), 196 (Z M C)

PHARMACEUTICAL ABSTRACTS

EDITOR A G DuMEZ, 32 S Greene Street, Baltimore, Maryland

ABSTRACTORS

WILLIAM B BAKER
JOHN C BAUER
GERSTON BRUCH
ARTHUR H BRYAN
HENRY M BURLAGE
ALBERT H CLARK
ZADA M COOPER
GUSTAV E C WALINA
AMELIA DeDOMINICIS
MELVIN F W DUNKER
PERRY A FOOTE
RALPH R FORAN
SAMUEL W GOLDSTEIN
H B HAAG
WILLIAM H HUNT
CASIMER T ICHNIOWSKI

ROLAND E KREMERS
CLIFFORD S LEONARD
L LAVAN MANCHEY
ARTHUR E MEYER
A PAPINEAU COUTURE
HARRY ROSEN
A S SCHWARTZMAN
EMANUEL V SHULMAN
EDGAR B STARKEY
MARVIN R THOMPSON
E G VANDEN BOSCHE
GLENN S WEILAND
ANNA E WHITE
ELMER H WIRTH
THOMAS G WRIGHT
MAX M ZERVITZ

CONTENTS

Fixed Oils, Fats and Waxes	106
Glycosides, Ferments and Carbohydrates	107
Other Plant Principles	108
Unclassified	109
Biochemistry	112
Analytical	117
Toxicological Chemistry	131
Pharmacognosy	
Vegetable Drugs	132
Pharmacy	
Galenical	132
Pharmacopœias and Formularies	133
Non Official Formulæ	133
Pharmaceutical History	135
Pharmaceutical Education	135
Miscellaneous	136
Pharmacology, Toxicology and Therapeutics	
Pharmacology	136
Toxicology	140
Therapeutics	140

Fired Oils, Fats and Waxes

Dihydroxypropyl Esters of Fatty Acids—Preparation of, and Use in Emulsions and Ointments Containing Water The various modern offerings of emulsifying agents are considered, especially the group consisting of an ester of a polyvalent alcohol, either ethylene glycol or glycerol with various fatty acids. A trade preparation "Tegin" (Goldschmidt, Essen) is taken as a prototype. Analysis shows this to be 4.38% sodium stearate, 10.11% stearic acid, 76.45% stearic esters of glycerol and 9.06% water and free glycerol (by difference). The stearic esters are a mixture of about equal parts of mono and distearins. The content of sodium stearate determines that the emulsion will be of the type oil in-water. A series of such esters has been prepared in the Control Laboratory of the Danish Apothecaries Society. Thus, hydroxyethylstearate may be made either from ethylenechlorhydrin and potassium stearate or from ethylene glycol and stearic acid. Synthesis by the latter method is described in detail. In the same way an hydroxyethyl oleate can be made. The glycerol ester, *dihydroxypropyl stearate* or "monostearin" can be made in pure form by several methods described in the literature but for the purpose desired the inexpensive method of direct reaction of the alcohol and fatty acid gives a satisfactory mixture of mono, di and tri stearates, chiefly, however the monostearates under the conditions described. *Preparation*—500 Gm stearic acid and 400 Gm glycerol (both of high purity) were mixed in a large flask and gradually brought, with boiling off of the water content of the glycerol, to 250° and held there one half hour. The whole operation takes about 2 hours. After cooling to 100°, the mixture was poured into a dish, then cooled to a cake separated from excess glycerol, washed and dried. The melting point was the same as that of "Tegin," 57° C. It did not, however, contain the sodium stearate of the "Tegin" formula. If made from cheaper commercial stearins, the odor was unpleasant. The preparation was soluble, one part in less than 10 parts of chloroform, in 40-50 parts ether, in about 100 parts benzol, in about 1000 parts petrol ether and in over 1000 parts alcohol. It was practically insoluble in water. In the same way a mono olein preparation was made from pure oleic acid and a mono laurin from *Acidum Cocos*, Ph. Dan (the fatty acids of cocoanut oil). Preparations from fatty acids of castor oil or of linseed oil are also suggested. An example of the use of the monostearin in a cosmetic ointment is cited. To form some sodium stearate to each 100 Gm of the melted monostearin, 15 cc of N/1 sodium hydroxide are added before the remainder of the cosmetic formula is mixed in. The colloid chemical theory of the influence of the emulsifying agent on the charge of oil droplets is discussed. The monostearin is not useful if acids or heavy metal salts are to be added to the ointment. In these cases amine salts of fatty acids are better emulsifying agents, for example, the diethylethylenediamine salt of oleic acid $C_{18}H_{33}CONHCH_2CH_2N(C_2H_5)_2$ ("Sapamine," Ciba). The phosphate, lactate or acetate of this amine is sometimes used as an emulsifying agent. The water-in oil creams, such as lanolin cetyl alcohol-vaseline ointments, etc. are also discussed. Here cholesterol or cetyl alcohol usually serves as the emulsifying agent. Mono olein or monolaurin can be used for this type of preparation. The use of mono glycerides in other types of emulsion preparations, such as liniments, is also discussed.—E. V. CHRISTENSEN *Arch. Pharm. og Chem.*, 42 (1935), 172, 197. (C. S. L.)

Hawthorn Fruit—Oil of No chemical studies of the fruit of the hawthorn have been reported in the literature. The characteristics of the fruit according to Grafe are given. The fruits were reduced to a coarse powder in a ball mill after drying as completely as possible at 98° in a drying chamber. Table I gives the results of an investigation of the kernels in terms of both the original and the dried fruits. The presence of about 48% crude fibre accounts for the difficulty experienced in powdering the material. The fruits are used chiefly (in Switzerland) in the preparation of hawthorn tea, while in other places they are used as a substitute for coffee. The tea made from the kernels is recommended for almost all possible sicknesses. A tea was prepared in the proportion of 60 Gm to 1 L. water filtered, studied and the results tabulated. Lastly, the oil extracted from the dried and powdered fruits with ether was completely investigated as to physical constants and some qualitative tests for the presence of various constituents such as phytosterol, etc. The oil was of an orange brown color, most of the color being due to unsaponifiable material.—J. PRITZGER and R. JUNGKUNZ *Pharm. Acta Helv.* 10 (1935), 75.

(M. F. W. D.)

Palm Oils—Composition of Commercial IV. Progressive Hydrogenation as an Aid in the Study of Glycride Structure. During hydrogenation the mixed palmito C_{18} glycerides frequently become completely hydrogenated in preference to the tri C_{18} -glycerides and to a less

marked extent, dipalmito oleins are often hydrogenated preferentially to monopalmito dioleins. By comparing the fatty acid components of the fully saturated and mixed saturated-unsaturated glycerides in a series of fats obtained by hydrogenation of a natural fat to various stages, it is possible to ascertain which of the classes of glycerides have passed into the completely hydrogenated state at different stages of hydrogenation and to select stages at which all dipalmito and some monopalmito glycerides (but no tri- C_{18} glycerides) have become fully hydrogenated. At these points the remaining mixed saturated unsaturated glycerides then include only monopalmito di- C_{18} - and tri- C_{18} glycerides, and a further estimation of the tri- C_{18} glyceride content of the original fat becomes possible. The respective percentage compositions of a Cape Palmas oil and a Belgian Congo oil follow: myristic acid 1.6, 1.3, palmitic acid 32.3, 41.4, stearic acid 5.5, 4.7, oleic acid 52.4, 42.9, linoleic 8.2, 9.7.—A. BANKS, H. K. DEAN and T. P. HILDITCH. *J. Soc. Chem. Ind.* 54 (1935), 77T. (E. G. V.)

Rose Mallow Seed—Oil of Analysis of Rose Mallow seed gave 20.23% of an ether-soluble oil resembling cotton and okra seed oils and consisting of glycerides of oleic acid (33.12%), linoleic acid (45.53%), palmitic, stearic and arachidic acids (15.60%) and unsaponifiable material (1.34%).—CHARLES BARKENBUS and SARAH T. THORN. *J. Am. Chem. Soc.*, 57 (1935), 728. (E. B. S.)

Shark Liver Oil Liver oils from five species of shark have been examined. Estimation of vitamin A was made colorimetrically by the antimony trichloride method using a biologically assayed cod liver oil for comparison. Free fatty oil and unsaponifiable matter were determined. Commercial samples were very poor in taste and color and with one exception inferior to cod liver oil in vitamin A. Since unsatisfactory conditions might be due to rendering methods, fresh livers were carefully rendered and tested. Two were considerably more potent in vitamin A, they were only one-tenth as strong in vitamin D. They were all free from bad odor and taste. All deposited stearine at room temperature.—W. S. JONES and W. G. CHRISTIANSEN. *J. Am. Pharm. Assoc.*, 24 (1935), 295. (Z. M. C.)

Glycosides, Ferments and Carbohydrates

Proteolytic Enzyme—Content of, in Latex from the Fig Tree (*Ficus Carica* L.) There is a marked seasonal variation in the amount of enzyme present per unit volume of sap and the concentration is lowest in early summer.—BENJAMIN H. ROBBINS. *Proc. Soc. Exptl. Biol. Med.* 32 (1935), 892. (A. E. M.)

Proteolytic Enzyme in the Latex from the Fig Tree (*Ficus Glabrata*) p_H of Optimal Activity The optimum hydrogen ion concentration for the ficin gelatin proteolysis is p_H 5.—BENJAMIN H. ROBBINS. *Proc. Soc. Exptl. Biol. Med.*, 32 (1935), 894. (A. E. M.)

Strophanthus Hispidus—Constituents of The author states that the family Apocynaceae is especially rich in plants containing as their active constituent glucosides having the therapeutic properties of heart tonics. To this family belong the many varieties of strophanthus which contain a heart-stimulant glucoside located in the seeds as well as in the bark of the plant. Fraser, Feist, Heffter, Sachs and especially Jacobs and co-workers undertook many investigations on strophanthus seed. *Strophanthus kombe hispidus* and *s. emini* all contain the constituent strophanthidin $C_{23}H_{32}O_6$. Besides strophanthidin it contains another glucoside periplogenin having the formula $C_{23}H_{34}O_6$. Arnould isolated ouabain $C_{29}H_{44}O_{12}$ from *Strophanthus gratus*. One of the products of the hydrolysis of ouabain, that is ouabagenin $C_{23}H_{34}O_8$, he was unable to isolate. The reason for this is that ouabain does not hydrolyze in acid solution like strophanthidin, but the "genin" is rather destroyed by hydrolysis. Jacobs and Bigelow isolated from ouabain with the use of a special method, a crystalline "genin," which contained one carbon atom less (C_{22}) than the original ouabagenin (C_{23}). This carbon atom separated out during the splitting up of the compound. In *Strophanthus sarmentosus*, Jacobs and Heidelberger have isolated sarmentocymarin, $C_{33}H_{46}O_6$, and then through hydrolysis they obtained sarmentogenin $C_{23}H_{34}O_8$. Because of close resemblance of all strophanthus seed, positive identification of their constituents is very difficult. A sample labeled *Strophanthus hispidus* was examined and through hydrolysis other "genins" were obtained in place of strophanthidin. The reason for this is not known. It was not possible to crystallize out the glucoside at first so that an acid was added to the crude mixture. Two "genins" were thus isolated, A $C_{23}H_{32}O_6$ and B $C_{23}H_{30}O_8$ which belonged to the same group of plant genins as strophanthidin, periplogenins, etc. Likewise they contained 23 carbon atoms

and gave a positive test with sodium nitroprussate and alkalis. The "genin" A, ($C_{21}H_{32}O_4$) has two hydroxyl groups which can be easily acetylated. In the molecule there is a double bond which can be hydrated by the removal of an (OH) group. The original "genin" would have had the formula $C_{23}H_{34}O_4$ which is an isomer if not identical with sarmentogenin which also has two hydroxyl groups. The "genin" B has the formula $C_{23}H_{36}O_4$ and is also unsaturated, three molecules of water were taken up during hydration. The original "genin" has the formula $C_{21}H_{32}O_4$ which is isomeric with ouabagenin. The relation to sarmentogenin and ouabagenin is not well established but can be indicated as monoanhydro hispidogenin A, and dianhydrohispidogenin B—R TSCHESCHE *Ber*, 68 (1935), 423 (G B)

Tea—Classification of Leaves and Stems of The tea found on the market is composed of buds, leaves, stems and young branches (twigs) of the tea shrub, *Thea chinensis*. On analysis all these constituents have the same composition, outside of the stems and young branches (twigs) which contain from 1.8–2.6% less "them" and produces a tea infusion of lesser aromatic flavor—I CUCULESCU *Bul Fac Stiinte Cernauti*, 7, 28–30 *Cernauti Instt der nuw*, through *Chem Zentr*, 106 (1935), 973 (G B)

Thevetin Cardiac Glucoside of Be-Still Nut The article consists of a description of the cardiac glucoside recently discovered by K. K. Chen. The substance was obtained from the Be still nut or *Thevetia nerifolia*, indigenous to South America but now cultivated in the East Indies, India, the Hawaiian Islands and Western Africa—*Chem and Drug*, 122 (1935), 456 (T G W)

Other Plant Principles

Drosera Rotundifolia—Constituents of A hydroxymethylnaphthaquinone, ($C_{17}H_{12}O_2$) m p 69–70°, and a second substance, m p 225°, were isolated from a steam distillate of the drug. From an ether extract of the dried residue remaining after steam distillation, there was obtained a brown crystalline quinone like substance in a yield of 0.001%. The compound $C_{17}H_{12}O_2$ was shown to be present also in *Drosera binata*—H DIETERLE *Arch Pharm*, 273 (1935), 235 (L L M)

Lupulin—Value of Fresh The active constituents of lupulin, which consist of an ethereal oil extract, were examined using the barium-method of Fromme. These constituents were acid in nature. This examination proved further, that the highest percentages of ethereal soluble extract were obtained from the fresh drug, these constituents were named "crude lupulin". These constituents of ethereal oil are little prone to decomposition when obtained from fresh drug. The determination of the ether-insoluble extract, gives no clue as to the freshness of the drug. In contrast to this a high content of "crude lupulin" indicates that the drug is fresh. Should this (content) be of a soft consistency this would indicate presence of resins and oleoresin—A TOMINGAS *Pharmacia* 14 (1934) 223–237, Tartu Univ, through *Chem Zentr*, 106 (1935), 930 (G B)

Marshmallow Root—Acidity of, and Presence of Calcium Soluble in Acetic Acid Samples of freshly collected root and extracts prepared before and after drying at 100° were acid to litmus paper. Commercial samples also gave acid reactions with litmus paper. The fresh root was washed, peeled and decorticated. A mucilage was prepared in the cold using water acidified with acetic acid. The mucilage was filtered, the filtrate treated with ammonium oxalate, the precipitate was filtered, washed and calcined. The residue was taken up in diluted hydrochloric acid, the solution neutralized with ammonium hydroxide and treated with ammonium oxalate in acetic acid medium. Calcium oxalate crystals formed. Samples of decorticated root yielded the following ashes: 3.95, 4.35, 4.05, 3.9 and 3.95%—P DUMONT and A DE CLERCK *J pharm Belg* 17 (1935), 305–307 (S W G)

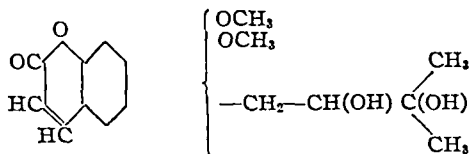
Monarda Fistulosa—Sterols from Phytochemical Notes No 111 Unsaponifiable material from the saponified fatty oil from the leaves of wild bergamot was imperfectly crystalline. Upon purification and recrystallization good crystals were obtained. The sterol was acetylated and crystallized and the absence of stigmasterol was indicated. Testing of larger amounts may show presence of stigmasterol with a sitosterol—OLE GISVOLD *J Am Pharm Assoc* 24 (1935) 214 (Z M C)

Nânâcatl Delirium Fungus (Amanita Mexicana) The active constituents of the fungus occur chiefly in the skin of the cap and are separated or the poisonous principles are destroyed by scalding with hot water in order that all of the properties are not completely lost and also made

unobjectionable to enjoy as a food Experiments show that the fungus contains at least 4 toxic principles and corresponding to these arise poisoning or intoxication cases with wholly different pathological pictures (1) the atropine like alkaloids affect the psychic exaltation with the feeling of pretended strength and a desire to show this property All secretions are strongly increased, pulse weak and easily repressed, (2) symptoms due to muscarine, and (3) the substances causing the real intoxication with its characteristic hypersensibility, with delirium of hours duration and finally stupor is unknown in our pharmacology as another of the fly-killing fungi An historical account, the toxicology and the nature of the intoxication are discussed fully —V A REKO *Pharm Monatsh*, 16 (1934), 29-31 (H M B)

Pinus Sabiniana—Sterol from *Phytochemical Notes* No 113 After saponification of the fatty oil from the seed of the Digger's pine, the nonsaponifiable material yielded a sterol After purification the sterol crystals melted at 137.5° and the acetate at 127.5° The digitonide obtained from the mother liquid was decomposed with boiling xylene the resulting sterol and its acetate having the melting points stated above This sterol therefore appears to be a sitosterol —OLE GISVOLD *J Am Pharm Assoc*, 24 (1935), 290 (Z M C)

Toddalolactone *Chemical Investigation of Toddalia Aculeata* (Pers) Part 2 A Zeisel determination indicated two methoxyl groups in the molecule of toddalolactone ($C_{16}H_{20}O_6$) Carboxyl and phenolic groups are absent Two hydroxyl groups are present, one secondary, the other tertiary in character With phthalic anhydride, the lactone gave a crystalline monophthalate (m p, 180-181°) The hydroxyl groups occur on adjacent carbon atoms since the lactone, by loss of a molecule of water, gave a crystalline ketone, $C_{16}H_{18}O_5$, which was characterized by its phenylhydrazone and semicarbazone The presence of a lactone ring is shown by the fact that treatment with diluted sodium hydroxide in the hot afforded an acid $C_{16}H_{17}O_7$, melting at 178-179° $[\alpha]_D^{30}$ in methanol = +36.1° The structural features of toddalolactone are depicted as here shown

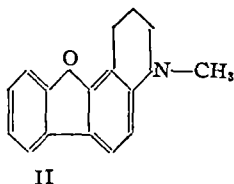
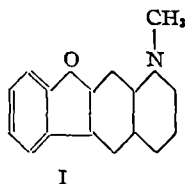


The positions occupied by the groups in the benzene ring are still undetermined —B B DEV and P P PILLAY *Arch Pharm*, 273 (1935), 223 (L L M)

Unclassified

Anesthetics—Some Colored Local Ten colored compounds were made by diazotizing procaine and coupling with various dye intermediates Those in which the diazotized procaine was coupled with methyl anthranilate *p* bromoaniline α naphthylamine, α -naphthylamine + α -naphthylamine methyl anthranilate + α naphthylamine and diazotized *p* nitroaniline + procaine showed anesthetic properties The compounds formed by coupling with hydrochloric acid salicylic acid resorcinol and methyl salicylate did not show anesthetic properties —J H GARDNER and L JOSEPH *J Am Chem Soc*, 57 (1935), 901 (E B S)

Benzofuroquinolines This article describes the preparation of certain derivatives of dibenzofuran with the hope of obtaining compounds which will exert in some degree morphine-like effects By application of Skraup's method to 3 aminodibenzofuran two isomeric "quinolines" were obtained These were hydrogenated to the py-tetrahydro derivatives and the secondary



bases thus obtained were converted into the *N*-methyl derivatives I and II. Physiological activity increased from the quinolines through the tetrahydro compounds reaching a maximum for the methyl derivatives. II was slightly more active than I—E. MOSETTIG and R. A. ROBINSON *J Am Chem Soc*, 57 (1935), 902 (E. B. S.)

Charcoal—Adsorption, Prepared from Crude Cellulose. The majority of commercial charcoal showed from 2–93 times less adsorption activity than *Carbo Medicinalis* or *Carbo Adsorbens* from the modern pharmacopœias. Through simple carbonization of cotton (raw absorbent cotton), peat moss and other similar products, are often obtained more active products than the commercial charcoals. Factors to be taken into consideration in the power of adsorption of charcoals are: rapid carbonization of the loose structure (material), raw material gives better results than a slow charring of a compact, solid structure which permits little air to go through. The best charcoal was obtained through simple ignition of cotton in a crucible, its adsorption power for methylene blue was only 7 times less than *Carbo Medicinalis*. Renewed ignition in smaller crucibles increased from 2–12 times its former activity—ST. BADZYNOKI *Wiadomosci farmac*, 61 (1934), 385–388, through *Chem Zentr* 106 (1935), 927 (G. B.)

Citric Acid. The manufacture of citric acid is carried on in two steps, namely, the production of calcium nitrate and the conversion of the calcium citrate into citric acid. The calcium citrate is either prepared from lemons or by the fermentation of sugar. Each case involves the oxidation of sugars to citric acid. By the use of the fermentation method, pure cane sugar is used. It is minutely regulated as to its precise nutritive value and oxidized by a pure strain of a cultivated mold—*Chem and Drug*, 122 (1935) 435 (T. G. W.)

β -Cyclopentyl and β -Cyclohexyl Glucosides—Biochemical Synthesis of. The synthesis of β cyclopentyl glucoside in cyclopentanone is formed from adipic acid, and the product is reduced to cyclopentanol. The cyclopentanol is dissolved in alcohol and water, and then saturated with glucose. After standing for 12 hours, 1.5 Gm. of emulsin (prepared by precipitating casein with acetic acid, adding $\frac{1}{4}$ of its volume of 95% alcohol clarifying with kieselguhr, and reprecipitating the emulsin with four times its volume of 95% alcohol) is added and the mixture is stirred continually, at room temperature. At the end of two days, polarimetric observations are made until the rotation does not change. One gram of emulsin is then added to insure complete reaction and the mixture is then permitted to stand again until the rotation is constant. The solution is filtered, and then distilled completely in a vacuum. The residue is dissolved in boiling ethyl acetate and the rotation is levorotatory. To further purify, the solution is evaporated to dryness and the residue is dissolved in water. The aqueous solution is exhausted with ether, and the last traces of glucose are destroyed by yeast. The solution is distilled in a vacuum, and the residue dissolved in ethyl acetate. The resulting solution of β cyclopentyl glucoside does not reduce Fehling's solution. A description of the physical and chemical properties of this compound is included. **Synthesis of β Cyclohexyl Glucoside.**—This synthesis is effected by saponification of the tetraacetyl derivative of β acetobromoglucose. The cyclohexanol is mixed with water and acetone. Glucose is added and the mixture agitated during 12 hours. The mixture is then filtered and 1 Gm. of emulsin is added. The angle of rotation is observed as before, and a modified extraction of the above compound is given, as well as the physical constants—J. VINTILESCO and C. N. IONESCO *J pharm chem*, 21 (1935), 241 (M. M. Z.)

Dyes—Medicinal. An address before the New York Branch of AMERICAN PHARMACEUTICAL ASSOCIATION was restricted to six dyes. The speaker's introductory remarks dealt with the antagonism shown by certain physicians to retail pharmacists. The apparent explanation was a feeling that the pharmacist was "allowing his interests to become so diversified in the field of commercial retailing" that he did not act for the best interest of his physician clients and they felt his information on technical subjects was getting exceedingly thin. The speaker discussed the question of defining dyes, it being nearly impossible to find a definition that is universally applicable. A medicinal dye is one that has been found by practical experience to be of use in the treatment of disease—they are not found by theorizing. One of the first artificial dyes was triphenol prepared in 1771. Commercial development was very rapid between 1890 and 1911. By 1914 Germany was far to the front but since the war, dye manufactures in other countries have excelled. The war brought on great interest in medicinal dyes and antiseptics. In the world dye situation at present there are four important competing groups: Methylene Blue, one of the oldest and most interesting dyes, has had much publicity over its use as an antidote for poisoning.

by cyanide, illuminating gas, carbon monoxide. There are better antidotes for cyanide, nitrites and sodium thiosulphate as well as sodium tetrathionate apparently are better. It is not likely to be useful in carbon monoxide poisoning because it apparently forms methemoglobin. Its surgical uses are in wounds, injuries or diseases of sinuses, mouth, pharynx, gums. Other uses are less well developed. Crystal Violet, hydrochloride of hexamethyl pararosaniline, appears to be especially effective against gram positive bacteria: staphylococci, the diphtheria bacillus. Neutral Acriflavine is the most toxic of the dyes in common use. Its widest use is for acute, subacute and chronic urethral gonorrhea. Scarlet Red Sulphonate is a complex sodium salt related to betanaphthol. Like Scarlet Red Medicinal Biebrich it stimulates growth of epithelial tissues. Brilliant Green has much the same indications as Crystal Violet but is a less efficient bacteriostat and more stimulating to wounds. A rather new use for it is in so called "barber's itch." Medicinal Fuchsin is said to be a mixture of rosaniline and pararosaniline hydrochlorides. The medicinal dye is not that used for staining. Athlete's foot, trichophytosis and similar infections are treated with a preparation containing medicinal Fuchsin. A new use of Fuchsin is for burns. Once Carron Oil was largely used, more recently the tannic acid treatment has had considerable use because of the theory that a burn protein produces the toxicity. This theory may not be completely tenable. Some investigators felt that the abstraction of tissue fluid was the principal underlying cause of the serious effects. Logical outgrowth of this theory was the introduction of large amounts of fluid and this treatment is routine in good hospitals, but this theory is probably not based upon the principal factor. A third theory recently proposed is that intoxication following severe burns is the direct result of infection. Treatment has been designed to eliminate infection. Originally a vaporizing spray of 1 per cent solution of Gentian Violet was used, later Crystal Violet was used, now it is thought a mixture of Crystal Violet, Acriflavine and Brilliant Green or Fuchsin may be best. Dyes are contraindicated about the eye. Dyes in excess of 0.5 Gm. should not be injected in solutions into closed cavities. They should not be used in dirty, crushed wounds until the wounds have been surgically cleaned up. Patients who have been taking large amounts of dyes internally should not be subjected to direct sunlight where it is intense.—DAVID A. BRACE *J. Am. Pharm. Assoc.*, 24 (1935), 241 (Z. M. C.)

Ethyl Ether, U. S. P.—Stability of. It was found that U. S. P. ether, as supplied at the present time in large metal containers in this country, does not deteriorate rapidly when the container is opened. Using the Nessler reagent for aldehyde determination and potassium iodide for peroxides, results indicated no deterioration products as long as 68 days after the first opening of the large drums of U. S. P. ether. In clinical investigation, the anesthetist was found unable to distinguish the effects of drum ether in small cans labeled "for anesthesia" by the reaction of surgical patients (702), when ignorant of the source of the ether used. The authors conclude that there is no difference between the anesthetic effects of drum or anesthetic ether.—H. GOLD and D. GOLD *Anesthesia and Analgesia*, 14 (1935), 92, through *Squibb Abstract Bull.*, 8 (1935), A-505.

Gelatin—Use of, in Medicine. Gelatin possesses properties which are more adapt to intravenous usage than is acacia. Acacia appears to have a viscosity equal to that of the blood and an osmotic pressure equal to that of the colloids in the blood under normal conditions. However, it is simply a mechanical agent rather than one activating body tissues. Gelatin not only possesses the properties of a gum, but also those of a nutrient, hemostatic and stimulant to antibody formation. It is also an animal tissue, with elements of an incomplete protein. The fear that sterilization of gelatin (140° C.) produces an ineffective preparation has been shown to be partially in error, because even though the product is less effective than the unsterilized preparation (possessing a possibility of tetanus spores) an increase in dosage is all that is necessary to obtain the desired results. Gelatin is a valuable adjunct to infant feeding and in adult dietaries. It is of particular importance in preparing special foods for invalids and convalescents. Only absolutely sterile gelatin should be used for medical purposes. Solutions for topical application range from 5 to 12 per cent, for subcutaneous or intramuscular injection not over 6 per cent, for intravenous use not over 2 per cent. Gelatin solutions may be used with dextrose, calcium gluconate or sodium chloride, or all may be used in combination, in hemorrhage. Gelatin is a reliable antibody stimulant.—W. F. DUTTON *Clin. Med. and Surg.*, 42 (1935), 165 (W. H. H.)

Glycerol—Mixed Esters of, with Aliphatic Acids and Phosphoric Acid. An ester derived from 1 molecule of glycerol and 2 molecules of an aliphatic acid is treated at about atmospheric

temperature with phosphorous oxychloride in the presence of an acid-binding agent, e g, pyridine and the product is poured into ice water to produce an acid ester of glycerol with phosphoric acid and the aliphatic acid. Examples are given of the manufacture of products from diolein, di stearolin, dicrotonin and dilaurin. The products and their salts are of therapeutic value.—F. HOFFMANN-LA ROCHE and Co. Ger. Pat. 608 074, Jan. 15 1935 (Cl. 12o 5 04). (S. W. G.)

Hexamethylenetetramine—Production of Medicinal, from Technical Product. The purification of technical hexamethylenetetramine is accomplished by using a solution of 95% alcohol mixed with charcoal and this is finally dissolved in water. For laboratory details see original article. The total yield was from 75–76% U. S. P. product and only 10–12% of the total yield was technical. The total loss during the process was only 12–15%. The quantity of alcohol recovered during the experiment was from 70–75%.—M. WOLPE. *Ssovet Pharmaz*, 5 Nr. 3 (1934) 33–34. *Wiss. prakt.-pharmaz. Inst. d. Leningrad Health Clinic*, through *Chem. Zentr.* 106 (1935), 926. (G. B.)

Lac—Constitution of. The composition of lac varies within certain limits depending among other things on the host plant, brood climatic conditions and the method of collection. Lac itself, however much purified, is never a chemical entity. Stick lac, that is the resinous incrustation as removed from the twigs, contains dead insect bodies, the lac dye and wax, as well as the true resin constituents. The lac resin consists of hydroxy acids of the aromatic and aliphatic series, two of these acids, alemitic and shellolic have been isolated and identified.—R. BHATTACHARYA. *J. Soc. Chem. Ind.*, 54 (1935), 82T. (E. G. V.)

Perfumes—Synthesis of. **Preparation of Methylene Ester of Pyrocatechol.** A study of the preparation of the methylene ester of pyrocatechol by the action of dichloromethane (instead of diiodomethane as generally used) on an alkaline salt of pyrocatechol. A mixture of 3 Gm. pyrocatechol, 2.4 Gm. dichloromethane, 1.6 Gm. caustic soda, 0.7 Gm. of water and 9 Gm. ethanol are heated for 15 to 18 hours on the water bath, yielding a dark liquid containing sodium chloride crystals. The liquid was steam distilled, the distillate extracted with ether, the extract washed with caustic soda solution and with water and then dried and the ether was evaporated. The amount of caustic soda used should be about 72% of that theoretically required to combine with the pyrocatechol, the best medium is 96% ethanol and the optimum temperature is 110° to 115° C. The maximum yield obtained was 23.2% of theoretical.—R. L. BACHRACH. *Maslo bojno. Zhivoe Delo*, 9 (1934), 42, through *Chimie & Industrie*, 33 (1935), 137. (A. P. C.)

Trisodium Periodate and Periodic Acid—Preparation of. Fifty grams of sodium iodate, 660 cc. of soda lye (density, 1.332) and distilled water to make up to 2000 cc. are introduced into a pyrex graduated container. The mixture is heated to 80°, stirred, and 80 cc. of pure bromine is introduced. The product is filtered, washed several times with 200-cc. portions of water and then dried. A crystalline compound of trisodium periodate (97–99% pure) is obtained. The periodic acid is prepared by first dissolving a weighed amount of trisodium periodate in excess normal nitric acid. In another container an equivalent amount of silver nitrate is dissolved in water and then the two solutions are mixed. The resulting periodate of silver is washed, placed in a container with water warmed to 70° and bromine is added until a light yellow precipitate results upon agitation. The precipitate is separated, and washed. The washings and mother liquor are combined and evaporated partly with concentrated sulphuric acid, and finally pieces of soda are added. The periodate is removed and appears as a light yellow solid.—J. LANGE and R. PARIS. *J. pharm. chim.*, 21 (1935), 403. (M. M. Z.)

BIOCHEMISTRY

Anterior Pituitary—Studies on the Thyrotropic Hormone of. Changes in metabolic rate of a group of rats injected with large doses of a purified extract of thyrotropic hormone were followed. A rise in metabolic rate occurred during the first week of injections reaching a peak of plus 28 per cent; the metabolism then dropped to the preinjection value by the second or third week and continued to fall going as low as minus 29 per cent by the fifth week. The microscopic appearance of the thyroid at this stage of treatment resembled that of the untreated hypophysectomized animal. The pituitary gland of the animals injected with thyrotropic hormone for a long period of time gave a negative response when tested for the presence of thyrotropic hormone although they still contained the growth hormone. In studying the nature of this apparent resistance to the thyrotropic hormone it was found that the serum of animals which had been injected for a long period of

time with thyrotropic hormone contained a substance that is capable of inhibiting the action of thyrotropic hormone. The serum from these rats when given in doses of 0.5 to 1.0 cc twice daily for three days to hypophysectomized rats, prevented a rise in metabolic rate with amounts of thyrotropic hormone equal to 200 times the minimum effective dose. A similar finding was obtained when normal rats and guinea pigs were used as the test animals. The injection of thyrotropic hormone to a horse for a period of four months was found to produce the antithyrotropic substance in the horse's serum after the first month. Extracts of the antithyrotropic serum of the horse were prepared which, when given in doses of 0.4 cc, were capable of inhibiting the action of 100 units of thyrotropic hormone in the normal rat. Larger amounts of the extract, up to 4 cc daily, not only inhibited the action of 100 units of thyrotropic hormone injected into normal rats but at the same time apparently inhibited the thyrotropic hormone of the animal's own pituitary gland, causing a fall in metabolic rate to minus 24 per cent, which is the metabolic rate of the hypophysectomized animal. The antithyrotropic substance appeared to be unstable and boiling at p_H 5 for 3 minutes completely destroyed the inhibitory substance. The extract was also found to lose a considerable degree of its potency when kept in sterile ampuls in a refrigerator for two months. When kept at room temperature, the potency was entirely lost after this time. The discovery of this inhibitory substance is believed by the authors to provide the explanation for the numerous negative reports on the clinical use of the thyrotropic hormone. The nature or mechanism of action is discussed.—J. B. COLLIP and E. M. ANDERSON. *J Am Med Assoc*, 104 (1935), 965 (M. R. T.)

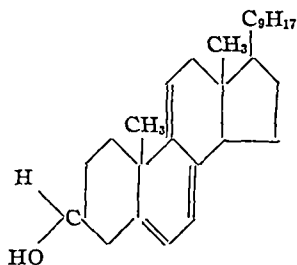
Cow's Milk—Antirachitic. Comparative Study of Antirachitic Value of Irradiated Cow's Milk and of Milk Produced by Cows Fed Irradiated Yeast. Thirteen rachitic infants, after a preliminary treatment-free observation period during which the activity of the rachitic process was established, were divided into groups that were fed 720 cc or 480 cc daily doses of cow's milk made antirachitic either by irradiation or by feeding irradiated yeast to cows. The infants were housed in hospital wards or rooms. Roentgenograms were taken weekly and determinations of the calcium, inorganic phosphate and phosphatase levels in the blood serum were made usually every two weeks and only occasionally at intervals of 1 or 3 weeks. On the basis of the data collected in this study, it is concluded that there is for rachitic infants no practical difference in antirachitic efficacy between cow's milk made antirachitic on the one hand by irradiation and on the other by feeding cows irradiated yeast when the same amount of the antirachitic factor is administered, as represented by an identical number of Steenbock rat units per day. The antirachitic factor in both milks in an amount assayed to equal 40 Steenbock rat units per day was able to produce satisfactory healing in the blood in from 49 to 61.7 days and in the bone in from 10.5 to 11 weeks. The antirachitic factor in the yeast milk in an amount assayed to equal 27.5 Steenbock rat units per day also was able to bring about satisfactory healing in the blood and in the bone. However, the period of time required to bring about this result in the blood was on an average 118 days (from 74 to 155 days) and in the bones on an average 21.2 weeks (from 16 to 24 weeks), indicating, therefore, that for the rachitic infants tested in this study the dose of 27.5 Steenbock rat units per day was very close to the actual minimum amount required for the ultimate healing of the active rickets.—H. J. GERSTENBERGER, *et al*. *J Am Med Assoc*, 104 (1935), 816 (M. R. T.)

Ascorbic Acid—Total, Content of Human Blood. Method of Determination. Mix 5 cc of oxalated blood with 5 cc of 10% trichloroacetic acid, shake and add 5 cc 16.6% mercuric acetate. After 5 minutes add 0.25 Gm calcium carbonate and centrifuge. Treat thoroughly with hydrogen sulphide. After 18 hours, remove the hydrogen sulphide with a stream of nitrogen. Use for titration a solution of 2.6 sodium dichlorophenolindophenol (25 mg in 50 cc) so diluted that 12 cc is equivalent to 1 mg of ascorbic acid as determined by a standard. Add 1 cc 10% acetic acid to 5 cc of the hydrogen sulphide-free filtrate and titrate into 0.1 cc of the indicator solution. The values in normal individuals are between 1.19 and 2.66 mg %.—I. ARTHUR MIRSKY, S. SWADESH and S. SOSKIN. *Proc Soc Exptl Biol Med* 32 (1935), 1130 (A. E. M.)

Dietetics—Some Aspects of. Acidosis, diabetes, constipation and infant feeding are dealt with briefly in this article.—*Pharm J*, 134 (1935), 259 (W. B. B.)

Ergosterol. By studying the peroxides of ergosterol and dehydroergosterol obtained by the action of oxygen in the presence of light and a sensitizer as well as their transposition products

it has been ascertained that dehydroergosterol has two double bonds in the same position as in ergosterol



M MULLER *Z physiol Chem*, 231 (1935) 75, through *Squibb Abstract Bull*, 8 (1935), A-362

Etrones—Separation of, from Urine Isolation of α -Folliculin from Urine of the Horse The α -folliculin obtained from the urine of the horse m 262° (corrected), $[\alpha]$ 190 in chloroform = +158.4° The hormone is identical with the international standard of folliculin and that from pregnant women The benzoate m 217.5° and on resolidification m 204–205° The color reactions described by Schwenk and Hildebrandt *S A B* 6 (1933), 445 for β folliculin were also obtained with α folliculin and the international standard Both the latter in doses of 0.3 γ in oil solution produced estrus in 8 of 15 rats —V DEULOFEU and J FERRARI *Compt rend soc biol*, 118 (1935) 588, through *Squibb Abstract Bull* 8 (1935) A-464

Ovarian Follicular Hormone—Crystalline The hormone obtained from hog ovaries seems to be identical with dihydro theelin The m brombenzoate has a melting point of 154–155°, as compared with 155–156° found with the analogous compound prepared from pure dihydro theelin The hormones obtained by saponification of the latter compounds have an identical melting point of 170–171° —D W MACCORQUODALE, SIDNEY A THAYER and EDWARD A DOISY *Proc Soc Exptl Biol Med*, 32 (1935) 1182 (A E M)

Gastric Secretions The latest biological theory concerning the gastric secretions is that histamine or a salt of it is formed in the wall of the stomach and causes an outpouring of secretion It is probable that histamine is derived from food in contact with the stomach lining The same result would follow from a persistent salt-free diet The present craze of tablet taking is to be discouraged If a tablet of an anhydrous chemical lay in contact with the moisture laden tissue of the stomach it exerts a severe hygroscopic effect Powders are to be preferred over tablets but neither should be taken on an empty stomach The use of sodium bicarbonate in dyspepsia is popular, but fallacious It is useful not in acidity, but when the acid is already low for it dissolves the mucous and stimulates secretion Magnesium hydroxide and bismuth carbonate given a fair time after food are effective in reducing acidity Acids should also be given a fair time after foods —B R BRAMWELL *Pharm J*, 134 (1935) 268 (W B B)

Gonadotropic Hormones A Szarka (*Orvos Hetilap* Nov 1934, page 1009) using Evan's technique established that by augmenting the anterior pituitary hormone with a hormone prepared from amnion a still greater gonadotropic activity was secured With a modified technique a combination was finally established (0.45 anterior pituitary lobe 0.5 placenta, 0.05 part hemolyzed pregnant blood) which appears to have properties greatly resembling those of the pituitary hormone yet surpassing this in luteinizing activity and differing somewhat from the urinary hormone —*Brit Med J* 3873 (1935), 54 (W H H)

Hormones Endocrinology A survey of the present knowledge of endocrinology is presented This covers the hormones of the thymus pituitary thyroid pancreas parathyroid and adrenals and the sex hormones their source action and clinical use —R DENISON *Pennsylvania M J* 38 (1935), 313, through *Squibb Abstract Bull*, 8 (1935) A-402

Hormones and Lipoids—Separation of Substances containing complex albumin lipid hormone compounds, e g glands gland extracts, blood and aqueous fruit extracts are treated with an organic solvent capable of decomposing the complex compounds e g, alcohol or acetone and also with an adsorbent e g active aluminum oxide active carbon or silica gel, whereby the albumin is precipitated, the lipid is adsorbed and the hormone remains in solution Further concentration of the lipid and the hormone can then be effected in known manner Special

processes are described —G PERITZ and C BRAHM Ger Pat , 608,414, Jan 23, 1935 (Cl 12p 17 10) (S W G)

Insulin—Purification of Method for Precipitation of A 0.2% aqueous solution of potassium ferrocyanide precipitated insulin quantitatively from acid solution since filtrates from such precipitates were entirely inactive and the precipitates contained all the activity as determined by biological tests. Also, the filtrates treated with picric acid gave inactive precipitates which doubtless represented impurities. This occurred even with insulin containing 20 international units per mg. The potassium ferrocyanide insulin precipitate (Ferrinsulin) (I) when prepared from the purest commercial insulins was light blue in the dry condition, but a deeper blue when prepared from more impure commercial preparations. Thus the blue color was due to impurities. I was insoluble in water and dilute hydrochloric acid but soluble in 2% sodium phosphate or ammonium phosphate. This reaction afforded not only a means of purifying insulin but of determining *in vitro* the purity of a given preparation. For example, a sample equivalent to 100 units of an insulin supposed to contain 20–22 international units per mg. should give approximately 5 mg. of I. The amount of potassium ferrocyanide needed to precipitate 100 units was less than 1 cc., but excess of the 0.2% reagent had no effect on precipitation. However, with more concentrated solutions of reagent (10%), excess dissolved some of the precipitated I—I I NITZESCU and S SECAREANU *Bull soc chim biol*, 17 (1935) 118, through *Squibb Abstract Bull*, 8 (1935), A-403

Lecithins—Use of, in Nutrition, Etc This review covers the chemistry of lecithins as well as their use in foods, etc. Twenty two papers most of which have been published since 1930 are quoted from at considerable length. Analytical data is presented mostly in tabular form. The compilation of information is both concisely and logically presented —E I VAN ITALLIE *Pharm Weekblad*, 72 (1935), 238–246, 296–304 (E H W)

Liver—Effect of Autolysis on Potency of, in Treatment of Pernicious Anemia Case evidence is submitted which shows that both experimental and commercial autolysates of liver have less hematopoietic activity against pernicious anemia than amounts of liver from which they were derived. This was contrary to the observations of Herron and McElroy reported in 1932 which suggested that autolysis markedly increased the potency of liver in the treatment of pernicious anemia —W B CASTLE and M B STRAUSS *J Am Med Assoc*, 104 (1935), 798 (M R T)

Liver Extract—Charcoal Adsorption as a Method for the Preparation of Concentrated. A method for the preparation of liver extract based on the property of the hematopoietically active principle of becoming adsorbed by charcoal from an acid solution is described. This allows the concentration of the fluid to a small volume without much loss of potency —JEAN L KYER *Proc Soc Exptl Biol Med*, 32 (1935), 1102 (A E M)

Liver Extract—Preparation of The authors give a rather complete history of the use of liver extract. Analyses show the major constituents of liver to be somewhat as follows: water 72.0%, protein (N \times 6.25) 20.4%, fat 4.5%, carbohydrate 1.7%, ash 1.4%. None of these constituents, as such, is of interest in the manufacture of liver extract, but the finer constituents not indicated in such an analysis contain the active material. Cohn and his collaborators proved that the active principle was water soluble, and could be freed from liver protein by precipitation at the isoelectric point. By extracting the residue with ether they then separated all lipid substances, and finally separated an alcohol precipitable fraction. By treatment with basic lead acetate, all carbohydrates were eliminated, and still the active principle remained in the filtrate. The active principle has been shown to be precipitated by phosphotungstic acid and it is suggested that it is probably a nitrogenous base, though not a purine derivative. Investigation reached this point in 1930 and does not seem to have progressed since. The fresh liver, if to be stored for any length of time, has to be frozen immediately upon extraction from the animal and held at 20° F or below to prevent deterioration. It is then minced or finely ground and extracted by prolonged agitation with warm water. From the resultant mass, liver protein and heat coagulable protein are precipitated, and the liquor filtered off. The aqueous extract is then concentrated to a sirupy liquid by evaporation under high vacuum and treated with alcohol, which throws down the alcohol-coagulable nitrogenous matter which is filtered off. The alcohol filtrate is concentrated by vacuum distillation, and the concentration is further dried *in vacuo* until the moisture content has been reduced to below 3% —C P CALLISTER and H G OSBORNE *Australasian J Pharm*, 16 (1935), 32 (T G W)

Pituitary—Diabetogenic, Thyrotropic, Adrenotropic and Parathyrotropic Factors of A review of the literature concerning the several physiologic roles exercised by the pituitary —J B COLLIP *J Am Med Assoc*, 104 (1935), 916 (M R T)

Pituitary—Diabetogenic, Thyrotropic, Adrenotropic and Parathyrotropic Factors of 1 Diabetogenic Substance A review of existing evidence relating to the diabetogenic substance of the pituitary —J B COLLIP *J Am Med Assoc*, 104 (1935), 827 (M R T)

Resorcinol (Fructose) Reaction in Cerebrospinal Fluid Roe's method for determining fructose in blood, applied to spinal fluid, gives an average value of 4.1 mg per 100 cc. The reducing substance has the biological properties of fructose. The quantity found is in proportion with the glucose present. It is supposed that a product of rearrangement of glucose, as occurs under the influence of alkali, is responsible for the reaction —ROGER S HUBBARD and HELEN R GARBUTT *Proc Soc Exptl Biol Med*, 32 (1935) 986 (A E M)

Serum Iron—Method for the Estimation of The total iron in the serum is determined by ashing 2 cc with 2 cc of sulphuric acid and 30% hydrogen peroxide. It is diluted to 15 cc with water, oxidized with permanganate and shaken with 5 cc ethyl acetate and 5 cc of a 20% ammonium thiocyanate solution. The color of the ethyl acetate layer is compared colorimetrically with a standard containing 0.005 mg of iron. A blank test must be run besides. The iron corresponding to the hemoglobin dissolved in the serum is determined by the benzidine method. Mix 2 cc of the benzidine reagent with 0.5 cc serum, add 0.5 cc water and 1 cc 0.6% hydrogen peroxide. Prepare another test using 0.5 cc of a standard blood solution containing 0.05 mg of hemoglobin per cc instead of 0.5 cc of water. Reading is done after development of the color in the usual way. The blood protein present prevents full development of the color. The second test serves to determine the percentage of hemoglobin, and a corresponding correction is applied to the first test. Finally, the mg of hemoglobin per 100 cc are computed as micrograms of iron by multiplying by the factor 3.35 —FRANKLIN C BING and RAMON F HANZAL *Proc Soc Exptl Biol Med* 32 (1935) 1013 (A E M)

Sex Hormones—Female A general review is given. The clinical possibilities of follicular hormone (progynon) and corpus luteum hormone (proluton) are discussed —ANTONIO J SCHIAVO *Semana med (Buenos Aires)*, 42, 1 (1935) 819 (A E M)

Sex Hormones I Hormones of the Anterior Hypophysis A brief historical and chemical review of hormone literature, especially the hormones of the anterior hypophysis —C R ADDINALL *Merck Report*, 44 (1935), 4-6 (S W G)

Sex Hormones—Review of A detailed description of the changes involved in the process of menstruation, and a microscopic study of the development of a mature ovary and the stages in the production of a mature ovum is given. The origin and impulse for the profound changes in the uterus were first sought in the nervous system, but it was soon realized that the ovary was the causal factor. There follows a presentation of the several hormones as to their source, production, chemical constitution as far as is known, effects which they produce, and the units for tests which have been established. The hormones taken up are the follicular hormone, the corpus luteum hormone, the anterior and posterior lobe pituitary sex hormones, other hormones of the pituitary, and the interrelationship of the various endocrine glands. Some results of clinical use of some of the sex hormones are given —R JOACHIMOVITS *Scientia Pharm*, 6 (1935) 25 (M F W D)

Testicular Hormones Clarification of Constitution of Androsterone. Explanatory and critical data on the work of R. *et al*, Cook, *et al*, and Butenandt *et al* regarding the structural formula of androsterone. R. *et al* maintain that their synthesis of androsterone is the first unequivocal proof of the derivation of a sex hormone from a sterol —L RUZICKA, M W GOLDBERG and H WIRZ *Helv Chim Acta* 18 (1935) 61 through *Squibb Abstract Bull*, 8 (1935), A 378

Vitamin A—Effects of Cottonseed Meal on Stability of, in Cod Liver Oil Since cottonseed is known to contain antioxidant substances capable of protecting the oil against rancidity, and common experience shows that this protection applies to the residual oil in cottonseed meal, the latter suggests itself as a possible factor in controlling the keeping quality of cod liver oil and in preserving vitamin A in mixed feeds. This preservative effect is obtained in high degree only by intimate mixing of cod liver oil with the meal. Feeding points are described which illustrate this fact —H G MILLER *Oil and Soap* 12 (1935) 51-52 through *Chem Abstracts*, 29 (1935) 2663

Vitamin B A brief review of literature dealing with vitamin B is given. A probable structure of the vitamin B molecule is pictured —ANON *Merck Report*, 44 (1935), 13-14 (S W G)

Vitamin B—Relation of, in Foodstuffs This work deals with the relationship between the B vitamins and the protein fat and carbohydrate content of the food. The author's investigations, conducted with white mice, led him to the conclusion that vitamin B₁ (+B₄) bears a quantitative relationship to the carbohydrate content of the diet, and that vitamin B₂ bears a similar relationship to the fat content of the diet and probably also to its protein content.—P. VOGT-MÖLLER *Lancet*, 228 (1935), 275 (W. H. H.)

Vitamin B₁—Method for Obtaining Vitamin B₁, which has been adsorbed by an adsorption agent such as fuller's earth, may be removed by the use of hydrochloric or sulphuric acid solution of a concentration of at least 5%. Use of alcohol with the acid facilitates the removal, and the acid solution obtained may be partially neutralized to a p_H of 5 to 7.—ELMER H. STUART (to Eli Lilly and Co.) U. S. Pat. 1,990,961, Feb. 12, 1935 (S. W. G.)

Vitamin Standards—International The Second International Conference on Vitamin Standardization adopted pure β carotene as standard for vitamin A, standards for vitamins B and D remain unchanged. *l*-Ascorbic acid has been adopted as standard for vitamin C, unit activity being defined as the vitamin C activity contained in 0.05 mg. of pure *l* ascorbic acid.—*J. Soc. Chem. Ind.*, 54 (1935), 289 (E. G. V.)

Vitamins—Standardization of Report of Second International Conference. At the second international vitamin conference in London (June 1934) the following standards were adopted: vitamin A, pure β -carotene, the international unit being 0.6 γ ; for vitamin B₁, the adsorption product prepared in the medical laboratory of Batavia, the international unit being 10 mg. of this product; for vitamin C, *l* ascorbic acid, the international unit being 0.05 mg.; and for vitamin D, the standard solution of irradiated ergosterol adopted in 1931, the international unit being 1-mg. solution which is equivalent to 0.025 γ crystals of vitamin D.—L. RANDOIN *Bull. soc. chim. biol.*, 17 (1935), 67, through *Squibb Abstract Bull.*, 8 (1935) A-374

ANALYTICAL

Alkaloidal Drug Extracts—The Air-Lift Extractor Applied to the Analysis of Since extraction of alkaloids from pharmaceutical preparations consumes much time, automatic devices have been suggested, but most of them are unsuitable because they depend on refluxing of the solvent by heat with possible decomposition of alkaloid and because of the difficulty of knowing when extraction is complete. The air extractor operates at room temperature and is provided with a stop-cock so that samples may be drawn off and tested. Following is the method: "The large tube of the apparatus is filled nearly to the overflow with chloroform; the preparation to be extracted is superimposed upon it and made alkaline with ammonia. A small quantity of chloroform is placed in the smaller tube, 40 cc. of 5% sulphuric acid is added and then chloroform until the top of the acid layer is almost to the inlet. The air (or nitrogen) is allowed to enter and extraction continued until all of the alkaloid is deposited in the acid layer. This point may be determined by removing a small quantity of chloroform solution through the stop cock at the bottom of the tube and testing it in the usual manner with Mayer's reagent. About four hours are required for the complete extraction of the alkaloid. The acid is then removed from the tube, the tube rinsed with water and the final extraction made with chloroform in a separator after making the acid solution alkaline with ammonia." A series of extracts checked against the U. S. P. X shows agreement within limits of experimental error.—L. D. SEIF and T. H. RIDER *J. Am. Pharm. Assoc.* 24 (1935), 267 (Z. M. C.)

Alkaloidal Salts—Titration of Use of Porrier Blue as Indicator. The adoption by certain Pharmacopœias of titrimetric methods for the determination of purity and identity of alkaloidal salts led the authors to determine, by titration with 0.1N sodium hydroxide, the equivalence numbers (D. A. B. VI) of 28 alkaloidal salts. Estimations were conducted in different titration media: viz., water, water-alcohol, water-chloroform, chloroform-alcohol, alcohol and acetone, using phenolphthalein and Porrier blue as indicators. The limitations observed in the determination of equivalence numbers by following different titration techniques are discussed. Porrier blue is, in general, a more satisfactory indicator than phenolphthalein because of its sharp end point, but it cannot be used for the titration of all alkaloidal salts. Porrier blue was shown, by analysis of three specimens, to possess a variable composition. Photometric and light absorption studies indicated decided color instability on the alkaline side but greater stability over the acid p_H range.—E. REIMERS *Arch. Pharm.*, 273 (1935) 140 (L. L. M.)

Alkaloids—Quantitative Determination of, with Bromine Previous workers had shown that small amounts of quinine and some other alkaloids could be estimated quantitatively by means of an aqueous bromine solution, the method depending on the absorption of the bromine the end-point being disappearance of yellow color. These reports indicated the method to be inapplicable to atropine, cocaine, morphine, sparteine and some others. In the present study the investigation has been carried further. The general method of procedure is given in detail and also two modifications. Consideration has been given to a number of factors. Time of reaction varies greatly. Addition of chloroform, which may be useful sometimes, requires only a brief time. Addition of apomorphine gives more satisfactory results in cases of very low concentration and the reaction is very rapid. Sulphuric acid accelerates the reaction in some cases. Concentration of bromine solution and of hydrochloric acid as well as concentration of solution to be tested were studied. Volatilization of bromine is negligible with rapidly acting substances but requires consideration for slowly acting ones and means of minimizing this loss are reported. Nature of light and background were considered. Cloudiness in chloroform occurred sometimes from unknown causes so, little valuation can be put upon it. Results presented were based on thousands of test-tube examinations. A short description is given for each of the following: amidopyrine, antipyrine, apomorphine hydrochloride, brucine sulphate, caffeine, codeine sulphate, cinchonidine and cinchonine, dionine, emetine, morphine sulphate, procaine and tutocaine, quinine and quinine strychnine sulphate, theobromine, picrotoxin, salicin, salicylic acid. Koppeschaar's Solution was used and in general the error was about 0.5% in concentrations of about 1-1000. The error in estimation of substances in solutions of unknown concentration increases with the dilution but some may be determined in concentrations of 1-1,000,000 with 5 to 10% error. Estimations are made with controls in which attention must be paid to concentration, temperature, rate of reaction and other factors discussed in the paper.—ROBERT A. HATCHER and ROBERT L. HATCHER. *J Am Pharm Assoc*, 24 (1935), 262 (Z M C)

p-Aminobenzoic Acid—Determination of Esters of The author describes a method for the gravimetric determination of p-aminobenzoic acid. The acid as such, or that obtained by saponification is diazotized and coupled with beta-naphthol. The resulting substance (beta-naphthol 1-azo-4-p-aminobenzoic acid) which is soluble in water acidified with hydrochloric acid may be collected, dried at 100° and weighed. When the acid must be obtained by saponification (cycloform and novocaine) one boils with sodium hydroxide and separates the resulting impurities from the acid by shaking with chloroform. The alkaline solution or the acid solution (after acidifying) may be thus shaken out. In both cases the aminobenzoic acid remains in the aqueous portion.—I. FLODERER. *Ber Ungar Ph Ges* (1935), 314, through *Pharm Weekblad*, 72 (1935) 397 (E H W)

Analytical Methods—Notes on Some, with Special Reference to Their Teaching Value The paper draws attention to some recent methods of volumetric analysis which should be recommended for teaching purposes. Notes are given on the subject of adsorption indicators, such as soluble fluorescein, eosin and dichlorofluorescein. The volumetric method for the assay of sodium sulphate is discussed. For commercial purposes, the gravimetric method seems to be satisfactory but the method of Rivett (*Chem News*, 118 (1919) 253) serves better as a teaching method. The procedure is as follows: Weigh out about 4 Gm. sodium sulphate, dissolve and add to an excess of recently precipitated barium oxalate, heat on a water bath for 10 minutes. Transfer to a 250 cc flask, cool, make up to volume and titrate aliquot portions of the filtered liquid. The author advocates the use of titanous sulphate in place of titanous chloride for teaching purposes, as the chloride oxidizes so rapidly.—A. T. S. Sissons. *Australasian J Pharm*, 16 (1935) 180 (T G W)

Ascorbic Acid (Vitamin C)—Sensitive Spot Reaction for The principle of the reaction is the reduction of potassium ferricyanide by an acid solution of ascorbic acid and the conversion of the resulting potassium ferrocyanide to Prussian Blue. **Solutions**—(1) 8% acetic acid, (2) ferric sulphate solution. One gram of C.P. anhydrous ferric sulphate is dissolved by boiling with 80 cc of distilled water and 18 cc of 85% phosphoric acid. A 1% solution of potassium permanganate is then added dropwise to the appearance of a weak rose coloration. The solution is boiled for several minutes and diluted, after cooling, to 100 cc, (3) 0.4% potassium ferricyanide solution. The ferricyanide must be chemically pure and free from ferrocyanide. **Test**—Macerate several grams of the plant or organ tissue with a two- or threefold quantity of hot 8% acetic acid

in an Eprouvette with a glass tube having a pointed edge One drop of the acid extract is placed upon a double filter, the second filter paper being used for the test One drop of the ferricyanide solution is placed upon the filtered drop and then a drop of the ferric sulphate solution is added In the presence of not less than 0.003 mg of ascorbic acid per 0.05 cc, a blue coloration is produced within one half minute If the coloration does not appear within one minute the test must be regarded as negative Urea does not interfere, sugar solutions interfere only after boiling with alkalis Large quantities of cysteine, glutathione and pyrogallol interfere, but usually not in the quantities in which they occur in the tissues In important cases the chemical test should be confirmed by the biological method For a quantitative determination, cf H Tauber and I S Kleiner, *J Biol Chem*, 108 (1935), 563 —H TAUBER *Mikrochem*, 17 (1935), 111 (L L M)

Carbon Tetrachloride—Determination of, in Chloroform The Danish and Swiss Pharmacopœias are the only two which aim to eliminate the impurity, carbon tetrachloride from chloroform The amount of carbon tetrachloride is determined as follows 20 Gm of chloroform is fractionally distilled in a round bottom flask until there remains only 1 cc One gram of this is shaken with 150 Gm of water until completely dissolved The assay is based on the difference in boiling points of chloroform (60–62°) and carbon tetrachloride (76–77°) and on the difference of solubility in water The sensitivity of this assay is given by the Danish Pharmacopœia as 2% of impurity If 3% or more impurity is present, a cloudy liquid is obtained This method is rapid and effective —M E H MADSEN *J pharm chim*, 21 (1935), 246 (M M Z)

Castor Oil—Solubility of Distribution Coefficient between Oil and Water of Substances Completely Miscible in Two Solvents The distribution coefficient of methyl alcohol was determined in the system castor oil and water by determination of the alcohol in the water before and after agitating with the oil and was found to be 0.12, a slightly smaller value than that obtained for ethyl alcohol, 0.15 With acetic acid the technique consisted in determining this alkalimetrically and directly in the water before and after agitation with the oil using a *N*/60 solution of sodium carbonate of which 1 cc corresponded to 1 cc of acid, with the indicator phenolphthalein The coefficient of distribution of acetic acid remained constant for a given concentration and varied little but irregularly with the concentration At 0.1–0.25%, the value lay between 0.216 and 0.239, and at 10% was equal to about 0.2 Thus the values for the distribution coefficient of acetic acid and methyl alcohol are not similar, though both possess the characteristic of miscibility with water and with castor oil —A LINDENBERG *Compt rend soc biol*, 118 (1935), 441, No 5, through *Squibb Abstract Bull*, 8 (1935), A-459

Chromium Pigment—Micro-reaction of Chromate and bichromate give a violet coloration passing over to red with a 1% solution of strychnine in concentrated sulphuric acid Trivalent chromium ion must be oxidized to chromate before the color test is given Hydrogen peroxide may be used as the oxidant The reaction is carried out by the spot method The limit of sensitivity is 0.98 microgram CrO_4^{--} corresponding to 0.348 microgram of chromium Interfering ions are manganese, cobalt, ferricyanide and ferrocyanide, although their effects may be removed by suitable precautions —S AUGUSTI *Mikrochem* 17 (1935) 17 (L L M)

Citrus Oils—Value of Ultraviolet Fluorescence as Test for Determination of Substances Producing the Fluorescence An attempt recently made by E Bottini to determine the substance or substances responsible for the magnificent fluorescences shown by citrus oils exposed to ultraviolet light and examined under suitable conditions His results are presented in *Annali della Sperimentazione Agraria*, 15 (1934), 61–78, published in Rome He gives brief descriptions of the colors excited by ultraviolet rays falling upon intact fruits of orange, lemon, mandarin, bergamot, cedrat and grapefruit His principal interest was to trace the substances responsible for the fluorescence, and for this purpose he used the pure essential oils of mandarin, sweet orange, bergamot and lemon at three concentrations: undiluted, and diluted with absolute alcohol to contents of 0.17 and 0.0034 per cent of oil Spots on porcelain showing the various colors are listed The next step was to place drops of the same four oils at the same three concentrations upon filter paper and to examine their fluorescence in that condition The colors thus obtained were not quite the same as those obtained upon porcelain, owing to the varying diffusibilities of constituents of the oils He discusses the substances responsible for the intense blue fluorescence of the four oils named when these are examined under ultraviolet light This report is of special interest to perfumers —HUGH NICOL *Perf and Ess Oil Rec*, 26 (1935), 85 (A C DED)

Copper—Modified Iodimetric Method of Determining The weighed sample of copper is

dissolved in nitric acid, 5 cc of 6*N* sulphuric acid is added and nitric acid removed by evaporation. After dissolving in 20 cc of water, 2-3 Gm of potassium iodide is added and the titration with sodium thiosulphate carried out as usual till most of the free iodine is exhausted. After adding starch solution, the titration is continued nearly to the end point and approximately 2 Gm of ammonium thiocyanate is added and dissolved by thorough stirring. The blue color deepens. Titration is continued to a sharp end-point, the precipitate turning white.—H W FOOT and JOHN E VANCE *J Am Chem Soc*, 57 (1935), 845 (E B S)

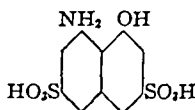
Copper—Potentiometric Estimation of The estimation of copper in the form of copper sulphate in sodium acetate acetic acid buffers previously described (*J*, 10 (1932), 41) can be carried out without the addition of free acid. This obviates the judging of the proper amount of acid to be added before titrations. The most suitable range for making up the copper sulphate solutions is between p_H 3 and 6. Above p_H 6, the error rises rapidly. The potentials at the end point have been found to rise with the p_H .—C PRASAD and J B JHA *J Indian Chem Soc*, 12 (1935), 1, through *Squibb Abstract Bull*, 8 (1935), A-501

Copper—Use of Potassium Stannous Chloride in the Volumetric Determination of A volumetric method of determining copper is described. The method is based upon the reduction of the copper in hydrochloric acid solution in the presence of sodium bicarbonate (to produce an atmosphere of carbon dioxide) with an excess of potassium chlorostannite and titrating the excess reagent with 0.1*N* iodine solution. The error in the determination of 0.02 Gm of copper as copper sulphate was 0.4%.—EMM VOYATZAKIS *Bull soc chim, mem* (5), 1 (1934) 1356, through *Squibb Abstract Bull*, 8 (1935), A 532

Cupric and Ferric Ions—*p*-Aminophenol Hydrochloride as a Reagent for A 2% alcoholic solution of *p* aminophenol hydrochloride gives with cupric and ferric salts a blue-violet precipitate. The reaction may be applied macro or microchemically (as a spot method). As limits of sensitivity were found. Cupric ion macromethod 0.15 mg, micromethod 0.2 γ , Ferric ion macromethod 0.013 mg, micromethod 0.069 γ . Other ions do not interfere. The coloration is intensified by acetic acid. The precipitates are apparently complex salts.—S AUGUSTI *Mikrochem*, 17 (1935) 118 (L L M)

Derris Root—Determination of Rotenone Content of A critical study of the polarimetric method of Danckwört and a modified Roark method. The former gives the lower values. In the opinion of the author a standard method worthy of adoption has not appeared as yet.—P A ROWAN *Arch Pharm* 273 (1935), 237 (L L M)

Diothane Solution—Stability of II It was reported previously that prolonged aging or heating of diothane solutions caused slight decomposition, the substance formed being either an aminobenzoate formed by rearrangement or aniline formed by hydrolysis. A detailed study of the hydrolysis of diothane using alcoholic potash has shown that aniline is formed. When diothane solutions are diazotized and coupled with beta-naphthol, the color is concentrated upon the precipitate of diothane free base so that small amounts are detectable but quantitative color comparison is difficult. The standard colorimetric procedure for aniline (use of bleaching powder) proved inapplicable. Color was not sufficient for quantitative comparison when the reaction was potentiated with phenol. A diazotization has been developed using H acid instead of beta



naphthol. Carried out in presence of alcohol it proved very sensitive, concentrations as low as 1 10 000 000 can be detected qualitatively. Details of procedure are given and results of a number of experiments are tabulated and discussed. It was found that maximum concentration produced by sterilization is 1 20,000 in unacidified solution 1 30 000 in acidified. Ordinary solutions show 1 350,000 too slight a change to affect potency. Addition of acid inhibits formation of aniline. So long as diothane solution is colorless and clear anesthetic potency is unchanged. If cloudy or colored it should not be used.—E S COOK, K BAMBACH and F H RIDER *J Am Pharm Assoc*, 24 (1935) 269 (Z M C)

Drugs—Quality of In a report from the government medical stores at Amsterdam covering the year 1934 the author states that most of the samples examined met the required standards

About a score were rejected. Some of the samples were as follows: Aniline—too low a boiling point, potato starch—20.2% water (max. allowed 16%), lactic acid—sp. gr. too low (1.197), low grade, sodium acetate—sublimation test gave a precipitate, the permanganate test remaining negative, aqua ammonia (25%)—contained lead, ether for anesthesia—gave a strong Nessler reaction even though the ether was preserved with copper, benzol—sp. gr. too low (0.881), $N_{20}^D = 1.501$, contains carbon disulphide and thiophene, magnesium carbonate—contained too much calcium, reduced iron—contained zinc, powdered iron—contained copper and arsenic, bismuth subgallate—contained too much nitrate, calcium sodium and potassium, gelatine—several samples were refused on positive sulphur dioxide reactions, papaverine hydrochloride—contained morphine, oil chaumoogra—rotation, etc., was satisfactory but the oil was not soluble in two volumes of absolute alcohol, oil gaultheria—was methyl salicylate, zinc oxide—contained lead, pastilles mercury oxycyanate—underweight, mercuric cyanide content 40.7% (req. 41%), tin (powdered) and tin oxide—contained lead, aluminum sulphate—did not meet the solubility requirement in water, talcum—contained 16% hydrochloric acid soluble material. The author also discusses the methods of analysis used.—T. ROSEBOOM *Pharm. Weekblad*, 72 (1935), 392.

(E. H. W.)

Dulcin Sweetening Agents. II—Microchemical Studies of The authors compiled a table of the solubility of dulcin in different liquids from the literature reports and from determinations made by themselves. They determined solubilities in trichloroethylene, tetrachloromethane, dichloroethylene, ethyl ether, petroleum ether and in mixtures of trichloroethylene with methyl alcohol and ethyl alcohol. The Jorissen reaction is inhibited by fats and resins such as exist in beer and is made uncertain by the use of lead peroxide which, in large quantities, masks the color developed and which, in small quantities, is responsible for a violet coloration. Cerium acetate and benzoyl peroxide were found to be superior to lead peroxide as oxidants. For the detection of dulcin, the following procedure was followed: One hundred cc. of the suspected liquid are clarified with 10 cc. of saturated copper sulphate solution and 20 Gm. of dry slaked lime, after which the precipitate is filtered off and washed with about 30 cc. of water. The filtrate is neutralized with acetic acid, made slightly alkaline with excess sodium hydroxide, again filtered, then extracted three times with 50 cc. of ethyl acetate, the aqueous layer having been saturated with sodium chloride before the last extraction to salt out the dissolved ethyl acetate. The ethyl acetate is removed by distillation, the residue dissolved in 2–3 cc. of alcohol and the solution, which has been transferred to a small evaporating dish, is mixed with a knife point of yellow lead oxide. The mixture is taken to dryness on a water-bath, then stirred with a glass rod and finally dried again on the water-bath. The powder thus obtained is extracted with three 5-cc. portions of ether, the combined ether extracts are filtered, the filtrate is collected in a test-tube and evaporated to dryness. The residue is warmed with 1 cc. of water and 3 drops of Jorissen's reagent (4 Gm. yellow mercuric oxide dissolved in diluted nitric acid and to which diluted sodium hydroxide is added to form a distinct precipitate, the filtrate from the mixture being diluted to 25 cc.) are added. The solution is heated 3 minutes on a water-bath and 2 drops of cerium acetate solution are added (the acetate solution is prepared by dissolving 1 Gm. cerium nitrate or sulphate in acidulated water, then precipitating with excess ammonia, infusorial earth is added, the solids filtered off and washed well with water, the precipitate and filter are treated with 2–3 cc. acetic acid, filtered and diluted with the washings to make 50 cc.). In the presence of dulcin, a violet coloration results. Very often a yellow precipitate comes down on heating the test sample with the mercuric nitrate, in such cases it is advantageous to filter hot through a Witt plate and test the filtrate for dulcin. It is helpful also to add a drop of diluted acetic acid, whereby a portion of the precipitate remains dissolved and the reaction is more distinct. Benzoyl peroxide is a somewhat less sensitive reagent for dulcin than is cerium acetate. Heating dulcin in glacial acetic acid saturated with potassium nitrate gives a non-specific yellow coloration.—V. STANEK and P. PAVLAS *Mikrochem.*, 17 (1935), 22.

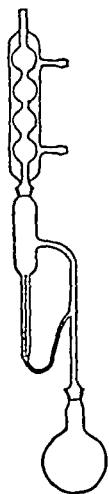
(L. L. M.)

Elektrargol, Kollargol, Argyrol and Protargol—Identification and Differentiation of Add 1 cc. of a 10% solution of sodium iodide to 2 cc. of the unknown solution, and then add 5 cc. of water and 10 drops of a 10% solution of saltpeter, and then add to this a solution of ammonium molybdate. The following results are noted: in the case of Kollargol, a reddish brown precipitate forms which changes immediately to dark blue; this color can be noticed in the supernatant liquid even after the precipitate has settled. With the same procedure we get a brown flocculent

precipitate with Argyrol which changes after 1 minute to bluish green and the supernatant liquid remains yellowish green. In the case of Protargol, the precipitate is yellow and sets much slower than in the case of Argyrol and the supernatant liquid is orange yellow. If sodium chloride or sodium bromide is used in place of sodium iodide then the colors of the precipitates are different and can be told apart among the samples used. Elektrargol can be told apart from Kollargol in that it does not change on the addition of a few drops of concentrated sulphuric acid while with Kollargol we get a brownish red precipitate. On addition of potassium persulphate to the Kollargol precipitate, we get a violet precipitate which finally dissolves, while the brownish solution of Elektrargol becomes a clear yellow solution. Further identity tests are given in the original article—G CONSTANTINESCU *Curierul farm*, 4 Nr 9 (Sept 1934), 4-8, *Chem. Multarzentralbl.*, through *Chem. Zentr.*, 106 (1935) 929 (G B)

Ether—Reaction for Peroxide in If 1-2 cc of ether is allowed to evaporate in a porcelain dish and 1 drop of alcohol, 1 drop of benzaldehyde and 1 drop of strong sulphuric acid added, an eosin red color will be developed if peroxide is present—A CASTIGLIONI *Ann. Chim. appl.*, Roma, 24 (1934), 209, through *Pharm. Weekblad*, 72 (1925), 336 (E H W)

Ethereal Oils—Estimation of, in Drugs An apparatus for the rapid approximate determination of ethereal oils in drugs is described. Twenty to 30 Gm of the drug is boiled for one hour with 200 cc of water. The steam containing the oil is condensed in a reflux condenser the condensate being collected in a measuring cylinder calibrated to $\frac{1}{20}$ cc. The volume of ethereal oil obtained is read off and converted by use of the average density of the oil to percentage by weight. The apparatus was found to give satisfactory results. Several sources of error are retention of droplets of oil in the lower part of the condenser, emulsification of the oil in water, and differences in the shapes of the upper and lower meniscus of the oil layer. If the content of oils as determined by the Geyer apparatus is 10% more than the required oil content, the drug may be assumed to be in conformity with the official requirement, otherwise the more accurate D A B VI method must be used—P HORKHEIMER *Pharm. Ztg.*, 80 (1935), 148 (G E C)



Ethyl Phthalate—Determination of, in Essential Oils by Potassium Phthalate Method Walbaum and Rosenthal have given a method for the determination of ethyl phthalate, based on saponification with caustic potash, filtering, drying and weighing the insoluble potassium phthalate, but did not specify the conditions of carrying out the determination nor the possibilities of interference by other substances. A plea is made for investigation of the reaction—SÉBASTIEN SABETAY *Ann. Fals.*, 28 (1935) 100-102 (A P C)

Extract of Malt The British Pharmacopœia directs that Malt Extract be made by extracting malted barley with water at a suitable temperature, and evaporation of the liquid under reduced pressure at a temperature not exceeding 55° C, until a viscous product is obtained. It is evident that an extract is desired in which the activity of the diastase has been preserved, but the Brit. Phar. does not set any standard for diastasic activity. Malt Extract intended for consumption in Australia, however, must comply with the Pure Food Regulations of the various states. The diastasic activity in all the states is to be such that 100 grains of extract will convert 250 grains of potato starch into maltose in 30 minutes at 40° C. The Malt Analysis Section of the Analytical Investigations Committee of the Australian Chemical Institute, has incorporated in the regulations an improved method for this determination of the diastasic activity. The chief points in this method are: the use of soluble starch; the control of the pH of the solution undergoing digestion by means of ammonium acid phosphate; an iodimetric method for estimating the sugars. It is doubtful, however, whether the standard for diastasic activity has any value, as analysis indicates that the action of this enzyme is almost completely inhibited at hydrogen ion concentrations prevailing in the digestive tract—F I ROSENBLUM *Australasian J. Pharm.* 16 (1935) 173 (T G W)

Gas Analysis—Micro Heat Conductivity Apparatus for Principles and construction of apparatus are explained and illustrated by diagrams—P GROSS and H STEINER *Mikrochem.* 17 (1935), 43 (L L M)

Glycerol—Determination of, in the Presence of Sugars, by Means of Periodic Acid Periodic acid reacts with glycerols oxidizing them to formaldehyde and formic acid, however since

periodic acid attacks sugars as well, it is necessary to first eliminate the sugars. With amounts of sugars such as 1-2% saccharose or 10% glucose, 1 Gm. of barium hydroxide is placed in a 50-cc flask with 5 cc. of the glycerol sugar solution, and the mixture placed in an ice chamber for two hours. This volume is then made up to 50 cc. with 95% alcohol, when a precipitate forms, and the flask again placed in the ice chamber for 15 to 20 hours. The mixture is then centrifuged for 2 or 3 minutes, and 25 cc. of the clear supernatant liquid is then withdrawn. This liquid contains the glycerol and very little sugar. The excess barium hydroxide is removed with 20% sulphuric acid and 25 cc. distilled water. This is heated at 95° until the volume is reduced to 20 or 25 cc. The solution is then neutralized with *N/10* sodium hydroxide. The glycerol can be determined as follows: 5 cc. of the solution is made acid with 5 cc. of *N/10* periodic acid. Five to 10 cc. of bicarbonate solution is added, as well as 15 cc. *N/10* arsenous acid solution and a small amount of potassium iodide solution. The excess of arsenous acid is titrated with *N/10* iodine. A method of calculation of glycerol, as well as a list of results checking this method are given. Where no sugars are present only the latter procedure is necessary for determining the glycerol.—P. FLEURY and M. FATOME. *J. pharm. chim.*, 21 (1935), 247 (M. M. Z.)

Hexamethylenetetramine—Determination of, in Its Anhydromethylene Citrate. The method is based on the solubility of hexamethylenetetramine in chloroform. Neutralize 0.344 Gm. hexamethylenetetramine anhydromethylene citrate with caustic soda in anhydrous methanol in presence of phenolphthalein. Add chloroform during neutralization, sodium anhydromethylene citrate precipitates, while hexamethylenetetramine remains in solution in the chloroform, after neutralization filter, extract the liquid several times with chloroform to obtain a total of 20 cc. of solution, evaporate the latter to dryness, dissolve the residue in 10 cc. of water, add 50 cc. of decinormal acid, boil 30 minutes, and titrate the excess acidity with decinormal alkali.—M. J. SCHULTE. *Aan P. van der Wielen* (1934), 99-108, through *Chimie & Industrie*, 33 (1935), 677-678 (A. P. C.)

Homeopathic Preparations. VI. Evaluation of Saponin-Containing Tinctures. Saponins are characterized briefly. Homeopathic saponin-containing tinctures are tested qualitatively and quantitatively for saponins. A table of 80 drugs is given, listing for each drug the part official, name of saponin, time for complete hemolysis, hemolytic index and characteristic constituents other than saponin. Frothing, hemolysis and the cholesterol reaction are used to test for saponins qualitatively. The hemolysis test is applied to tinctures as follows: the tincture is evaporated to dryness *in vacuo* and brought to the original volume with physiological salt solution. Defibrinated cattle blood is diluted 1 to 30 with physiological salt solution. Five cc. of this blood solution is mixed in a test-tube with 5 cc. of the alcohol-free tincture. The time for complete hemolysis is measured. A 0.1% solution of pure white saponin (Merck) is used as a control. All hemolysis tests are repeated after shaking out the saponin solution with a 3% acetone solution of cholesterol, these tests should be negative. Primary homeopathic tinctures and triturations of fresh plants with sugar are prepared and their saponin content determined. Results, recorded in a second table, show that the use of diluted alcohol in preparing tinctures increases the saponin content of extracts. The hemolytic index of extracts prepared with 25% alcohol is invariably raised.—A. KUHN and G. SCHAFFER. *Pharm. Ztg.*, 80 (1935), 257 (G. E. C.)

Hydrocyanic Acid—Determination of, in Plants. Hydrocyanic acid probably never occurs free in plants, but is combined with a sugar residue and an aldehyde or ketone to form a glycoside. The determination of the acid involves the decomposition of the glycoside and the separation and estimation of the acid. Only about 20% of the total glycoside is thus hydrolyzed. A suggested method is given involving the complete hydrolysis of the glycoside. The method employed has been to supply the deficiency of enzyme by the addition of emulsin taken from the sweet almond. The sweet almond is ground to a fine powder and tested before use for the presence of hydrocyanic acid by means of sodium picrate paper. The plant material is cut up with scissors or ground to a coarse powder. A quantity up to 20 Gm., depending upon the amount of acid thought to be present, is weighed, transferred to a distilling flask, the side tube of which is closed by a short piece of rubber tubing. About 250 cc. of distilled water and 5 Gm. of powdered almonds are added. The flask is stoppered and allowed to remain 24 hours at room temperature, and the contents are steam distilled, the distillate being collected in 100 cc. of 1% sodium hydroxide solution. After two hours, all the hydrocyanic acid is removed, and about 600 cc. of distillate have been collected. This is rendered slightly acid with concentrated hydrochloric, excess of sodium bicarbonate is

added, and the liquid titrated with standard iodine solution—H FINNEMORE and C H WIL
LIAMS *Australasian J Pharm*, 16 (1935) 40 (T G W)

Injections—Hydrogen-Ion Concentration in The disadvantage of colorimetric methods for determination of hydrogen ion concentration or p_H is that one person can match colors more accurately than another, and the presence of coloring matter in the substance of which the p_H value is to be determined causes difficulty, although there is a compensating apparatus for use in such cases. The electrolytic method is much more accurate and gives the correct p_H to two places of decimals. The p_H is of great importance in the preparation of pharmaceutical products. Insulin must be extracted in acid solution—it is destroyed if it comes in contact with pancreatin. If the p_H is kept just below 7 (slightly acid) adrenaline can be boiled and autoclaved, but if the p_H rises above 7 (alkaline) oxidation may set in, a color develop and finally a precipitate. Apomorphine oxidizes if the p_H is higher than 7 and a green color appears. A number of glucosides, such as strophanthin and digitalin are stable at about the point of neutrality, but on either side of this the rate of hydrolysis is increased. In sterilization p_H is important. The factors which affect the well-being of bacteria are food supply of water temperature and p_H . The p_H of the media in which bacteria are to be grown must be carefully adjusted. Some substances are best kept slightly alkaline while others are best kept in the acid condition—H BERRY *Pharm J*, 134 (1935), 214 (W B B)

Iodide Ion—Microchemical Investigation of The iodide ion may be detected by the two following spot reactions. (1) With an ammoniacal solution of mercuric ammonium nitrate (reagent of Cusa and Terni, 10 Gm of mercuric nitrate dissolved in 50 cc of water and 5 cc of nitric acid, with 60 cc of concentrated ammonia water then added to the mixture). A yellow or orange yellow precipitate is produced in the presence of iodide (Hg_2NI). The limit of sensitivity is 0.22 γ of iodine. (2) With a diluted solution of sodium hypochlorite and a 1% solution of magnesium sulphate (reagent of S. Augusti) a brown precipitate is produced. The limit of sensitivity is 9 γ of iodine—S AUGUSTI *Mikrochem*, 17 (1935), 113 (L L M)

Lard—Estimation of the Water Content of Various methods are considered with respect to ease of execution and rapidity. A suitable method for the rapid and approximate determination of the water content of lard is as follows. On solution of a 1.0-Gm sample in 5 cc of benzene at 20° C, lard containing up to 0.5% water gives a clear solution, lard containing 0.6% water gives a slightly turbid solution. Lards containing larger amounts of water give greater turbidity and lard containing 1.0% water gives a heavy milky turbidity—FRIDA GRAF *Scientia Pharm* 6 (1935), 42 (M F W D)

Lead—Identification of, in Pharmaceutical Preparations The weaknesses of several methods of determining lead qualitatively are pointed out. The method suggested by the authors depends upon the oxidation of the lead salt to lead dioxide which will give an intense blue color with an acetic acid solution of benzidine. Procedure. A drop of the solution to be tested is absorbed in filter paper. A drop of 3N sodium hydroxide added, then a drop or two of saturated bromine water, about two drops of ammonia solution (1:1) to destroy the excess oxidizing agent and the excess ammonia expelled by fanning over a flame and finally a drop of acetic acid benzidine solution is added. A deep blue color develops in the presence of lead. The test is sensitive to one microgram of lead or a dilution of 1 to 50,000. For more dilute solutions the test is altered as follows. About 10 cc of the solution to be tested are treated with 3 cc of sodium hydroxide. 2 cc of bromine water the mixture boiled and filtered through a quantitative filter, the filter washed with ammonia water then with hot water and an acetic acid solution of benzidine is dropped on. In the presence of 10 micrograms of lead in 10 cc or a dilution of 1 to 1,000,000 a definite blue color is obtained. The higher oxides of manganese and cerium would produce the same result, however these ions are not dissolved by the alkaline medium and they will not interfere. Thallium, if present could give the same color reaction. To test for lead in organic compounds the preparation is ashed the ash dissolved in nitric acid the solution evaporated to dryness and the residue warmed with water and sodium hydroxide the solution cooled, dropped on filter paper and the test completed as above. To test for lead in bismuth preparations the residue from ignition is dissolved in nitric acid, the solution evaporated, the residue boiled for two minutes with sodium hydroxide which converts bismuth salts to compounds probably of the formula $BiO(OH)$ then one or two drops of the supernatant liquid are absorbed in filter paper and the test carried out as before—F FEIGLE and A SINGER. *Scientia Pharm*, 6 (1935), 37 (M F W D)

Liquid Preparations—Scheme for the Identification of the Simple, of the British Pharmacopœia. The author gives a detailed description of a scheme, and charts by which many of these preparations can be identified —E M WATSON *Australasian J Pharm*, 16 (1935), 176 (T G W)

Meconic Acid—Colorimetric Determination of, in Opium by Means of Gradual Photometer Separate meconic anhydride from powdered opium by Haas's method by precipitation as lead meconate which is redissolved in 100 cc of decinormal hydrochloric acid (use 0.75, 0.5 or 0.35 Gm opium so as not to exceed the solubility of meconic acid in dilute hydrochloric acid), to 10 cc of the solution add 10 cc of water and 5 drops of 5% ferric chloride solution, compare the solution in a gradual photometer with a standard solution of meconic acid treated with the same quantity of ferric chloride. The light used is filtered through a green S53 filter. The accuracy of the method is of the order of 0.1% —C G VAN ARKEL *Aan P van der Wielen* (1934), 109-116, through *Chimie & Industrie*, 33 (1935), 675 (A P C)

Medicinal Agents—Standardization of III Particle Size and Degree of Dispersion of Important Medicinal Agents Many physico chemical properties of drugs are being more widely adopted as criteria of therapeutic value. Solubility and solution and absorption rates in the organism are dependent upon degree of dispersion. Another important consideration is the rapid increase in total particle surface as degree of dispersion is raised. Surface area determines the therapeutic utility of calomel, mercuric oxide, medicinal charcoals and clays. Cross sections, volumes and masses of individual particles, number of particles per mole and total surface area per mole are tabulated for a number of compounds either from direct measurement or by computation, m_2 , calomel, mercuric oxide, white precipitate and zinc oxide. Degree of dispersion was calculated from particle size (microscopic measurement) and experimentally determined values for specific gravities. Smaller particles of calomel having greater total surface area, are obtained than by the usual methods of production by chilling the vapors of sublimate suddenly. Likewise mercuric oxide is obtained in smaller particles by precipitation than by heating mercuric nitrate in the presence of metallic mercury. In the case of either compound, there is a parallel between particle size and pharmacological activity. Various existing methods for the determination of particle size within the colloidal range are summarized. Protargol (Bayer), silver proteinate (Heyden), Kollargol (Heyden) colloidal silver (Hageda), Lyogen (Byk Guldenwerke), Liquor Aluminii Acetici (D A B VI), Liquor Ferri Albuminati (D A B VI), and Liquor Ferri Oxichlorati dialysati were investigated by the method of Siedentopf and Zsigmondy —R DIETZEL and K SAXHOLM *Arch Pharm* 273 (1935), 170 (L L M)

Methanol—Methods for Detection and Determination of, in Natural Media and Liquids A critical review and study of existing methods for the oxidation of methanol and determination of the formaldehyde formed proved conclusively that conversion into formaldehyde is not quantitative, nor is it a constant fraction of theoretical yield, and that under certain conditions some formaldehyde is formed from ethanol. All existing methods are therefore unreliable for the quantitative determination of methanol, especially in presence of much larger amounts of ethanol (as most frequently occurs in natural media and liquids), but some of them are satisfactory for its qualitative detection. A new method based on essentially new principles has been developed and will be described in a subsequent publication —MICHAEL FLANZY *Ann Fals*, 28 (1935), 146-158 (A P C)

Microscopic Objects—New Method for Picking, Out of Water The method devised by Don Ernesto Caballero Bellido for the handling of diatoms under the microscope, which is suitable only for dried particles and therefore unsuitable for protozoa and the like, has been modified to make it applicable to the latter cases. Instead of using a single hair, a pair of microscopic 'tweezers' (called a 'microlab') is constructed by properly attaching two fine hairs to the end of a copper wire so that they project not more than 2 mm beyond the end of the wire. The technique of the preparation and use of the 'microlab' and the auxiliary equipment which has been devised in connection therewith, are described in detail —VENANCE *Naturaliste Canadien*, 62 (1935), 142-147, 153-164 (A P C)

Mineral Pigments—Systematic Method for Microchemical Identification of The method of differentiation is based upon the differences in behavior of the test samples with diluted nitric acid and upon the usual microchemical reactions for lead, calcium, etc. The following pigments were considered: white lead, chalk, zinc oxide, gypsum, lithopone, lead sulphate and barium sulphate —S AUGUSTI *Mikrochem*, 17 (1935), 1 (L L M)

Morphine—International Method for Its Determination in Opium A criticism of the method proposed by the International Commission of the League of Nations Grinding followed by screening may cause trouble in the case of moist opium In the assay of the extract adsorption of soluble substances by the insoluble residue can cause a loss, on the other hand, the extract, which contains an excess of lime, will absorb carbon dioxide during evaporation, the resultant errors, however, are of little importance No indications are given regarding the purity of the lime, it should be freshly slaked Use of sintered glass filters is unnecessary, as special filter paper is available for vacuum filtration The crystals which adhere to the cork stopper must be taken into consideration The morphine crystals on the filter should be washed with 10 cc of benzene to remove traces of codeine moreover, it is advisable to carry out the reaction in centrifuge tubes, the insoluble matter being separated by centrifuging and the determination carried out on an aliquot of the clear liquid, thus reducing the danger of adsorption —E C M J HOLLMAN *Aan P van der Wielen* (1934), 117-129, through *Chimie & Industrie*, 33 (1935), 678

(A P C)

Nitrogen—Simple Method for the Determination of The method can be used for various nitrogenous substances As applied to soil the procedure follows 10 Gm of soil are weighed into a flask of about 1 liter capacity Potassium dichromate (about 5 Gm) and mercuric oxide (about 2 Gm) are added and the mixture is treated with 15 cc of water Concentrated sulphuric acid (30 cc) is then added in convenient instalments with frequent shaking A liberal quantity of glass or quartz beads is added to the contents of the flask, which is fitted with an air or water cooled condenser and heated to gentle boiling for 30 minutes The digest is treated with 5 to 7 Gm of pure zinc dust, diluted to about 200 cc and boiled for 10 minutes It is then cooled and distilled with excess of alkali in the usual way —Y V NARAYANAYYA and V SUBRAHMANYAN *J Soc Chem Ind* 54 (1935), 106T

(E G V)

Ointments and Similar Preparations—Qualitative Examination of, by Means of Filtered Ultraviolet Light Rapid and simple qualitative tests could be made The natural colors and colors observed in ultraviolet light of 32 preparations of ointments in the Pharm Hung IV are reported Many commercial samples showed deviations from official prescriptions —ENDRE J KOCSIS *Magyar Gyogyszeresztud Társaság Értesítője*, 11 (1935) 99-106, through *Chem Abstracts*, 29 (1935), 2303

Olive Oils—Fluorescence of Influence of Pigments Olive oils, both "virgin" and refined, contain a group or constituent which produces a blue fluorescence under the action of Wood's light (filtered ultraviolet light of λ approximately 3650Å) There are also pigments, either pre-existent (in virgin oils) or added intentionally (in recolored refined oils) which produce an orange or red fluorescence which is superposed to the first-mentioned fluorescence Pigments (chlorophyll, xanthophyll, carotene, etc) have a decided absorbing effect on the fluorescence produced by the oil The fluorescence of any given oil is due to a superposition of the three above phenomena It is concluded that examination by ultraviolet light can be of some use as a rough sorting test, a decided blue fluorescence can be taken as proof that the sample is a refined oil, but otherwise no definite conclusion can be drawn from the test —J GUILLOT *Ann Fals*, 28 (1935), 75-78

(A P C)

Potassium Ion—Detection of, with "Gardinol W" This reagent an alkyl acid sulphate to which is assigned the formula $\text{SO}_3\text{OH C}_n\text{H}_{2n-1}$, gives a positive test for the potassium ion, but is less sensitive than sodium cobaltic nitrite —B REICHERT *Arch Pharm* 273 (1935), 232

(L L M)

Quinaldinic Acid as a Micro-reagent. II Estimation of Copper and Its Separation from Cadmium, Manganese, Nickel, Cobalt, Etc Phosphoric, arsenous and arsenic acids do not interfere with the estimation if the washing is carried out as described under the macro method (*Ztschr Analyt Chem*, 95 (1933) 400) The micro procedure was as follows The micro beaker and the filter stick, dried at 125° C was weighed in a Kuhlmann's microbalance A tiny crystal of copper sulphate was then introduced into it and the beaker with the stick weighed again The crystal was dissolved in 1-2 cc of water and the solution was acidified with one drop (0.025 cc) of 0.5-0.7N sulphuric acid The beaker was then warmed on the water-bath, and to the hot solution of the reagent (1 per cent solution of recrystallized quinaldinic acid) was added one drop at a time in the beginning gently rotating the beaker by the hand after the addition of each drop of reagent, and not adding the second drop till the crystals of quinaldinate settled to the bottom

When the precipitation was complete four drops of the reagent were added in excess, this amount being independent of the amount of copper present. The precipitate was allowed to settle for five to ten minutes by keeping the micro beaker in its stand on the water bath. The supernatant liquid was then drawn off through the filter stick, and the precipitate washed six times by decantation with hot water, keeping the beaker on the water bath all the time. Care should, however, be taken that no precipitate enters the filter-stick before the washing is complete, as the fine precipitate often chokes the filter, delaying filtration. Finally the contents of the beaker were sucked dry through the filter stick, and the beaker with the filter stick was then dried at 125° for 10-12 minutes in a slow current of hot air in the Benedetti Pichler drying apparatus. The beaker with the filter stick was afterward weighed in a microbalance with usual precautions. In an appended table the range of error is shown to be from -0.9 to $+0.75$ per cent.—P. R. RAY and J. GUPTA *Mikrochem.*, 17 (1935), 14 (L. L. M.)

Quinaldine Acid as a Micro-reagent I Estimation of Zinc, and Its Separation from Manganese The procedure followed was a micro adaptation of the macro method by the same authors (*Ztschr. Analyt. Chem.* 95 (1934) 400) for the estimation of zinc in the presence of manganese, magnesium alkaline earths phosphoric and arsenic acids. **Microestimation**—About 0.6-0.7 mg. of potassium zinc sulphate ($K_2SO_4 \cdot ZnSO_4 \cdot 6H_2O$) were weighed into a micro beaker and dissolved in 1-1.5 cc. of water. The solution was acidified with 1-2 small drops of glacial acetic acid, heated for a minute on a boiling water-bath and the zinc then precipitated hot as quinaldinate by adding dropwise a solution of quinaldine (1 Gm. of quinaldine acid per 100 cc.) in excess of the theoretical requirement by 0.2-1 cc. The solution was again heated for a minute, the precipitate allowed to settle and collected on one side of the beaker. The supernatant liquid was then drawn off through an asbestos mat filter stick and the precipitate sucked as dry as possible. It was washed 5-6 times with 0.5-1 cc. of hot water. The beaker, with the precipitate and the filter-stick, was heated by placing it for 1-2 minutes on the boiling water-bath to remove all adhering water, then dried for 10 minutes in a current of air at 125° in a Benedetti-Pichler drying apparatus. The beaker, precipitate and filter stick were weighed in a microbalance after wiping with moist flannel and dry chamois according to prescribed methods. A table of results obtained by both the macro and micro methods is given.—P. R. RAY and M. K. BOSE *Mikrochem.*, 17 (1935), 11 (L. L. M.)

Ricinolein—Solubility of Distribution Coefficient, between Neutral Glycides and Water, of Substances Soluble in All Proportions in Two Solvents The distribution coefficients of methyl alcohol, ethyl alcohol and acetic acid were determined for the system ricinolein and water and the average value for each found to be 0.23 at 20° .—A. LINDENBERG *Compt. rend. soc. biol.*, 118 (1935), 444, through *Squibb Abstract Bull.* 8 (1935), A-459 and A-477

Sodium Cholate Preparations—Quantitative Determination of The method is based upon the fact that the bile acids yield cholic acid upon hydrolysis. The bile salts are separated from accompanying mucin and other proteins by extracting the bile salts with hot alcohol filtering and evaporating the solvent. The bile salts (0.25 Gm.) are heated with 10 cc. of a 10% sodium hydroxide solution for two hours on a water-bath, then cooled, 30 cc. of water added, and 5 cc. of a 5% $BaCl_2$ solution to precipitate the fatty acids. The excess barium in the filtrate is precipitated with sodium sulphate, the solution warmed to enlarge the crystals of the fine precipitate and filtered through a thick filter. The filtrate acidified with sulphuric acid, is extracted with a peroxide free ether. The residue remaining after evaporation of the ethereal solution is dissolved in a few cc. of neutral alcohol and titrated with 0.1N alkali, using phenolphthalein as an indicator. The method can be used for any of the bile products or preparations.—G. VASTAGH *Pharm. Zentralh.*, 76 (1935), 189 (E. V. S.)

Spectroscopic Analysis A fifty page review with bibliography.—F. PAVELKA and H. MOLTERER *Mikrochem.*, 17 (1935), 47 (L. L. M.)

Spot Reactions—VIII Application of, to Detection of Organic Compounds Tests described for dicarboxylic acids are based upon their conversion to dyes of the fluorescein series by means of concentrated sulphuric acid and resorcinol, tests for keto acids, upon conversion to fluorescent umbelliferone derivatives by means of the same reagents. Color and fluorescence are tabulated for the following compounds: oxalic, malonic, succinic, tartaric, tricarballic, malic and citric acids, succinic anhydride, succinimide, normal potassium succinate, asparagine, trimellitic

acid trimethyl ester, naphthoic acid anhydride, saccharin and acetoacetic ester Full details of the micro-technique are given —F F V ANGER and O FREHDEN *Mikrochem*, 17 (1935) 29 (L L M)

Strophanthin g- and k- —Identification of, by Microchemical Test The identification of g and k-strophanthin is difficult The method is based on the micro determination of the melting point of the hydrazone or osazone of the monosaccharide split out on hydrolysis About 10 to 20 mg of strophanthin are treated in a narrow tube with 0.4 to 0.5 cc of 2% alcoholic hydrochloric acid The tube is sealed and heated for 10 hours on a water-bath The entire liquid is then transferred to a micro beaker and the alcohol carefully evaporated, the residue dissolved in 1 cc of water neutralized with sodium carbonate and then weakly acidified with 1 drop of acetic acid About 20 mg of medicinal charcoal is then added and the material allowed to stand for 5 minutes with stirring The charcoal is removed by filtration and the colorless filtrate evaporated in a micro beaker on a water-bath until only about 1 drop of liquid remains One to 2 drops of a freshly prepared solution containing 1 Gm phenylhydrazine hydrochloride and 1.5 Gm sodium acetate in 10 cc water is then added The walls of the beaker are rinsed with the liquid so as to bring all of the sugar into solution, the liquid then drawn up into a capillary tube sealed and heated on a water bath for 1 hour In order to obtain good crystals the tube is allowed to cool slowly in the water bath Examine the crystals under a microscope If they look impure or poorly formed, recrystallize them The tube is then opened at one end the crystals loosened by means of a glass thread, centrifuged and the supernatant liquid drawn off Some 30% alcohol is introduced, the tube sealed and heated in a bath until the crystals dissolve The solution is again allowed to cool slowly when well-defined crystals are obtained The crystals are blown onto a slide and then carefully washed between the slide and coverslip with 30% alcohol and then with water After drying in a warm current of air the micro melting point is determined Sufficient material is obtained for several melting point determinations In the case of g strophanthin, a melting point of 182–184° is observed which corresponds to rhamnosephenylosazone With k strophanthin, a melting point of 224° is obtained which corresponds to that of glucosazone —R FISCHER and W PAULUS *Scientia Pharm* 6 (1935) 32 (M F W D)

Tonicum—Determination of Arsenic in The author criticizes the method of van Giffen on the grounds of incomplete destruction of the organic matter affecting the bromine titration and the inaccuracy of the indicator used in the determination of arsenic in Tonicum He offers the following alternative method 5 cc of the 'Tonicum' is digested as suggested by van Giffen the heating being continued until the liquid remains clear for five minutes After cooling, 20 cc of water, 2 cc of N/10 permanganate and a small piece of pumice are added and the mixture boiled exactly five minutes over a low flame The excess permanganate is removed with a few drops of oxalic acid One cc of N potassium iodide and 12 cc of 25% hydrochloric acid are added to the cooled liquid After exactly 5 minutes it is titrated with N/100 sodium thiosulphate, 2 cc of starch solution being added near the end of the titration The last drops are added at one minute intervals with constant agitation A blank titration is subtracted from the result One cc of N/100 thiosulphate = 1.46 mg sodium methylarsenate (—7 mols of water of crystallization) The author claims results of less than 1% —J N VAN'T SPIJKER *Pharm Weekblad*, 72 (1937) 295 (E H W)

Tonicum N M P—Analysis of Tonicum N M P consists of a 125-cc package containing a liquid of the following composition Liquid extract of cola 200 cc, simple syrup 300 cc glycerin 340 cc, aromatic spirit 29 cc tincture cardamon 1 cc alcohol 45 cc, sodium methylarsenate 1 Gm tincture nux vomica 10 cc, saccharated manganese 2 Gm, sodium bisphosphate 37 Gm water to make 1000 cc Sugar is determined by inverting 20 cc of the liquid with 12 cc of strong HCl in 68 cc of water by heating 10 minutes at 68–70° This is then cooled to 15–20°, transferred to a 500-cc flask together with 28 cc of 4N alkali and filled to the mark with water 5 cc of this is boiled with Fehling's solution and titrated by the method of Lehmann-Schoorl The alcohol is determined by distilling 50 cc of the liquid diluted with 50 cc of water until the distillate measures exactly 50 cc the alcoholic content being determined by the specific gravity of the distillate Caffeine is determined by treating the distillation residue from the alcohol determination with 4 cc of 4N alkali in a separatory funnel, 50 cc of chloroform are added and the whole shaken for ten minutes This is followed by three successive shakings with 25 cc of chloroform the united chloroformic extracts being dried and weighed Glycerin is determined

by warming the aqueous liquid from the caffeine determination until the chloroform is removed, neutralizing with HCl and determining the glycerin by the method of *Ph Weekblad*, 71 (1934), 692. Phosphate is determined by taking up the ash from a sample in acidulated water, precipitating with magnesia mixture and finally igniting and weighing as magnesium pyrophosphate. Arsenic is determined by digesting 5 cc of the tonic, 5 cc of 30% hydrogen peroxide and 3 cc of H_2SO_4 in a Kjeldahl flask, adding 35 mg of hydrazine sulphate, boiling 10 minutes, adding 35 mg of KBr, cooling, adding 1 cc CCl_4 and two drops of saturated aqueous iodine solution and titrating with *N*/100 potassium bromate. 1 cc of *N*/100 potassium bromate is equivalent to 1.37–1.46 mg of methyl disodium arsenate, depending upon water of crystallization. Several tests for identity and purity are also given. Analysis of *Tonicum*, Roche is made in similar manner.—H J VAN GRIFFEN *Pharm Weekblad*, 72 (1935), 191 (E H W)

Tragacanth—Testing of Rubrics of the Swedish Pharmacopœia, X, concerning tragacanth are reviewed. Statements regarding neutral reaction of the mucilage are incorrect. In his experience, Karsmark has never seen a neutral tragacanth mucilage. The requirement that a blue coloration shall be produced with *N*/10 iodine is seldom fulfilled by the best quality of tragacanth. Correct viscosity is more likely to go with failure to give the iodine color reaction (i.e., absence of starch gains). There is a relation of drug quality and viscosity of the mucilage, the higher the better. Also there is a parallel relationship between opalescence of the mucilage and viscosity.—K A KARSMARK *Farm Revy*, 34 (1935), 161, 169 (C S L)

Tung Oil—Iodine Value of As a result of research on the quantitative relations of time, excess of Wijs reagent, and temperature to the iodine value of tung oil it was found that even after 12 days of contact the iodine value tends to increase. It is proportional to the excess of iodine in centigrams of equivalent iodine per Gm of oil, instead of being proportional to the percentage excess of Wijs solution, as usually stated. If the ratio of Wijs solution added and weight of sample of oil is kept constant almost identical iodine values are obtained when temperature and time are the same. When time of contact and excess of iodine are constant, the iodine value increases with increase in temperature. With the same excess of Wijs solution, almost identical iodine values can be obtained at different temperatures by varying time of contact. Standard conditions for converting iodine value are proposed.—K HO, C S WAN and S H WEN *Ind Eng Chem, Anal Ed*, 7 (1935), 96 (E G V)

Tyrosine—Separation of, from Cystine A method for the separation of large amounts of tyrosine from cystine has been worked out which permits recovery of 92 to 94% cystine but which fails if very small amounts of cystine are mixed with very large amounts of tyrosine. The point of isolation of a mixture of cystine and large amounts of tyrosine is at a pH of 1.72 to 2.0.—F R GREENBAUM *Am J Pharm*, 107 (1935), 162 (R R F)

Umbelliferone—Content of, in Persian Gum Ammoniac The Persian gum (*Dorema ammoniacum*) was shown to contain umbelliferone by the fluorescence developed upon alkalinizing a hydrochloric acid alcohol extract of the gum. The fluorescence may be seen in ordinary light, but is intensified in ultraviolet light. These positive findings disprove the literature statements that umbelliferone is not present in this variety.—K SZÄHLENDER *Arch Pharm*, 273 (1935), 234 (L L M)

Vegetable Oils—Absorption of Ultraviolet Light as Function of Commercial Treatment Using Chevallier and Dubouloz spectrophotometric method (*Bull Soc Chim Biol*, 14 (1932), 1076–1087) on 1% solutions of olive oil in hexane it was found that virgin or 'extra' olive oils have an absorption coefficient ($\log I/I_0$, in which I and I_0 are the intensities for the solution and the solvent, respectively) at 2700 Å of less than 0.200, higher values indicate either a refined oil or a mixture of refined and virgin oils.—J GUILLOT *Ann Fals*, 28 (1935), 69–75 (A P-C)

Vitamin A—Determination of, in Oils by the Spectrophotometric Method While all authors are in accord regarding the selective absorption of vitamin A at 3280 Å, they do not agree as to the method of utilizing this property for the assay of vitamin A in oils. In previous papers Chevallier, *et al* have shown the parallelism that exists between the value of absorption and the biological activity of a product. In the present paper they again show that when working with oils with an absorption maximum at 3280 Å the physical measure corresponds to the biological titer. For highly active fish liver oils in 1% hexane solution in 1-cm cell, an intensity of absorption of 3280 Å = 1 for $\log 1/0.1$ was equivalent to 730–750 U S P vitamin A units. For an ordinary common cod liver oil manufactured and preserved under the best conditions, the inten-

sity of absorption of $3280 \text{ \AA} = 2.7$ for $\log 1^\circ/1$ (1% solution) was equivalent to 2025 U S P units of vitamin A. Examination of a large number of common cod liver oils showed a vitamin A activity varying from 150 to 3000 units. Badly prepared or preserved oils show an absorption spectrum displaced toward the shorter wave-lengths due to the decomposition products of vitamin A. In this case it is not possible to utilize the spectrophotometric method. Several advantages of this method are discussed.—A. CHEVALLIER and P. CHABRE. *Bull. soc. chim. biol.*, 16 (1934), 1451, through *Squibb Abstract Bull.*, 8 (1935), A-485.

Vitamin A—Differential Reactions between Carotene and Oils Rich in Antimony trichloride, trichloroacetic acid and chloral hydrate each yield with carotene and with halibut liver oil a characteristic blue color. The blue color persists when the reaction mixture containing carotene is heated to 100° , whereas the halibut liver oil mixture changes to purple. Cod liver oil and butter fat yield with trichloroacetic acid and chloral hydrate immediately a purple without heating. A reagent containing sulphuric acid and formaldehyde forms with carotene a purple zone, with halibut liver oil a bright red color is developed in the acid layer and a blue to purple in the chloroform layer. The reagents may also be used to differentiate carotene and vitamin A from ergosterol and cholesterol.—VICTOR E. LEVINE and GEORGE E. BIEN. *Proc. Soc. Exptl. Biol. Med.* 32 (1935), 873. (A. E. M.)

Vitamin A—Differentiation of, from Carotene by Means of Antimony Trichloride Vitamin A and carotene develop a blue color when treated with antimony trichloride in chloroform solution. The color produced by carotene persists after heating to 60° whereas that caused by vitamin A changes into red or violet-red. Pyrocatechin which was used by some authors for differentiation, is not only needless, but actually inhibits the development of the blue color.—A. C. ANDERSEN and V. E. LEVINE. *Proc. Soc. Exptl. Biol. Med.* 32 (1935), 737. (A. E. M.)

White Mineral Oil and Petrolatum—Use of, in Pharmaceutical and Cosmetic Practice There is very little in the literature about chemical and physical characteristics of these products. Many topics are considered in the present paper. Theory of the origin of crude oil, its occurrence in Asia, Europe and North America, the classification into three general types according to chemical structure—naphthene base crude, paraffin base crude and mixed base crude—and where they are found. The present process for white oil refining was invented by J. Markovnikov, a Russian chemist, about 1887, and in 1895 another Russian, Grigori Tetroff perfected it so that it was commercially useful. The principle of refining processes involves removal of the light fractions and then fractionating the residue, the main object being removal of unsaturated hydrocarbons. These hydrocarbons are unstable, give unrefined oil its odor and taste. The oil is treated with sulphuric acid, washed with alkalis and filtered. Removal of unsaturated hydrocarbons or other impurities is necessary if oil is to be used internally or even for cosmetics, because of possible skin irritation. The U S P test for unsaturates is done with sulphuric acid and is satisfactory except for the vague specification of 'pale amber.' U S P XI has adopted a definite color standard. The U S P has definite specifications for viscosity and for internal use the viscosity should be high since it is believed that property lowers tendency to leakage. Cloud point is important because it indicates absence of solid paraffins but opalescence might be due to moisture. Moisture is readily absorbed. The British Pharmacopoeia directs that the oil be dried by heating to 110°C and cooling in a desiccator before determining cloud point. Specific gravity has significance. Action on intestinal tract is not simple lubrication but the oil emulsifies with intestinal contents so the higher the specific gravity, the more readily it will emulsify. The U S P lead oxide test for sulphur or sulphur compounds no doubt gives negative results with all oils offered for medicinal purposes. Sources of crudes for white mineral oils are discussed. Uses of the refined oils are emulsions with various gums, nasal sprays, baby oils, ointments and creams. Essential requirements for cosmetic white oils are correct viscosity and preference is for those of naphthene base type. Oils of low viscosity are generally employed for liquid brilliants along with a mineral oil which is volatile like a completely refined kerosene. Mineral oils are used in the so-called sun tan oils in vanishing creams to prevent drying out, as softening agents in brushless shaving creams and other softening preparations. Petrolatum is closely related to mineral oil and to paraffin but with important differences. Petrolatum may be considered a colloidal system in which the solid wax is the external phase and the oil the internal phase. The liquid would separate from the solid but for the presence of a gel former called proto-substance. Proto-substance is present in satisfactory quantities in natural petrolatum but is often removed in refining.

Petrolatum is obtained only from paraffin base and mixed base crudes. Purification by "adsorption," contact with porous material like bone black, etc., is slow and tedious. More rapid methods with strong chemicals sacrifice quality for very light color. Petrolatum used for pharmaceutical and cosmetic preparations should be of medium fibre. Long fibre makes sticky or stringy product, short fibres give too thin a body. Melting point need only be high enough to preclude liquefying of the product in summer. Consistency is important and can be determined by an instrument similar to the asphalt penetrometer. U S P petrolatum can be classified into three distinct types: (1) medium melting point and medium consistency, (2) low melting point and soft consistency, (3) high melting point and medium consistency. Those of type No 1 are the standard ones of commerce, suited for pharmaceutical and cosmetic purposes. Type No 2 is recommended for resale as petroleum jelly for household use. Type No 3 is used only where addition of liquids would reduce melting point too much. A fourth type which has high melting point and hard consistency is useful in lip and paste rouges. Selection of correct type of petrolatum should depend upon the purpose. The U S P is recognizing progress in refining of petrolatum by proposed changes in official ointment formulas.—ERICH MEYER *J Am Pharm Assoc*, 24 (1935), 319 (Z M C)

TOXICOLOGICAL CHEMISTRY

Apiol—Detection and Determination of, in Viscera Treat a suitable sample of viscera by the Stas Otto method for poisons, apiol, if present, may be contained in the petroleic ether or in the acid ether extract. Partially evaporate the solvent, add sufficient decinormal silver nitrate (10 cc) to precipitate any oxalates that may be present. Let stand 10 minutes, filter, precipitate the excess silver with concentrated hydrochloric acid (avoiding an excess), filter into a round bottom evaporating dish, evaporate slowly on the water bath, add two 2 cc portions of 1 + 1 nitric acid, evaporate 3 times (with intermediate addition of a few cc of water), dissolve the residue in 10 cc of hot water, filter, wash, neutralize with 3 drops of ammonia water, add 1 cc acetic acid, heat, add calcium chloride solution to complete precipitation, let stand 3 hours on the water-bath, filter, wash, dissolve the precipitate in 5 cc of boiling 1 + 9 hydrochloric acid, add 5 cc of 1 + 4 sulphuric acid and titrate hot with decinormal potassium permanganate. The equivalence between the permanganate and apiol should be determined experimentally, as the oxidation with nitric acid does not give 1 molecule of oxalic acid per molecule of apiol.—I PAYEN *Ann Méd Légale Criminel Police Sci*, 15 (1935), 59–61 (A P-C)

Lead Poisoning—Detection of With the introduction of the Feigl "Tupfelreaktion" reagents, the micro detection and in many instances the quantitative estimation of many elements has been made possible. One of the best known and most useful of the spot-test procedures is the dithizone method for detecting lead. This has been applied to biological material by J R Ross and C C Lucas (*Canad Med Assoc J*, 29 (1933), 649) and W Lineweh (*Deut Arch klin Med*, 175 (1933), 157). Their method takes advantage of the fact that a cherry red color is produced in the lower layer when a lead containing fluid is shaken with a carbon tetrachloride or chloroform solution of dithizone. By the use of this dye (diphenyl-thiocarbazone) as little as 0.1 γ of lead can be detected. Such sensitivity brings the chemical method into the range claimed for the spectrograph, and it is so much easier to apply that it is likely to gain, and for the present to retain, the favor of biochemists concerned with lead estimations.—Lancet, 228 (1935), 501 (W H H)

Organic Solvents—Modern A brief discussion of the difficulties inherent to the identification of organic solvents from the standpoint of toxicology and medico legal work.—H ZANGGER *Ann Méd Légale Criminel Police Sci*, 15 (1935), 13–20 (A P-C)

Trichloroethylene—Intoxication by A detailed description of a fatal case of intoxication by trichloroethylene of a workman who had painted a tank with a paint consisting of asphalt dissolved in trichloroethylene. A 20 Gm portion of the tissues of the corpse was distilled with 60 cc of alcohol and 5 cc of 5% alcoholic solution of tartaric acid, and the distillate was refluxed for 1 hour with a 10% alcoholic caustic potash solution free from chlorides, the solution gave a decidedly positive test for chlorides, but no quantitative determination was made.—C VALLEE and J LECLERCQ *Ann Méd Légale Criminel Police Sci*, 15 (1935), 10–12 (A P-C)

PHARMACOGNOSY

VEGETABLE DRUGS

Drugs and Bugs In general, drugs with abundance of starch, inulin and sugars are most liable to attack of pests. Some knowledge of harmful insects, their life cycle and habits and some of the means of preventing and combating their ravages is essential. Adult insects have well developed mouth parts and can be classified into two groups: mouth parts fitted for chewing, mouth parts fitted for sucking. Pharmacists are chiefly interested in the biting ones though the sucking ones cannot be entirely ignored because some young biting ones later develop into sucking insects. The drug store beetle and the square-necked grain beetle are described and drugs which they infest are listed. Control is by fumigating or by heating to 49° C. Carbon disulphide is recommended. The author makes suggestions for detecting them, evidences of and classification of, preventive measures including sanitation, temperature and moisture means of extermination, heat for eggs, larvae and insects and fumigation with carbon tetrachloride or chloroform. Ideal pest exterminators must arrest growth or destroy parasite, be more toxic to pest than host, be adherent and maintain active properties for a period of time, enter into intimate contact with parasites or their elements. To prevent vegetable or mold parasites drugs should be kept in dry state. The list of drugs given may be kept satisfactorily by the so called "vacuum method". New supplies are placed in a vacuum chamber for several hours then transferred to air tight containers.—ERNST T. STUHR *J. Am. Pharm. Assoc.*, 24 (1935), 285 (Z. M. C.)

Leonurus Cardiaca The herb, whole and powdered, is described botanically, macro and microscopically. Chemically analysis shows volatile matter at 100° C. 6.92%, total ash 13.64%, petroleum ether extractive, 1.82%, ether extractive, 4.88%, alcohol extractive, 21%, water extractive, 29.90%, volatile oil 0.05%, and crude fibre, 15.11%. A 2% aqueous acid extract is precipitated by lead acetate; the filtrate is precipitated by basic lead acetate, weakly reduces Fehling's solution, and gives precipitates with the usual alkaloidal reagents. Microsublimation yields a product which reacts slightly with Mayer's or silicotungstic acid reagents. The percentage of alkaloid present (0.05%) is determined by the usual method of extraction using an ammoniacal ether mixture as the initial solvent. The tannin content is tabulated and is determined in the samples by the hide powder method of precipitation and by the method of Schultze. Therapeutically, various workers state its use as a tea for prostate sufferers, climacteric complaints as an expectorant, astringent, sedative and for its heart action. Pharmacologically, no such actions were obtained on either the dog, rat, mouse or frog. The astringent action is due to the tannin present. The direct color and the color under the fluorescence lamp of extracts prepared using various solvents is tabulated.—W. PEYER and H. VOLLMER *Pharm. Zentralh.*, 76 (1935), 97 (E. V. S.)

PHARMACY

GALENICAL

Cocoa Butter—Use of, as Excipient in Pills Containing Extracts Pills containing vegetable extracts can be made as well with cocoa butter alone as with a mixture of this with chocolate. Preparation is described of pills of *Sagralin* (*Pillulae Frangulae Compositae* Ph. Dan., 1933) and of valerian pills under various conditions of mixing and with cocoa butter only. Use of both licorice root powder and yeast powder as excipients is recommended. The disintegration rates of the two sorts of pills are studied by a method of determination of disintegration time which is described. The errors of dosage of hand made pills are considered. If the pills were carefully made these errors were found to be under 2% and due chiefly to the weight variations of the pills. The mean deviation from the mean weight of 1800 pills weighed singly to an accuracy of 1 mg. was 2.36%. The pills were also weighed in groups of 100 and the mean percentage deviation from the mean weight so obtained was found to agree well with that observed for the entire group of 1800.—A. T. DALSGAARD *Dansk Tids. Farm.* 9 (1935) 73-97 (C. S. I.)

Homogenizer—Hand Type, and Its Use in Making Emulsions A small inexpensive instrument has lately appeared on the market and it has been found very convenient and efficient for manufacturing pharmaceutical emulsions on a small scale. The author's conclusions are: (1) The efficiency, versatility and ease of operation of this apparatus are outstanding. (2) It pro-

vides a saving of materials both in the elimination of waste through cracked emulsions and the reduction in the necessary amount of emulsifying agent (3) An emulsion prepared by its use possesses a high degree of dispersion and a much slower rate of creaming than emulsions prepared by the usual trituration methods—LINWOOD F TICE *Am J Pharm*, 107 (1935), 158

(R R F)

Tolu Coating, U S P X and N F V—Value of A study was made of tolu coated pills to determine percentage of disintegration in the body Pills containing methylene blue and barium sulphate were made The barium sulphate was used so that the X-ray could be used to locate the position of the pills in the digestive tract and the methylene blue by its property of coloring the urine made possible the determination of disintegration where X ray was not used and in determining entirety of coat Coated pills were placed in water to see if the coating was perfect, leakage of methylene blue showing any opening Microscopic examination indicated that the coating was about 0.1 mm thick, no thicker than necessary to protect the pill Tiny depressions did not take as heavy a coat as smoother surfaces The authors believe that if the coating were absolutely uniform the pills would be as impervious to water or digestive fluids as lead shot Old tolu was better than fresher because it had lost most of its volatile oil and there was greater disintegration of pills coated with it Four different samples were used and all coatings were tested in two ways Color of urine was observed for sixty hours When the X-ray was used, the subject was given six pills Radiographs were taken at intervals, a small teaspoonful of Bari o-meal being given before the first Each series of tests is reported in considerable detail, number of subjects, disintegration time, etc Altogether 286 pills were given 112 subjects were used, 102 pills disintegrated The percentage of disintegration was 35.66 most of it taking place in the colon, probably too late for proper absorption It is recommended that gelatin coating be substituted for tolu coating in the forthcoming revisions of the Pharmacopœia—F S BUKEY and MARJORIE BREW *J Am Pharm Assoc*, 24 (1935), 291

(Z M C)

PHARMACOPŒIAS AND FORMULARIES

British Pharmacopœia—Revision Notes on The article consists of a critical review of the following products of the British Pharmacopœia Acidum Hydrocyanicum Dilutum, Amylum, Carboni Dioxidum, Eucalyptol, Liquor Ammoniae Fortis, Liquor Hydrogenii Peroxid, Liquor Plumbi Subacetatis Fortis, Oleum Eucalypti, Glycyrrhiza, Quassia, and Prunus Serotina—J HENDRY and P A BERRY *Australasian J Pharm* 16 (1935), 37

(T G W)

Swiss Pharmacopœia—Practical Questions on It was decided at the convention at Baden to publish the work of the Zürcher Commission on Pharmacopœial Questions in the *Schweiz Apoth Ztg* Information is given about 57 articles official in the Swiss Phar stating, in some cases, changes which will be made in the new edition of the same There follows a description of specialties, endorsed by the Schweiz Apoth-Verein which have been taken into the new pharmacopœia Because of the numerous changes in the new pharmacopœia, the commission recommends that all formulæ and prescriptions specify whether the ingredients should be those of the 4th or the 5th edition Reference is made to a table in the new edition which shows the differences in the preparations The Pharm Helv V becomes official May 1, 1936—*Schweiz Apoth Ztg*, 73 (1935), 165

(M F W D)

NON OFFICIAL FORMULÆ

Manicure Preparations—Modern The article consists of a number of formulas for manicure preparations which could be made by the pharmacist The formulas listed consist of cuticle removers, nail bleaches nail polishes, nail white and cuticle cream—*Chem and Drug*, 122 (1935), 357

(T G W)

Nail Polishes and Enamels The preparation of nail polishes is carried out in the sifting and mixing machines The different ingredients are weighed out in their respective proportions and simply thoroughly mixed and sifted Ordinary putty powder, or oxide of tin is the principal constituent To this are added the usual powder materials—chalks, pumice powder kaolin osmo kaolin and zinc oxide The tinting of the mass is done by adding a small proportion of selected dye Eosine Bengal red and various organic dye materials are used The coloring matter is added to one constituent, and the latter is then incorporated with the others When liquid polishes are used purely chemical preparations have been substituted The more cus

tomary practice is to suspend the ordinary polishing powder in selected gums and glycerine. The suspension must be perfect, and permit of the liquid being filtered so that the product for the market is represented by a comparatively clear solution. Tragacanth, starch and similar agents are used. **Nail Enamels**—A well-made enamel confers a bright, lustrous and yet natural appearance. Solvents and plasticizers represent the principal components. Nitro cellulose is used to produce the best enamels. The enamels at present on the market are chiefly those of nitro cellulose celluloid, and benzoin. The preparation used by photographers which consists of celluloid obtained from scrap sources and dissolved in amyl acetate is widely employed. It consists of cutting up the scrap and charging into a comparatively large mixing pan. Amyl acetate and acetone are poured into the pan, and heat gently applied. The consistency of the product can be varied by the amount of scrap added and it should be reduced to a syrupy condition. Some selected perfume is then added in the usual manner, and the charge emptied. Larger manufacturing perfumers employ ester gum and other addition agents to improve the lustre. Selected benzoates, glycols, ovalates, tartrates and camphor are used as plasticizers. The plasticizer used should, where possible, possess a comparatively high boiling point whereby the solvents of the cellulose are thus given the opportunity to evaporate, and leave the enamel in the desired condition. The plant used for systematic production consists of a small specially constructed boiler, in which the ingredients are added. Air is excluded, and the temperature raised by steam heat with the greatest accuracy. When all material has passed into solution the odor of the product is noted. Some of the organic solvents such as the acetones and acetates possess a strong odor, and it would take much perfume to overcome it. Methods such as those employed by deodorizers of oils consist of passing air or even coal gas through the mass, but criticism arose over the possibility of unexpected and uncontrolled reactions occurring. For this reason the work was modified to simply mixing the solvent and plasticizer raising to the desired temperature cooling and adding the selected perfume. It is a good plan to allow the preparation to rest for some time in the air tight vessel before adding the perfume. The final additions are the perfume and the dye.—A. G. AR
END *Perf and Ess Oil Rec* 26 (1935) 122 (A C DrD)

Violet Perfumes—A discussion of violet perfumes dealing with the cultivation of the flower, odor, violet leaf, the use of ionone, blenders, aging and soap perfumery is given.—H. SIL
MAN *Perf and Ess Oil Rec*, 26 (1935), 119 (A C DrD)

Cherry Gum—Emulsifying and Coating Properties of—The author states that cherry gum is slightly soluble in water, most of it swells in water without going into solution. Because of this property of cherry gum, a proper emulsion cannot be obtained. Under these circumstances cherry gum cannot be used as a suitable substitute for gum arabic in the preparation of emulsions.—N. P. KALASCHNIKOW *Sowjet Pharmaz*, 5 Nr 4 (1934), 35–35. *Pharmakol Abt Leningrad wiss prakt Pharmaz inst*, through *Chem Zentr* 106 (1935), 925 (G B)

Galenic Preparations—Investigation on III Fowler's Solution—This preparation has undergone numerous changes in formula and preparation since its introduction in 1786. The Swiss Phar V directs a solution to be made of 1 part arsenous acid and 1 part potassium bicarbonate in 2 parts water, then dilute with 50 parts water and neutralize to litmus paper by the addition of about 9.5 cc. N hydrochloric acid, after which the preparation is completed. This amount of hydrochloric acid is just equivalent to the potassium bicarbonate. Since arsenous acid does not redden blue litmus, it plays no role in the neutralization. It may be concluded that the preparation so made contains no potassium arsenite and is a solution of arsenous acid and potassium chloride. Considering this fact the title of the preparation is false. If instead of 1.0 Gm arsenous acid 1.476 Gm potassium metaarsenite (KAsO_3) is used and the solution neutralized to litmus with hydrochloric acid the resulting solution is exactly identical with that of the Swiss Phar and is most rapidly and easily prepared. A correct title for the preparation would be 'Sol Acidi arsenicosi cum Kalio chlorato'.—L. ROSENTHALER *Scientia Pharm*, 6 (1935) 41 (M F W D)

Glycerinum Thymolis Rubrum, A. P. F.—Notes on Coloring of—The coloring material used in this preparation have not been satisfactory. The preparation formerly contained 20 minims each of Solution of Carmine and Tincture of Cudbear, and in 1934, 40 minims of each were directed in order to delay a noticeable fading of the color. The author attempted to determine which of the two coloring agents was at fault and to find an alternative coloring matter which would prove more permanent. Solution of Carmine was found to be more stable than the Tinc

ture of Cudbear, and is moderately satisfactory if the preparation is stored in a dark place. Amaranth 184, in the form of Liquor Ruber, A P F, 80 minims in 20 fluidounces, forms a satisfactory coloring agent and can be stored under ordinary light conditions without decomposition.—
 E E NYE *Australasian J Pharm*, 16 (1935), 41 (T G W)

PHARMACEUTICAL HISTORY

Revolutionary Account Book of Christopher, Jr, and Charles Marshall The Marshall Drug Store, a prominent colonial pharmacy, was founded in 1729 by Christopher Marshall, Sr, a "fighting Quaker." The sons succeeded to the business and Charles, apothecary, botanist and chemist, attained a fine reputation for integrity and skill. In his old age he became the first president of the Philadelphia College of Pharmacy. In the archives of the College is the book described in the article. It is a typical "Day Book" of 32 leaves. The upper part of the cover is shown and several facsimile pages. Entries show miscellaneous character of the business. Though major business was in drugs and medicines there was extensive trade in paints, oils and glass. Prices are in pounds, shillings, pence. Spelling is poor. Dr Abraham Chovet's name appears frequently as does Dr John Morgan's. Christopher Sower, a Germantown printer who published the first Bible in America was a customer. Some interesting items are discussed as well as prices of substances that are still in use.—CHARLES H. LA WALL and MILLICENT R. LA WALL *J Am Pharm Assoc*, 24 (1935), 302 (Z M C)

PHARMACEUTICAL EDUCATION

Botany Course—Value of, as a Foundation for the Pharmacognosy of Stem and Bark Drugs It is necessary to distinguish between aerial stems and underground stems. The following features need emphasis: Location of growing point, manner of branching, origin of branches, buds and leaf scars, functions of each, internal or microscopic structure of each. The outstanding characteristics of the four types of underground stems: rhizomes, corms, bulbs and tubers should be pointed out. Leaf scars and bud scales on upper surface of rhizomes should be pointed out. For bulbs, onion or garlic or squill may be used. Outer papery membrane, fleshy scale enclosing buds and roots should be emphasized. The corm does not consist of thick fleshy scales but is solid and more flattened from top to bottom. The Irish potato is an excellent example of a tuber. Buds should be examined, as well as outer corky layer and rows of vascular bundles internally. Microscopic structure is more important than gross anatomy. A knowledge of tissues present in entire stem enables the student to understand functions. Structure, too, can be used to distinguish between types of stems, monocot, dicot and fern. Comparisons should be thorough in order that the student will comprehend meaning of all the terms encountered in the official description of the structure of drugs derived from the stem of a plant. Types of vascular bundles need detailed study. The change in vascular bundles taking place in stems which undergo secondary growth can be shown with *Menispermum Canadense*, *Cascara Sagrada* in transverse section. It is excellent for detailed study of a bark.—C C ALBERS *J Am Pharm Assoc* 24 (1935), 310 (Z M C)

Chemistry—How Should Fundamental Courses in, Be Taught in a College of Pharmacy How these courses are presented and the training of the individuals who present them are of paramount importance. Important applications of organic chemistry should be stressed somewhere in the pharmacy course but the three hours a week of classroom work devoted to organic chemistry is hardly enough for adequate foundation for specialized courses. Practical application would diversify but would result in weakness rather than strength. Interrelationships must be established in order to coordinate organic and inorganic courses. If principles of hydrolysis are taught, they only need to be reviewed when studying solution of aluminum subacetate of the National Formulary. Also in the preparation of syrup of calcium iodide, iron is oxidized to its higher valence before precipitation with calcium carbonate because study of solubility products of ferrous carbonate and ferric hydroxide show that the syrup will contain less iron if removed after oxidation. Evolution of carbon dioxide may be pointed to as evidence of hydrolysis of ferric carbonate and a reason why the precipitation takes place as rapidly and completely as it does in spite of the little difference in solubility products of calcium carbonate and ferric hydroxide. There is fundamental chemistry in the preparation of this syrup but it is not essential that it be mentioned when hydrolysis, oxidation and solubility products are discussed in general chemistry. It seems more

essential that teachers of professional and technical courses have a profound knowledge of fundamentals upon which their specialties rest than that teachers of fundamental subjects have in mind all the important and useful applications of their subject. Good teaching requires that a course be interesting so *judicious* use of applications is permissible but this does not change the general principle —ERNEST LITTLE *J Am Pharm Assoc*, 24 (1935) 307 (Z M C)

Homeopathic Pharmacy—Basic Demands of The author stresses the need of physiological and pharmacological studies and assays for homeopathic medicines —H NEUGEBAUER *Pharm Zentralh*, 76 (1935), 192 (E V S)

Homeopathy Homeopathic practice seems to be rather widely developed in Germany. In the *Süddeutsch Apoth-Ztg* (Feb 22, 1935) is the report that 400 pharmacists of southern Germany took a course in homeopathy given by E Bamann. The general outline of the course and its divisions such as "Development of Homeopathy," "Technique of Preparing Dilutions," etc., are described and briefly commented upon —E K *Schweiz Apoth Ztg*, 73 (1935), 172 (M F W D)

Teachers and State Board Examiners—Problems of the Scope of practical pharmacy and dispensing has become more complicated because of the limited amount of practical drug store experience that candidates for registration have and because of the large number of new preparations put on the market for all to learn about. It is necessary for teachers to supply training that once was obtained in drug stores. Teaching processes and procedures of the U S P and N F is not a burden but with hundreds of others and combinations of them added it seems possible to teach no more than basic principles underlying the art of compounding and dispensing. Examiners are confronted with difficult problems like the number and type of prescriptions to be given to an applicant, the number of times an applicant may fill a prescription and how it should be graded. If examiners and teachers were to cooperate, plans might be made for more uniform examinations. Since comprehensive examinations are best the larger the number of preparations the better. It is suggested that 60% consist of U S P and N F preparations with directions given and the remaining 40% prescriptions without directions. Reading original prescriptions is seldom considered but it might be made a part of the test to determine whether the candidate can handle the prescription from the time he receives it until it is turned over to the customer —HARRY W MANTZ *J Am Pharm Assoc*, 24 (1935), 296 (7 M C)

MISCELLANEOUS

Homeopathic Pharmacy in 1934 A review of the work accomplished in homeopathic pharmacy in 1934 —H NEUGEBAUER *Pharm Zentralh*, 76 (1935), 212 (E V S)

Profit—The Way Out of the Depression To protect the public, prices must be at a level that allows adequate pharmaceutical service. A code of fair competition must be a guide for ninety per cent of the stores. Laws of the States demand that highly skilled persons sell drugs and if there is only one employee that one must be a registered pharmacist. In small retail stores minimum code wage is not apt to be maximum drug store wage. All fair trade provisions will control selling power of all items controlled by the code. The public must pay the cost of handling all items. This fundamental importance is shown by specific figures. If recovery is to come to 90 per cent of the retailers under the National Industrial Recovery Administration, sales must represent cost of merchandise overhead and net profit. If sales do not pay cost of merchandise and overhead, bankruptcy will result and lack of adequate drug service will become a consumers' problem. A sale without profit is without honor under any code. Without profitable sale there is no means to pay employee no purchasing power —W BRUCE PHILIP *J Am Pharm Assoc* 24 (1935) 298 (7 M C)

PHARMACOLOGY TOXICOLOGY AND THERAPEUTICS

PHARMACOLOGY

Bile Salts—Influence of, on the Nervous System Following Intraspinal Usage Sodium desoxycholate can be introduced in minute doses intraspinally in cats without injury to the cord. Larger doses produce motor and sensory disturbances and death from respiratory paralysis. Traumatized spinal tissue is highly susceptible to even minute doses of bile salts in alcoholic solution though resistant to the same dose in aqueous solution. Spinal fluid protein and cord tissue

reduce the hemolytic action of bile salts—S S LICHTMAN and E L STERN *Proc Soc Exptl Biol Med*, 32 (1935), 1201 (A E M)

Calcium Compounds—Comparative Study of the Absorbability of Reference is made to two preliminary reports which were concerned with dicalcium phosphate, calcium chloride, lactate, glycerophosphate, gluconate, hexacalcium inositol hexaphosphate and calcium lacto phosphogluconate. The present paper deals with the first six. The literature was reviewed in previous reports. The technique is based on the antagonism between magnesium and calcium. Earlier experiments having shown that animals narcotized by magnesium are awakened by injections of calcium salts, and conversely, animals which have absorbed increasing quantities of calcium require greater amounts of magnesium for narcosis. Details of procedure are given and results are tabulated. Arranged according to maximum amount absorbed they appear in following order: lactate, gluconate, chloride, hexacalcium inositol hexaphosphate and dicalcium phosphate (the same) and lastly calcium glycerophosphate. There is a constant rise until the fourth hour when the maximum is reached for all except the chloride which requires five hours. That calcium lactate heads the list agrees with the findings of McGowan and Berghem. The lactic acid radical has a significant influence. Rowe and Kahn have shown that alkaline secretions have an inhibitory influence on the rate of calcium absorption. The authors believe it is reasonable to assume that calcium lactate may be the best calcium compound for oral administration in human subjects as it was in the albino mice used as test animals in these investigations.—A RICHARD BLISS JR, and ROBERT W MORRISON *J Am Pharm Assoc* 24 (1935), 280 (Z M C)

Candicine—Contributions to Pharmacology of Intraperitoneal injection of 6 mg of candicine iodide/100 Gm in adult white rats, produced death from respiratory paralysis, 5 mg / 100 Gm killed 60% of the rats. The rats showed muscular incoordination, trembling and sometimes violent convulsions. In dogs, an intravenous dose of 2-6 mg /Kg suppressed the cardio-regulator effect of the vagus, 6 mg /Kg suppressed the effect of the sciatic nerve, 4-6 mg /Kg suppressed the vascular effect of nicotine and the pressor but not the hypotensor or muscarine effect of tetramethylammonium iodide. In sympathectomized dogs candicine produced a lesser hypertension than in normal dogs due in part to a discharge of adrenaline and in part to a peripheral vascular effect since it persisted, though somewhat diminished, after suprarenalectomy.—F P LUDWEN *Compt rend soc biol*, 118 (1935), 593, through *Squibb Abstract Bull*, 8 (1935), A-499

Carbon Tetrachloride—Experimental Investigation on Its Toxic Action by Repeated Inhalation Exposition of a few minutes in an atmosphere containing carbon tetrachloride is sufficient to produce subacute inflammatory lesions of the liver and kidneys provided exposition is repeated and that the atmosphere is sufficiently rich in carbon tetrachloride. The hepatic lesions seem to be more important than the renal which is characteristic of carbon tetrachloride irrespective of its mode of administration. The lesions are in all respects comparable with those observed following upon the introduction into the organism of small doses of toxic substances. The hepatic lesions, in particular, are constituted by a reactional process of periportal fibrosis, it is a parenchymatous disturbance that is entirely different from that observed in the case of massive intoxication through the digestive tract.—P LANDE and P DERVILLE *Ann Med Legale Criminol Police Sci*, 15 (1935), 25-27 (A P C)

Daphnia—Propagation of, for Experimental Use The propagation of *Daphnia Magna* for laboratory experiments is assured by extremely simple methods merely adding certain animal or plant products commonly available, without special preparation, to water (tap or distilled) suitable for drinking purposes (practically free of chlorine and heavy metals) alkalinized with an excess of calcium carbonate (coarsely crushed marble stone) or precipitated chalk, preferably aerated and kept at room temperature (21° C) in the diffuse light of northern exposure. The cultivation of consecutive generations of suitable experimental animals (females developing parthenogenetically summer eggs) may be assured with any of the common natural manures of animal excretions, provided (1) the amounts given at one time are not excessive as otherwise putrefaction may occur (2) the applications are frequent enough to prevent starvation (3) the accumulation of toxic substances is prevented through fairly frequent (monthly or bi-monthly) renewal of cultures and artificial aeration if necessary (4) a sufficient number of vigorous animals is used to start the daphnia culture. The following food substances were found satisfactory. Dried shredded sheep manure and dried shredded cow manure, dried and malted milk and dried pig

essential that teachers of professional and technical courses have a profound knowledge of fundamentals upon which their specialties rest than that teachers of fundamental subjects have in mind all the important and useful applications of their subject. Good teaching requires that a course be interesting so *judicious* use of applications is permissible but this does not change the general principle —ERNEST LITTLE *J Am Pharm Assoc*, 24 (1935), 307 (Z M C)

Homeopathic Pharmacy—Basic Demands of The author stresses the need of physiological and pharmacological studies and assays for homeopathic medicines —H NEUGEBAUER *Pharm Zentralh*, 76 (1935), 192 (E V S)

Homeopathy Homeopathic practice seems to be rather widely developed in Germany. In the *Süddeutsche Apoth-Ztg* (Feb 22 1935) is the report that 400 pharmacists of southern Germany took a course in homeopathy given by E Bamann. The general outline of the course and its divisions such as "Development of Homeopathy," "Technique of Preparing Dilutions," etc., are described and briefly commented upon —E K *Schweiz Apoth Ztg*, 73 (1935), 172 (M F W D)

Teachers and State Board Examiners—Problems of the Scope of practical pharmacy and dispensing has become more complicated because of the limited amount of practical drug store experience that candidates for registration have and because of the large number of new preparations put on the market for all to learn about. It is necessary for teachers to supply training that once was obtained in drug stores. Teaching processes and procedures of the U S P and N F is not a burden but with hundreds of others and combinations of them added it seems possible to teach no more than basic principles underlying the art of compounding and dispensing. Examiners are confronted with difficult problems like the number and type of prescriptions to be given to an applicant, the number of times an applicant may fill a prescription and how it should be graded. If examiners and teachers were to cooperate plans might be made for more uniform examinations. Since comprehensive examinations are best, the larger the number of preparations the better. It is suggested that 60% consist of U S P and N F preparations with directions given and the remaining 40% prescriptions without directions. Reading original prescriptions is seldom considered but it might be made a part of the test to determine whether the candidate can handle the prescription from the time he receives it until it is turned over to the customer —HARRY W MANTZ *J Am Pharm Assoc*, 24 (1935), 296 (Z M C)

MISCELLANEOUS

Homeopathic Pharmacy in 1934 A review of the work accomplished in homeopathic pharmacy in 1934 —H NEUGEBAUER *Pharm Zentralh* 76 (1935), 212 (E V S)

Profit—The Way Out of the Depression To protect the public, prices must be at a level that allows adequate pharmaceutical service. A code of fair competition must be a guide for ninety per cent of the stores. Laws of the States demand that highly skilled persons sell drugs and if there is only one employee that one must be a registered pharmacist. In small retail stores minimum code wage is not apt to be maximum drug store wage. All fair trade provisions will control selling power of all items controlled by the code. The public must pay the cost of handling all items. This fundamental importance is shown by specific figures. If recovery is to come to 90 per cent of the retailers under the National Industrial Recovery Administration sales must represent cost of merchandise overhead and net profit. If sales do not pay cost of merchandise and overhead bankruptcy will result and lack of adequate drug service will become a consumers problem. A sale without profit is without honor under any code. Without profitable sale, there is no means to pay employee no purchasing power —W BRUCE PHILIP *J Am Pharm Assoc*, 24 (1935), 298 (7 M C)

PHARMACOLOGY, TOXICOLOGY AND THERAPEUTICS

PHARMACOLOGY

Bile Salts—Influence of, on the Nervous System Following Intraspinal Usage Sodium desoxycholate can be introduced in minute doses intraspinally in cats without injury to the cord. Larger doses produce motor and sensory disturbances and death from respiratory paralysis. Traumatized spinal tissue is highly susceptible to even minute doses of bile salts in alcoholic solution though resistant to the same dose in aqueous solution. Spinal fluid protein and cord tissue

reduce the hemolytic action of bile salts—S S LICHTMAN and E L STERN *Proc Soc Exptl Biol Med*, 32 (1935), 1201 (A E M)

Calcium Compounds—Comparative Study of the Absorbability of Reference is made to two preliminary reports which were concerned with dicalcium phosphate, calcium chloride, lactate, glycerophosphate, gluconate hexacalcium inositol hexaphosphate and calcium lacto phospho gluconate. The present paper deals with the first six. The literature was reviewed in previous reports. The technique is 'based on the antagonism between magnesium and calcium earlier experiments having shown that animals narcotized by magnesium are awakened by injections of calcium salts, and conversely animals which have absorbed increasing quantities of calcium require greater amounts of magnesium for narcosis.' Details of procedure are given and results are tabulated. Arranged according to maximum amount absorbed they appear in following order: lactate, gluconate, chloride, hexacalcium inositol hexaphosphate and dicalcium phosphate (the same), and lastly calcium glycerophosphate. There is a constant rise until the fourth hour when the maximum is reached for all except the chloride which requires five hours. That calcium lactate heads the list agrees with the findings of McGowan and Bergheim. The lactic acid radical has a significant influence, Rowe and Kahn have shown that alkaline secretions have an inhibitory influence on the rate of calcium absorption. The authors believe it is reasonable to assume that calcium lactate may be the best calcium compound for oral administration in human subjects as it was in the albino mice used as test animals in these investigations—A RICHARD BLISS, JR, and ROBERT W MORRISON *J Am Pharm Assoc*, 24 (1935), 280 (Z M C)

Candicine—Contributions to Pharmacology of Intraperitoneal injection of 6 mg of candicine iodide/100 Gm in adult white rats produced death from respiratory paralysis. 5 mg / 100 Gm killed 60% of the rats. The rats showed muscular incoordination, trembling and sometimes violent convulsions. In dogs, an intravenous dose of 2-6 mg /Kg suppressed the cardio-regulator effect of the vagus, 6 mg /Kg suppressed the effect of the sciatic nerve, 4-6 mg /Kg suppressed the vascular effect of nicotine and the pressor but not the hypotensor or muscarine effect of tetramethylammonium iodide. In sympathectomized dogs, candicine produced a lesser hypertension than in normal dogs, due in part to a discharge of adrenaline and in part to a peripheral vascular effect since it persisted though somewhat diminished after suprarenalectomy—F P LUDUENA *Compt rend soc biol*, 118 (1935), 593, through *Squibb Abstract Bull*, 8 (1935), A-499

Carbon Tetrachloride—Experimental Investigation on Its Toxic Action by Repeated Inhalation Exposition of a few minutes in an atmosphere containing carbon tetrachloride is sufficient to produce subacute inflammatory lesions of the liver and kidneys provided exposition is repeated and that the atmosphere is sufficiently rich in carbon tetrachloride. The hepatic lesions seem to be more important than the renal which is characteristic of carbon tetrachloride irrespective of its mode of administration. The lesions are in all respects comparable with those observed following upon the introduction into the organism of small doses of toxic substances. The hepatic lesions in particular, are constituted by a reactional process of periportal fibrosis, it is a parenchymatous disturbance that is entirely different from that observed in the case of massive intoxication through the digestive tract—P LANDE and P DERVILLE *Ann Med Legale Criminol Police Sci* 15 (1935), 25-27 (A P-C)

Daphnia—Propagation of, for Experimental Use The propagation of *Daphnia Magna* for laboratory experiments is assured by extremely simple methods, merely adding certain animal or plant products commonly available, without special preparation to water (tap or distilled), suitable for drinking purposes (practically free of chlorine and heavy metals), alkalinized with an excess of calcium carbonate (coarsely crushed marble stone), or precipitated chalk preferably aerated and kept at room temperature (21° C) in the diffuse light of northern exposure. The cultivation of consecutive generations of suitable experimental animals (females developing parthenogenetically summer eggs) may be assured with any of the common natural manures of animal excretions provided (1) the amounts given at one time are not excessive as otherwise putrefaction may occur (2) the applications are frequent enough to prevent starvation (3) the accumulation of toxic substances is prevented through fairly frequent (monthly or bi monthly) renewal of cultures and artificial aeration if necessary (4) a sufficient number of vigorous animals is used to start the daphnia culture. The following food substances were found satisfactory. Dried, shredded sheep manure and dried shredded cow manure dried and malted milk and dried pig

blood Plant products such as cotton seed meal and soy bean flour were also found satisfactory, both particularly advantageous with the addition of 0.003% urea. Certain micro organisms such as infusoria, algæ, bacteria and yeast also prove of value. The host of enemies which may destroy daphnia can be rather readily kept out of cultures or, if found present, usually quickly removed. Careful attention to the details of propagation which are given at great length assures unequalled uniformity in age, size and vitality of the daphnia. Over 1000 may be obtained in one month starting with six animals.—*Am J Pharm*, 107 (1935), 103 (R R F)

Digitalis—Studies on the Bioassay of II New Leg-Vein and Intramuscular Guinea Pig Methods Investigation of the value of the guinea pig in the assay of digitalis has had further study. New leg-vein and intramuscular minimum lethal dose methods with simplified technique have been devised and checked against older methods. Relative occurrence of cardiac and respiratory failure was investigated because of the question of primary cause of death. Detailed methods are given. Experimental procedure is described, and a typical protocol of the course of events in the new leg-vein method is given. The symptoms described are identical with those of the subcutaneous and new intramuscular methods, except that they appear a little earlier. One table of typical results indicates that respiratory failure is the primary cause of death. Another table is a summary of minimum lethal and minimum systolic standstill doses obtained on four tinctures by guinea-pig and frog methods. Analysis of the latter table shows that the minimum lethal dose in the leg-vein method is smaller than that in the subcutaneous method. Since heart beats could be felt through chest wall for some time after respiration had ceased the author questions the soundness of Richaud's conclusion that respiratory failure makes the guinea pig valueless as an assay animal for digitalis which is mainly used for its effect on the heart. Dale and Burn have emphasized that a test does not have to be identical with therapeutic effect so long as it measures the active principle. The subcutaneous, new leg-vein and new intramuscular guinea pig methods have the advantage that anesthesia is unnecessary, artificial respiration is not employed, and operative procedure is less severe. All three guinea pig methods give good results but time and technique affect preference.—*JAMES H. DEFENDORF J Am Pharm Assoc* 24 (1935), 276 (Z M C)

Digitalis—U S P Standards for The U S P X standard and the standards of some other pharmacopœias are stated. The present standard for U S P digitalis is about four fifths that of the International Standard and there are serious objections to maintaining it. It furnishes a market for digitalis that does not meet requirements of the European markets. Standards must be attainable and if the International Standard is adopted for U S P XI they can be easily met. The author has produced a dried leaf of twice the activity of the U S P standard and to adopt the International Standard means raising the present standard 25 to 30%. If that were done tincture of digitalis U S P XI would be equal in strength to that official in many leading European countries. The value of a standard powder in bringing together the results of different workers has been emphasized previously. There is no unanimity on the question of biological testing of digitalis. It is well known that tincture of digitalis tested on frogs at intervals of three months or more will show much greater loss in strength than when tested at similar intervals on cats. This has been demonstrated by Wokes, Foster and Van Dyke who studied the effect of aging found losses by both assay methods but much greater in the frog method. The cat method has the advantage also that it affords a means of calculating the physiological dose for a patient. Adoption of the International Standard for digitalis in U S P XI and the recognition of 100 mg of this powder as an International Unit using cats as test animals, would provide physicians with products whose dose would be easily calculated by the method of Eggleston. A national Standard Digitalis Powder for the United States should be prepared from mixed powdered leaves from different sources and it would not be necessary to adjust to the International Standard but simply to determine the ratio between the potencies of the two standard powders. Adoption of the International Standard would simply require a definition for the unit of digitalis as the amount of activity contained in 0.1 Gm of the International Standard Digitalis Powder so that 1 Gm of the International Standard represents 10 units.—*F A UPSHER SMITH J Am Pharm Assoc* 24 (1935) 272 (Z M C)

1-2-4 Dinitrophenol—Blood Sugar Changes after Dinitrophenol causes hyperglucemia in dogs when injected subcutaneously. It also increases the rate at which glucose is removed from

the blood after quantities of the latter have been given intravenously —W F ASHE, JR *Proc Soc Exptl Biol Med*, 32 (1935), 1062 (A E M)

1-2-4 Dinitrophenol—Effect of, on Oxygen Uptake of Rat Tissue Neither treatment of the animals with dinitrophenols while still alive nor action of the substance on the tissue in Ringer's solution caused a definite change in the oxygen uptake —EDWARD MUNTWYLER *Proc Soc Exptl Biol Med*, 32 (1935), 1060 (A E M)

2-4 Dinitrophenol—Effects of, on Respiration of Commercial Cake Yeast Dinitrophenol at a given concentration will either stimulate or inhibit the respiration of yeast depending on the pH level Only the undissociated form is of influence —J FIELD, 2ND, A W MARTIN and S M FIELD *Proc Soc Exptl Biol Med*, 32 (1935), 1043 (A E M)

Insulin—Blood Sugar Curves in Normal and Diabetic Dogs after Intravenous Injections of The minimum of blood sugar in the normal dog is reached after 20-30 minutes Return to normal follows within 90 minutes Doses of 0.3 units per Kg cause in the diabetic dog decreases from 40-80% lasting one hour or more, with prolonged time of return to normal The development of diabetic conditions could be shown already 18 hours after pancreatectomy, but the final curve was obtained only after 138 hours —B N BERG J GROSS, J McAFEE and T F ZUCKER *Proc Soc Exptl Biol Med*, 32 (1935), 1080 (A E M)

Insulin, Irradiated—Stimulation of the Adrenal Medulla by Insulin irradiated with X-rays has no influence on the blood sugar It causes, however, a pronounced decrease in blood amino acids in normal animals This effect does not appear, when the adrenal medulla is destroyed —J MURRAY LUCK and GORDON M RICHMOND *Proc Soc Exptl Biol Med*, 32 (1935), 1056 (A E M)

Oysters—Food Value and Anti-Anemic Power of Comparative blood tests were carried out on dogs that were fed on diets with and without oysters, respectively The results consistently confirmed Pease's results on the anti anemic value of oysters —LÉON BINET and V STRUMZA *Paris-Medical*, 23 (1933), No 26, 28, through *Bull Soc Sci Hyg Aliment* 23 (1935) 53 (A P-C)

Quinine—Effect of, on Circulatory System. The injection of 2 mg quinine ethanesulphonate in 2 cc physiologic sodium chloride solution into the femoral artery of the paw of a dog anesthetized with chloralose, bivagotomized at the neck and submitted to artificial respiration increased the rate of blood flow approximately 5 fold This vasodilation lasted a rather long time since 2 minutes after the beginning of the action of quinine the rate of blood flow was still about twice as fast as before injection —RAYMOND HAMET *Compt rend soc biol*, 118 (1935) 231, through *Squibb Abstract Bull*, 8 (1935) A 551

Sodium Bromide—Experimental Study of Toxicity of, in Intravenous Injection From experiments on rabbits and clinical observations it is concluded that the toxicity of sodium bromide is relatively small, while the dose that can be supported safely is variable, it would seem that with a dose of less than 1 Gm per Kg body weight (in rabbits) there is no danger of accidents Sodium bromide has a marked anesthetic action, but insufficient to permit of serious operations it must be completed by a general anesthesia, which is however, rendered easier and free from danger High blood pressure or kidney troubles may in some cases contraindicate the use of sodium bromide —A PATOIR and G PATOIR *Ann Med Legale Criminol Police Sci* 15 (1935) 53-58 (A P-C)

Vitamin E—Vestibular Function Test for, Deficiency in the Rat. The vestibular test consists in at least 3 successive observations of nystagmus duration the direction of rotation being reversed after each observation The durations of nystagmus following clockwise rotations are averaged and similarly the durations following counter clockwise rotations The mean of these two averages is taken as a result of the test Normal animals give a nystagmus duration of 7-10 seconds during the period of rapid growth, diminishing to 5-8 seconds after maturity Vitamin B deficient animals show a progressive increase in the duration of nystagmus following the standardized rotation which becomes significant in the third week and reaches a value of 12-16 seconds before the appearance of any other neurologic symptom —C F CHURCH U S P Pharmacopœial Conference Committee on Vitamin B₁ Standardization Bulletin 7 (3/12/35), 35, through *Squibb Abstract Bull* 8 (1935), A-520

TOXICOLOGY

Cinchophen—Peptic Ulcers Produced by Feeding, to Mammals Other Than the Dog Cats are very susceptible to cinchophen, guinea pigs moderately and rabbits very resistant — S O SCHWARTZ and J P SIMONDS *Proc Soc Exptl Biol Med* 32 (1935), 1133

(A E M)

Poisonings—Common, in General Practice The author reviews cases of poisoning common in general practice including methods of treatment and the symptoms. Specifically he includes poisoning from carbon monoxide bromides iodides arsenic mercury barbituric acid compounds amidopyrine dinitrophenol cinchophen phenolphthalein, lead and benzene in industrial poisoning and poisoning from cosmetics and dyes — V F STOCK *Bull Acad Med Toronto* 8 (1935) 126, through *Squibb Abstract Bull*, 8 (1935), A 549

Tartar Emetic—Effects of, on the Leukocyte Count Following intravenous inoculation with 1% solution of potassium antimonyl tartrate the leukocyte count was reduced in 6 of 9 patients who exhibited leukocytoses of abnormal cells — S P LUCIA *Proc Soc Exptl Biol Med* 32 (1935) 1109

(A E M)

THERAPEUTICS

Amebiasis—Observation on Antigens for Complement Fixation in The mucoid material from the infected intestine of dogs is extracted with absolute alcohol (7 parts) at 45° for 15 days. The filtered solution is diluted with 3 to 5 parts of normal saline and tested for hemolytic and complementary and antigenic properties. It is as active as extracts prepared from cultures of *E histolytica* — CHAS F CRAIG and L C SCOTT *Proc Soc Exptl Biol Med* 32 (1935), 958

(A E M)

Calcium—Relation of, to Blood Formation The presence of calcium in the diet deficient in certain other organic elements both cures and prevents the development of the expected polycythemia and concomitant chronic anemia — JAMES M ORTEN, ARTHUR H SMITH and LAFAYETTE B MENDEL *Proc Soc Exptl Biol Med*, 32 (1935), 1093

(A E M)

Diphtheria—Hyperglucemia in Carbohydrate Metabolism and Treatment with Dextrose-Insulin The deviation of glucemia during diphtheria can be either way and is generally of little significance. The glucose tolerance however, shows frequently a disturbance especially in severe cases. The disturbance is of hepatic origin. Insulin is of no value — ISAAC NATIN and CORNELIA DA RIN *Semana med (Buenos Aires)* 42 (1935), 1055

(A E M)

Drugs—Dynamic Action of The author discusses the action of drugs in different situations and classifies the different types of symptoms involved in the prescribing of remedies — THOMAS M STEWART *J Am Inst Homeop*, 28 (1935), 208, through *Squibb Abstract Bull*, 8 (1935) A 535

Drugs—Rationale of New Uses for Some Old Considering some of the old drugs for which more extended uses have been found attention may be directed to carbon dioxide. The therapeutic applications of the respiratory functions of carbon dioxide are many and varied. When the depressed respiratory center requires stronger stimulation in cases of narcotic poisoning carbon dioxide is beneficial. It is used in the early stages of anesthesia to increase the respiratory excursion and to stimulate the absorption of the anesthetic and after anesthesia to increase the depth of breathing. Carbon dioxide has been used in cases of asthma and hay fever, in which it is suggested that the increased hydrogen ion concentration of the blood reduces the sensitivity of the tissues to anaphylactic stimulants. Frequently the virtue of a drug depends on some physical phenomenon such as its osmotic tension in solution. The purgative effects of magnesium sulphate depend on this fact. Another physical property that of adsorption is responsible for a restoration to popularity of certain drugs. The virtue of kaolin depends on the large surface exposed by a quantity of the drug in a colloidal state of fineness by means of which it adsorbs bacteria and toxins alkaloids putrefactive amines ptomaines etc thus delaying or preventing absorption from the bowel. A more recent application of its adsorbent qualities is to employ it by insufflation to nose and throat for removing bacteria in diphtheria carriers. Recent research has indicated a new use for copper in the form of the sulphate or other ionizable salt. Sachs regards copper as a biological catalyst for the utilization of iron in the synthesis of hemoglobin. Many other instances of new uses for old drugs are given in the article — B L STANTO *Australasian J Pharm* 16 (1935) 174

(T G W)

PHARMACEUTICAL ABSTRACTS

EDITOR A G DuMEZ 32 S Greene Street, Baltimore, Maryland

ABSTRACTORS

WILLIAM B BAKER
JOHN C BAUER
GERSTON BRUCH
ARTHUR H BRYAN
HENRY M BURLAGE
ALBERT H CLARK
ZADA M COOPER
GUSTAV E CVALINA
AMELIA DeDOMINICIS
MELVIN F W DUNKER
PERRY A FOOTE
RALPH R FORAN
SAMUEL W GOLDSTEIN
H B HAAG
WILLIAM H HUNT
CASIMER T ICHNIEWSKI

ROLAND E KREMBERS
CLIFFORD S LEONARD
L LAVAN MANCHEY
ARTHUR E MEYER
A PAPINEAU COUTURE
HARRY ROSEN
A S SCHWARTZMAN
EMANUEL V SHULMAN
EDGAR B STARKEY
MARVIN R THOMPSON
E G VANDEN BOSCHE
GLENN S WEILAND
ANNA E WHITE
ELMER H WIRTH
THOMAS G WRIGHT
MAX M ZERVITZ

CONTENTS

New Remedies

Synthetics	142
Specialties	142

Bacteriology

152

Botany

155

Chemistry

General and Physical	156
Inorganic	156

Organic

Alkaloids	157
Essential Oils and Related Products	160
Fixed Oils, Fats and Waxes	161
Glycosides Ferments and Carbohydrates	161
Other Plant Principles	162
Unclassified	162

Biochemistry	163
--------------	-----

Analytical	164
------------	-----

Toxicological Chemistry	172
-------------------------	-----

Pharmacognosy

Vegetable Drugs	172
-----------------	-----

Pharmacy

Galenical	174
-----------	-----

NEW REMEDIES

SYNTHETICS

Analeptin—Preparation and Chemical Composition of Synthetic Description of the most important synthetic stimulants such as adrenaline, caffeine, camphor, hexeton, Cardiazol, Cornin and also of a new synthetic "Analeptin" (tetrahydrocaroyliden 2 menthanonamine) is given. Analeptin in doses of 0.01 Gm. exercises a stimulating action on respiration, heart and blood circulation systems. According to the chemical structures, it is composed from some 25 chemical substances and its first analytical reaction is due to its iso or heterocyclic benzene ring and then secondly through hydration of the same. A ring with a carbonyl group has a weak cardiac action, and a ring with alkyl group has a strong cardiac action.—J. ERDOS, *Magyar Gyógyszeres Tudományi Társaság Értesítője*, 10 (1934), 407-423, through *Chem. Zentr.*, 106 (1935), 926.

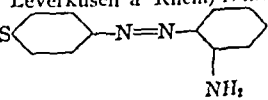
(G B)

Dyes—Study of Injectable A study of the dyes, gentian violet and methylene blue was made. The above dyes were free from any poisonous metals such as arsenic, lead and zinc. However, some iron was present which was not objectionable. The above metals may be present due to the method of preparation of the dyes. One per cent solutions of the dyes were injected into the marginal vein of 2.5 Kg. rabbits. Results obtained indicate methylene blue injections may be of value in the treatment of leprosy. The dyes were mixed with solutions of disodium phosphate, sodium acetate, sodium citrate, sodium glycerophosphate, sodium cacodylate and sodium chaulmoograte, and test injections made. A mixture of methylene blue and sodium chaulmoograte appeared to be of interest. This mixture was prepared as follows: a solution containing 10 Gm. of methylene blue, 10 cc. N/10 sodium hydroxide and 500-cc. saccharose (94 parts in 1000 cc.) is mixed with a solution containing 250 cc. N/10 sodium chaulmoograte, made up to 500 cc. with a solution of saccharose (94 parts in 1000). The resulting mixture will have a pH of 7.24 and should be injected as rapidly as possible.—J. C. PEIRER, *J. pharm. chim.* 21 (1935), 389.

(M M Z)

Esmodil (Bayer I. G. Farbenindustrie Aktiengesellschaft, Leverkusen) is chemically pure trimethylmethoxypropenylammonium bromide. It is a white, crystalline powder melting at 169° C. and is very soluble in water and in alcohol. It is a specific intestinal peristaltic and is indicated in intestinal atony and in post-operative urine suppression. The usual dose is the intramuscular or subcutaneous injection of 1 cc. of a 3% isotonic solution.—*Pharm. Ztg.*, 80 (1935), 311.

(G E C)

Prontosil (Bayer I. G. Farbenindustrie Aktiengesellschaft, Leverkusen a. Rhein) is the hydrochloride of 4-sulphonamide 2',4'-di-amino azo benzene. HNO_2S  NH_2

NH_2 HCl. It is moderately soluble in cold water, alcohol and acetone and melts with decomposition at 247° to 251° C. It is dispensed in tablets containing 0.3 Gm. of prontosil mixed with starch and talc and also in solutions containing 0.05 Gm. prontosil and 0.85 Gm. dextrose per 20 cc. The preparation is recommended for use against septic angina, septic scarlet fever, septic diphtheria, erysipelas, polyarthritis rheumatica and postpartum sepsis. Intravenously, it does 10 to 20 cc. daily. Orally 1 to 2 tablets are given daily to supplement injection therapy. A 1% to 2% solution is also used for disinfection of the oral cavity.—*Pharm. Ztg.*, 80 (1935), 276. (G E C)

Redoxon (Hoffmann-La Roche and Co. A. G. Berlin) is synthetic vitamin C. It is marketed in tablet form, each tablet containing 50 mg. of the vitamin.—*Deut. Med. Wochschr.* 61 (1935), 178. (H R)

SPECIALTIES

Algoln Tablets (R. E. Müller & Co., Berlin-Pankow) consist of acetylsalicylic acid, lithium carbonate, quinine hydrochloride and phenylquinoline carbonic acid. They are used for neuralgia, migraine, headache, lumbago, rheumatism and grippe. 1 to 2 tablets are to be taken two to four times a day.—*Pharm. Ztg.*, 80 (1935), 299. (G I C)

Ambinon is an extract prepared from the anterior lobe of the pituitary gland and contains thyroid activating and gonad stimulating hormones, both hormones being standardized by biological tests. Ambinon is indicated in obesity, menstrual disorders, gonad dysfunction and

infantilism The dose recommended is one ampul daily Ambinon is supplied in powder form in ampuls with the corresponding number of ampuls of sterile distilled water to be used as solvent It is issued in boxes containing three ampuls—*Quart J Pharm Pharmacol*, 8 (1935), 157

(S W G)

Amphopulmon Ampuls (Chem Fabrik F L Kwizda, Korneuburg) is a sterile solution of purified basic quinine, camphor, menthol, in a mixture of ethereal and fatty oils—*Pharm Presse*, 40 (1935), 105

(M F W D)

Amphyl is a non corrosive antiseptic which is non irritant, and non staining, and has a low toxicity Its coefficient against *B typhosus* is 12.4 and against *Staph aureus* 5.6 It is claimed to be uniform in action against a wide range of pathogenic organisms, and to be efficient in the presence of organic matter Amphyl has a low surface tension which remains constant for all the recommended dilutions A slight cloudiness is formed with hard water A strength of 0.5 to 1% should be used for lotions, douches and gargles, but for sterilization of instruments and rubber gloves a 2% solution is required The solutions are odorless and do not cause irritation when applied to broken or unbroken skin surfaces Amphyl is supplied in 4 oz., 16 oz. and 32 oz. bottles, and in 1-gallon tins—*Quart J Pharm Pharmacol*, 8 (1935), 157

(S W G)

Animal Charcoal Pills (Dr Kronik and Ph Mr Edels, Vienna, 7 dist.) Each contains 0.25 Gm animal charcoal along with magnesium sulphide, 20 to a package—*Pharm Presse* 40 (1935), 105

(M F W D)

Antrypol is the symmetrical ureide of the sodium salt of *m* aminobenzoyl *m* amino *p* methyl benzoyl 1 naphthyl amino 4,6,8 trisulphate It is recommended for the treatment of trypanosomiasis, and it is claimed that its use does not cause ocular lesions which are often a sequel to the arsenical treatment Antrypol is effective alone if given in the early stages of infection by *T gambiense*, but in infections by *T Rhodesiense*, and in all cases in which the infection has reached the central nervous system combined treatment with an arsenical preparation is recommended Best results are obtained by intravenous injection, one every third day, first injection 1 Gm second injection 2 Gm and four injections of 3 Gm If there is nephritis, smaller doses are suggested but nothing less than 5 to 10 injections of 1 Gm each is likely to be of any permanent value Antrypol is supplied in boxes of 6 tubes containing 1 Gm, 2 Gm or 3 Gm, and in bottles containing 50 Gm—*Quart J Pharm Pharmacol*, 8 (1935), 157

(S W G)

Aquiox tonic tablets are composed of a concentrate prepared from the tips of selected seaweeds It contains in balanced proportions potash, soda, lime, magnesia, iron, chlorine, iodine, sulphur in various forms, phosphates, carbonates, sulphates, nitrogen and carbon compounds Aquiox is recommended as a general tonic The tablets are supplied sugar coated and also talc coated in bottles of three sizes—*Quart J Pharm Pharmacol*, 8 (1935), 158

(S W G)

Bellergal (Sandoz A G Nurnberg) is supplied in the form of coated tablets containing 0.3 mg ergotamine 0.1-mg Bellafofin and 20 mg phenyl-ethyl barbituric acid—*Deut Med Wochschr*, 61 (1935), 176

(H R)

Bronchovydrin Ointment is composed of papavydrin (papaverine cumydrine) small quantities of adrenal hormones, hypophysis extract and nitrates in an ointment base with a slightly acid reaction It is recommended for the treatment of hay fever and other allergic conditions causing nasal catarrh—*Quart J Pharm Pharmacol*, 8 (1935), 158

(S W G)

Calmosine is the trade name given by Kon Pharm Fabrieken Brocades & Steeman and Pharmacia (Netherlands) to amidopyrine diethylbarbiturate—*Pharm Weekblad*, 72 (1935), 867

(E H W)

Calsimil tablets contain in each 10 grain tablet 5 grains of calcium sodium lactate and 500 international units of pure crystalline vitamin D It is claimed that this preparation presents the calcium in a readily assimilable form and the vitamin D ensures that a large proportion of the calcium absorbed is retained in the reserve depots of the system for future utilization Calsimil is suggested for the treatment of chilblains, general debility, certain skin affections, pregnancy and other disorders due to calcium deficiency The dosage is 1 to 6 tablets daily which can be swallowed or dissolved in the mouth Calsimil is supplied in bottles of 60 tablets—*Quart J Pharm Pharmacol*, 8 (1935), 158

(S W G)

Citro-Gold (Pharm Laboratorium K Badenberg, Essen Steele), a preparation of lemon witch hazel, glycerin and boric acid is used for coarse and chapped skins—*Pharm Zentralh* 76 (1935), 180

(E V S)

Crinex is a total extract of ovary, in liquid form for administration by mouth. It is prepared from the ovaries of young animals and is rich in folliculin and contains all the other hormones. It is soluble in water and does not lose its activity in the presence of acid, alkali or alcohol. It is not attacked by pepsin or trypsin. It is indicated in conditions of partial or total lack of ovarian secretion. Crinex is standardized to contain 30 mouse units per cc. The average dose is 12 to 25 drops per day taken in 2 or 3 doses between meals. Crinex is supplied in bottles containing 240 mouse units (approximately 280 drops).—*Quart J Pharm Pharmacol*, 8 (1935) 158 (S W P)

Cysteine Hydrochloride, Buffered (E R Squibb & Sons, New York, N Y) Ampuls containing cysteine hydrochloride with sufficient sodium borate so that when diluted they yield a solution of about pH 4. It is used as a wet dressing on varicose ulcers, traumatic ulcers, post-operative wounds, suppurated carbuncles, decubital and trophic ulcers and extensively denuded surfaces upon which skin grafting has been unsuccessful. It is contraindicated in cases of malignant ulcerations or those classed as premalignant lesions and X-ray dermatitis. It is marketed in packages of five 0.5 Gm ampuls and 5 Gm ampuls.—*Drug Circ*, 79 (May 1935), 29 (T G W)

Darmiol (Homoopathische Centralapotheke gegr 1865 von Prof Dr Mauch, Goppingen) is a pure acid free mineral oil flavored with peppermint. It is useful for intestinal sluggishness and stubborn constipation.—*Pharm Zentralh*, 76 (1935), 180 (E V S)

Diffundol-Salbe (Diffundol G m b H, Frankfurt a M, Sud) is a specially prepared sodium soap with the addition of ethereal oils, rectified oil of turpentine, sulphur compounds and formaldehyde. It is used for rheumatism, gout, ischias and arthritis deformans.—*Pharm Zentralh*, 76 (1935) 215 (E V S)

Diphtheria-Formol-Toxoid SS Dresden (Sächsisches Serumwerk A G, Dresden) is an albumin free serum, the antigen value of which is unaltered by the addition of formaldehyde. It may be used subcutaneously or intramuscularly.—*Pharm Zentralh*, 76 (1935), 180 (F V S)

Diphtheria-Toxin-Antitoxin-Gemische neutral T A SS Dresden (Sächsisches Serumwerk A G, Dresden) is an active neutral immunizing mixture of diphtheria toxin and antitoxin from cattle or horses used for subcutaneous inoculation. Phenol (0.5%) is used as a preservative.—*Pharm Zentralh*, 76 (1935), 181 (E V S)

Dolosin (Friedrich Apotheke O Gerlach, Berlin O 112) preparations are marketed in capsule form as follows: Dolosin A for headaches (dimethylaminopyrazolone, phenacetin, acetylsalicylic acid), Dolosin G for the grippe (phenacetin, dimethylaminopyrazolone, quinine hydrochloride, acetylsalicylic acid), Dolosin N for neuralgias (caffeine, phenacetin, dimethylaminopyrazolone, acetylsalicylic acid), Dolosin O for toothaches (amidopyrine, acetylsalicylic acid, veramon).—*Pharm Zentralh*, 76 (1935), 181 (E V S)

Draconal (Dr R E Muller & Co, Berlin Pankow) is a sedative tablet containing 0.23 Gm of diethylbarbituric acid, 0.15 Gm of bromisovalerianylurea, and 0.12 Gm of paracetophenetidin.—*Pharm Zentralh*, 76 (1935) 215 (E V S)

Elixir Alycin (Wm S Merrell Co, Cincinnati, Ohio), an elixir containing 4 1/2 grains of salicylate and 9 grains of alkali in an elixir base. It is used in conditions where salicylates are indicated: colds, tonsillitis, influenza, neuralgic complaints, rheumatism and arthritis. It is supplied in 4- and 16-ounce bottles.—*Drug Circ*, 79 (April 1935) 30 (T G W)

Erinol (Pfau Apotheke Th Thurn Mainz) an inhalant for colds and throat catarrh is composed of refined camphor, mentho, vanilla oil and purified paraffin oil.—*Pharm Zentralh*, 76 (1935) 181 (F V S)

Esmodil (Bayer I G Farbennindustrie A G, Leverkusen a Rh) an injectable intestinal tonic is a 1 cc ampul containing a 3 parts per million aqueous isotonic solution of trimethylmethoxypropylammonium bromide. It is used in intestinal atony after laparotomy or other difficult operative interferences in infectious diseases with peritoneal irritation after childbirth or septic abortions.—*Pharm Zentralh*, 76 (1935) 215 (F V S)

Eubion is a vitamin A concentrate issued in the form of chocolate tablets. The vitamin A concentrate has an activity of approximately 10,000 Carr Price units and each tablet is equivalent in vitamin A to one tablespoonful (14.2 cc) of best quality cod liver oil with a suitable amount of vitamin D. It is claimed to be not only of considerable value to growing children but also a

useful prophylactic against common cold in adults Eubion does not cause gastric disorder, and can be given where cod liver oil cannot be tolerated One or two tablets daily is recommended for children In severe infections in adults, four or five tablets may be given daily Eubion is issued in tins of 24 tablets—*Quart J Pharm Pharmacol*, 8 (1935), 159 (S W G)

Eupragin (Chem Fabrik Aethyha G m b H, Mainz) ampuls contain sodium sulphate (4.8%) and potassium sodium tartrate (1%) It is indicated for muscular rheumatism and lumbago—*Pharm Zentralh*, 76 (1935), 181 (E V S)

Gadoment (E L Patch Co, Boston, Mass) Gadus Ointment (Patch) is a preparation of cod liver oil for the treatment of burns and other skin lesions It is reported by the manufacturer to contain specially treated cod liver oil 70%, phenol 0.375% in a special wax base Marketed in tubes, one pound and five pound containers (S W G)

Gastro-Lymphon (Bineuco G m b H, Weisbaden) an intestinal regulator, is composed of Ext Colombo, gentian, juniper, condurango, curcuma chamomile, peppermint, potassium bromide, potassium bicarbonate, arsenic and formaldehyde—*Pharm Zentralh*, 76 (1935), 181 (E V S)

Genitone (Win S Merrell Co Cincinnati, Ohio) The green drugs of *virburnum prunifolium*, *passiflora incarnata* and *pulsatilla*, together with colorless hydrastis, in an aromatic cordial Its action is that of a mild sedative, anti spasmodic and analgesic and it is indicated in the treatment of amenorrhea dysmenorrhea, menorrhagia and during puberty and the climacteric It is supplied in pint bottles—*Drug Circ*, 79 (May 1935), 28 (T G W)

Glucostrophin (Labopharma Dr Laboschin G m b H Berlin) is marketed in two strengths the weaker containing 20% of glucose and 0.00025 Gm of strophanthin, while the stronger contains 0.0005 Gm of strophanthin—*Pharm Zentralh*, 76 (1935) 105 (E V S)

Glutamiron (Calco Chemical Co Inc, Bound Brook, N J) A combination of glutamic acid, ferrous glutamate and ferrous chloride each tablet containing 75 mg of available iron This material must be given under the care of a physician and continued laboratory work is essential to check the results It is used as a hematinic and gastric stimulant It is supplied in bottles of 100 500 and 1000 tablets—*Drug Circ*, 79 (April 1935) 30 (T G W)

Goebin (Heinr Adolf Goebel Steinhagen in Westf), a preparation of diluted spirits mucilage of acacia and precipitated sulphur, is used for skin eruptions—*Pharm Zentralh*, 76 (1935), 181 (E V S)

Gonococcus Filtrate, Corbus-Ferry (Parke, Davis & Co, Detroit, Mich) is a standardized bouillon filtrate of the gonococcus, containing the soluble specific extracellular toxin, and designed for intradermal injection It is claimed to develop specific active immunity against the gonococcus It is indicated in both acute and chronic cases of gonorrheal infection It is supplied in packages containing a 2-cc vial of filtrate and a 2-cc vial of diluent—*Drug Circ*, 79 (May 1935), 28 (T G W)

Gynergen (Sandoz Chemical Works, Inc Distributors E Fougere & Co, Inc) Ergotamine tartrate in the pure and stable form The ampul solution produces a prolonged tonic uterine contraction and is painless and non-irritant It is employed in obstetrics and gynecology to prevent or control uterine hemorrhage, in the puerperium to favor involution and prevent puerperal complications, in sympatheticotomies such as migraine headache to relieve acute seizures It is supplied in 0.5-cc and 1 cc ampuls, 0.001-Gm tablets, and 0.1% solution—*Drug Circ*, 79 (April 1935), 31 (T G W)

Halicaps (Norwich Pharmacal Co, Norwich, N Y) Each capsule contains not less than 3 minims of halibut liver oil, vitamin tested to contain not less than 55,100 units of vitamin A and 767 units of vitamin D per Gm Each capsule is the equivalent in vitamin A of at least four teaspoonfuls of standard cod liver oil and contains not less than 9414 units of vitamin A and not less than 131 units of vitamin D It is indicated in rundown conditions due to a deficiency of vitamin A It is supplied in boxes of 50 capsules—*Drug Circ*, 79 (April 1935), 31 (T G W)

Halmagon is a combination of the halogen salts of magnesium It is supplied as tablets for oral administration, as an emulsion for intramuscular injection and as an isotonic solution for rectal injection Each tablet contains magnesium chloride 0.395 Gm magnesium bromide 0.0133 Gm, magnesium iodide 0.00067 Gm, magnesium fluoride 0.006 Gm, made up to 0.45 Gm with excipient Each ampul of the emulsion contains in 5 cc approximately 34 grains of halogen salts consisting of chloride 2.137 Gm, bromide 0.58 Gm, iodide 0.00039 Gm, fluoride 0.00028 Gm

Crinex is a total extract of ovary, in liquid form for administration by mouth. It is prepared from the ovaries of young animals and is rich in folliculin and contains all the other hormones. It is soluble in water, and does not lose its activity in the presence of acid, alkali or alcohol. It is not attacked by pepsin or trypsin. It is indicated in conditions of partial or total lack of ovarian secretion. Crinex is standardized to contain 30 mouse units per cc. The average dose is 12 to 25 drops per day taken in 2 or 3 doses between meals. Crinex is supplied in bottles containing 240 mouse units (approximately 280 drops)—*Quart J Pharm Pharmacol*, 8 (1935) 158 (S W G)

Cysteine Hydrochloride, Buffered (E R Squibb & Sons, New York, N Y) Ampuls containing cysteine hydrochloride with sufficient sodium borate so that when diluted they yield a solution of about pH 4. It is used as a wet dressing on varicose ulcers, traumatic ulcers, post-operative wounds, suppurated carbuncles, decubital and trophic ulcers and extensively denuded surfaces upon which skin grafting has been unsuccessful. It is contraindicated in cases of malignant ulcerations or those classed as premalignant lesions, and X ray dermatitis. It is marketed in packages of five 0.5 Gm ampuls and 5 Gm ampuls—*Drug Circ*, 79 (May 1935) 29 (T G W)

Darmiol (Homoopathische Centralapotheke, gegr 1865 von Prof Dr Mauch Goppingen) is a pure acid free mineral oil flavored with peppermint. It is useful for intestinal sluggishness and stubborn constipation—*Pharm Zentralh*, 76 (1935) 180 (E V S)

Diffundol-Salbe (Diffundol G m b H Frankfurt a M Sud) is a specially prepared soda soap with the addition of ethereal oils, rectified oil of turpentine, sulphur compounds and formaldehyde. It is used for rheumatism, gout, ischias and arthritis deformans—*Pharm Zentralh*, 76 (1935) 215 (E V S)

Diphtheria-Formol-Toxoid SS Dresden (Sächsisches Serumwerk A G Dresden) is an albumin free serum, the antigen value of which is unaltered by the addition of formaldehyde. It may be used subcutaneously or intramuscularly—*Pharm Zentralh*, 76 (1935) 180 (E V S)

Diphtheria-Toxin-Antitoxin-Gemische neutral T A SS Dresden (Sächsisches Serumwerk A G, Dresden) is an active neutral immunizing mixture of diphtheria toxin and antitoxin from cattle or horses used for subcutaneous inoculation. Phenol (0.5%) is used as a preservative—*Pharm Zentralh*, 76 (1935) 181 (E V S)

Dolosin (Friedrich Apotheke, O Gerlach Berlin 0 112) preparations are marketed in capsule form as follows: Dolosin A for headaches (dimethylaminopyrazolone, phenacetin, acetylsalicylic acid), Dolosin G for the grippé (phenacetin, dimethylaminopyrazolone, quinine hydrochloride, acetylsalicylic acid), Dolosin N for neuralgias (caffeine, phenacetin, dimethylaminopyrazolone, acetylsalicylic acid), Dolosin O for toothaches (amidopyrine, acetylsalicylic acid, veramon)—*Pharm Zentralh*, 76 (1935), 181 (E V S)

Draconal (Dr R E Muller & Co Berlin Pankow) is a sedative tablet containing 0.23 Gm of diethylbarbituric acid, 0.15 Gm of bromisovalerianylurea, and 0.12 Gm of paraacetphenetidin—*Pharm Zentralh*, 76 (1935) 215 (E V S)

Elixir Alycin (Wm S Merrell Co Cincinnati Ohio) an elixir containing $4\frac{1}{2}$ grains of salicylate and 9 grains of alkali in an elixir base. It is used in conditions where salicylates are indicated, colds, tonsillitis, influenza, neuralgic complaints, rheumatism and arthritis. It is supplied in 4- and 16 ounce bottles—*Drug Circ*, 79 (April 1935) 30 (T G W)

Erinol (Pfau Apotheke Th Thurn Mainz) an inhalant for colds and throat catarrh is composed of refined camphor, mentho, vanilla oil and purified paraffin oil—*Pharm Zentralh*, 76 (1935), 181 (E V S)

Esmodil (Bayer, I G Farbenindustrie A G Leverkusen a Rh) an injectable intestinal tonic is a 1 cc ampul containing a 3 parts per million aqueous isotonic solution of trimethylmethoxypropenylammonium bromide. It is used in intestinal atony after laparotomy or other difficult operative interferences, in infectious diseases with peritoneal irritation after childbirth or septic abortions—*Pharm Zentralh*, 76 (1935) 215 (E V S)

Eubion is a vitamin A concentrate issued in the form of chocolate tablets. The vitamin A concentrate has an activity of approximately 10 000 Carr Price units and each tablet is equivalent in vitamin A to one tablespoonful (14.2 cc) of best quality cod liver oil, with a suitable amount of vitamin D. It is claimed to be not only of considerable value to growing children but also a

useful prophylactic against common cold in adults Eubion does not cause gastric disorder, and can be given where cod liver oil cannot be tolerated One or two tablets daily is recommended for children In severe infections in adults, four or five tablets may be given daily Eubion is issued in tins of 24 tablets—*Quart J Pharm Pharmacol*, 8 (1935), 159 (S W G)

Eupragin (Chem Fabrik Aethylia G m b H, Mainz) ampuls contain sodium sulphate (4.8%) and potassium sodium tartrate (1%) It is indicated for muscular rheumatism and lumbago—*Pharm Zentralh*, 76 (1935), 181 (E V S)

Gadoment (L L Patch Co, Boston, Mass) Gadus Ointment (Patch) is a preparation of cod liver oil for the treatment of burns and other skin lesions It is reported by the manufacturer to contain specially treated cod liver oil 70%, phenol 0.375% in a special wax base Marketed in tubes, one pound and five pound containers (S W G)

Gastro-Lymphon (Bineuco G m b H Weisbaden), an intestinal regulator, is composed of Ext Colombo, gentian, juniper, condurango, curcuma, chamomile, peppermint, potassium bromide, potassium bicarbonate, arsenic and formaldehyde—*Pharm Zentralh*, 76 (1935) 181 (E V S)

Gentone (Win S Merrell Co, Cincinnati, Ohio) The green drugs of *verbnum prunifolium*, *passiflora incarnata* and *pulsatilla*, together with colorless hydrastis, in an aromatic cordial Its action is that of a mild sedative, anti spasmodic and analgesic and it is indicated in the treatment of amenorrhea, dysmenorrhea, menorrhagia and during puberty and the climacteric It is supplied in pint bottles—*Drug Circ*, 79 (May 1935), 28 (T G W)

Glucostrophin (Labopharma Dr Laboschin G m b H, Berlin) is marketed in two strengths the weaker containing 20% of glucose and 0.00025 Gm of strophanthin, while the stronger contains 0.0005 Gm of strophanthin—*Pharm Zentralh*, 76 (1935) 105 (E V S)

Glutamiron (Calco Chemical Co Inc, Bound Brook N J) A combination of glutamic acid, ferrous glutamate and ferrous chloride, each tablet containing 75 mg of available iron This material must be given under the care of a physician and continued laboratory work is essential to check the results It is used as a hematinic and gastric stimulant It is supplied in bottles of 100 500 and 1000 tablets—*Drug Circ*, 79 (April 1935), 30 (T G W)

Goebin (Heinr Adolf Goebel Steinhagen in Westf), a preparation of diluted spirits, mucilage of acacia and precipitated sulphur is used for skin eruptions—*Pharm Zentralh*, 76 (1935), 181 (E V S)

Gonococcus Filtrate, Corbus-Ferry (Parke, Davis & Co, Detroit, Mich) is a standardized bouillon filtrate of the gonococcus, containing the soluble specific extracellular toxin, and designed for intradermal injection It is claimed to develop specific active immunity against the gonococcus It is indicated in both acute and chronic cases of gonorrheal infection It is supplied in packages containing a 2 cc vial of filtrate and a 2 cc vial of diluent—*Drug Circ*, 79 (May 1935) 28 (T G W)

Gynergen (Sandoz Chemical Works, Inc Distributors E Fougera & Co, Inc) Ergotamine tartrate in the pure and stable form The ampul solution produces a prolonged tonic uterine contraction and is painless and non-irritant It is employed in obstetrics and gynecology to prevent or control uterine hemorrhage, in the puerperium to favor involution and prevent puerperal complications, in sympathicotomies such as migraine headache to relieve acute seizures It is supplied in 0.5 cc and 1-cc ampuls, 0.001-Gm tablets, and 0.1% solution—*Drug Circ*, 79 (April 1935) 31 (T G W)

Halicaps (Norwich Pharmacal Co, Norwich, N Y) Each capsule contains not less than 3 minims of halibut liver oil, vitamin tested to contain not less than 55 100 units of vitamin A and 767 units of vitamin D per Gm Each capsule is the equivalent in vitamin A of at least four teaspoonfuls of standard cod liver oil and contains not less than 9414 units of vitamin A and not less than 131 units of vitamin D It is indicated in rundown conditions due to a deficiency of vitamin A It is supplied in boxes of 50 capsules—*Drug Circ*, 79 (April 1935) 31 (T G W)

Halmagon is a combination of the halogen salts of magnesium It is supplied as tablets for oral administration, as an emulsion for intramuscular injection and as an isotonic solution for rectal injection Each tablet contains magnesium chloride 0.395 Gm, magnesium bromide 0.0133 Gm, magnesium iodide 0.00067 Gm, magnesium fluoride 0.006 Gm, made up to 0.45 Gm with excipient Each ampul of the emulsion contains in 5 cc approximately 34 grams of halogen salts consisting of chloride 2.137 Gm, bromide 0.58 Gm, iodide 0.00039 Gm, fluoride 0.00028 Gm

The isotonic solution contains in each 100 cc approximately 29 grains of the halogen salts. The formula is magnesium chloride 1.82% bromide 0.04% and fluoride 0.0018% in sterile distilled water. Halmagon preparations are suggested for the correction of general and specific conditions due to a deficient magnesium supply in the diet. They are recommended for the treatment of asthma, lack of tone, hypothyroidism, hypoadrenia and insomnia. One to three tablets dissolved in cold or tepid water are to be taken without food on arising in the morning. A course extending over 2 months is suggested. Intensive dosage can be given by intramuscular injection of the emulsion. It should be injected deeply, and causes no local irritation. For post operative cases and patients confined to bed large doses may be given as halmagon isotonic rectal solution. This is supplied in containers which only need to be attached to a rectal tube. Halmagon tablets are issued in boxes of 4 tubes each containing 15 tablets of 7 grains sufficient for 4 weeks' administration. The emulsion is issued in boxes of six 5 cc ampuls. Halmagon isotonic solution is supplied in 100 cc, 250-cc and 500 cc containers—*Quart J Pharm Pharmacol*, 8 (1935), 159

(S W G)

Heibitten (Apotheker Wagner and Goedike Pharm Fabrik, Salzwedel) are tablets containing caffeine (0.05 Gm) phenacetin (0.15 Gm), amidopyrazolone (0.15 Gm) and antipyrine (0.15 Gm). It is used for grippe, headache, migraine and rheumatism—*Pharm Zentralh* 76 (1935), 181

(E V S)

Hepatrat Ampuls (Nordmark Werke Hamburg) A liver extract, put up in packages of 3 and 10 ampuls containing 3.30 cc—*Pharm Presse* 40 (1935), 104

(M F W D)

Hepatrat Liquid, Sweetened (Nordmark Werke Hamburg) is a liver extract in combination with a sugar solution, put up in 60-, 100 and 500 cc containers—*Pharm Presse*, 40 (1935), 104

(M F W D)

Hovaletten, forte (Chemische Fabrik J. Blaes and Co A G Munchen) is a white tablet exhibiting a sedative and mild hypnotic action similar to Hovaletten Hops and Valerian. The action is intensified due to the addition of 0.01 Gm of phenylethylbarbituric acid and 0.05 Gm of phenacetin per tablet—*Pharm Zentralh* 76 (1935) 105

(E V S)

Hydronal (Bayer, I G Farbenindustrie A G Leverkusen a Rh) a specially prepared aluminum hydroxide in tablet form is used as an antacid against hyperacidity, for gastritis, heartburn, gastric ulcers and gastric pains—*Pharm Zentralh* 76 (1935) 215

(E V S)

Iscapral (Bayer I G Farbenindustrie A G, Leverkusen a Rh) are tablets containing in each 0.06 Gm of prominal, 0.5 Gm of theobromine and 0.075 Gm of potassium iodide triethanolamine. It is used as a spasmolytic and vasoregulator for heart and vascular pains of angina pectoris, arteriosclerosis, etc—*Pharm Zentralh*, 76 (1935) 215

(E V S)

Jocapral (I G Bayer, Elberfeld) is a combination of 0.5 Gm theobromine, 0.06 Gm prominal and 0.075 Gm iodocalciumtriethanolamine in tablet form. It is an antispasmodic and vasoregulator in heart disease and diseases of the blood vessels. It gradually reduces the blood pressure and is therefore employed in angina pectoris, arteriosclerosis, vasoneurosis, etc. It is given in doses of $\frac{1}{2}$ to 1 tablet three times a day—*Pharm Weekblad*, 72 (1935), 568

(E H W)

Katamenol-Dragees (Apogepha Fabrik chem-pharm Preparate Dr. Starke and Max Biering G m b H, Dresden A 19) a tablet containing thyroid, ovarian substance and theobromine, is used for neurasthenia and disturbances of the menopause—*Pharm Zentralh* 76 (1935), 215

(E V S)

Larostidin is a 4% sterile isotonic solution of L-histidine monohydrochloride. It is suggested as reliable and safe for the treatment of gastric and duodenal ulcers. The treatment consists of a daily injection either intramuscular or subcutaneous of one 5 cc ampul of larostidin for a period of 3 weeks. After 4 to 5 injections, pain disappears, nausea, vomiting and hyperacidity are relieved and after 10 days a normal diet becomes permissible. It is claimed that 70% to 80% of the cases treated gave good results. Larostidin is supplied in boxes of 6 and 25 ampuls of 5 cc—*Quart J Pharm Pharmacol*, 8 (1935), 160

(S W G)

Leciminz (C. G. Stettner, München) pastilles are composed of refined sugar (97 parts) lecithin (2.5 parts) peppermint oil, spearmint oil, ginger oil, starch and tragacanth. They are used to strengthen the nervous system—*Pharm Zentralh* 76 (1935) 181

(E V S)

Ludozan (Schering Corporation, Bloomfield, N J) is synthetic aluminum sodium silicate containing about 12% of sodium silicate. The product is also made under the name of "Ludozan with Belladonna" and contains 0.5% extract of belladonna. It is used as an antacid and in gastric

or duodenal ulceration It is supplied in cans containing 21 individual prescription envelopes of $\frac{1}{10}$ of an ounce each —*Drug Circ*, 79 (May 1935), 29 (T G W)

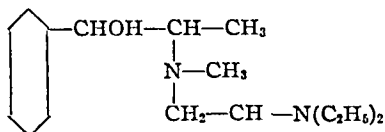
Luemed-Tablets (Dr R C Muller & Co, Berlin Pankow), an antisyphilitic, are effervescent tablets containing potassium dichromate (0.06 Gm), potassium nitrate and magnesium superoxide —*Pharm Zentralh*, 76 (1935), 215 (E V S)

Maltine with Spleenmarrow and Iron (Maltine Co, New York, N Y) Each fluidounce contains spleenmarrow concentrate, 10 minims, iron and ammonium citrate, 10 grains, copper, trace, maltine (fortified with a cod liver oil concentrate), *q s*, containing vitamins A, B, D and G It is indicated in the treatment of anemia and general debility It is supplied in 12 ounce bottles —*Drug Circ*, 79 (May 1935), 29 (T G W)

Neiso-Lysate (Eli Lilly & Co, Indianapolis, Ind) is a solution of gonococcus proteins which have been put into solution by the action of bacteriophage It is used for the treatment of gonorrheal infections and is supplied in 5 cc and 20 cc rubber stoppered vials —*Drug Circ*, 79 (May 1935), 28 (T G W)

New Remedies A review of new remedies for 1934 in which the important factors discussed are chemical structure, physiological properties and recent changes in nomenclature The following are the items reviewed

Isalon (Wiernik u Co, Berlin) is 1-phenyl-2 (methyl [diethyl aminoethyl]—aminopropane

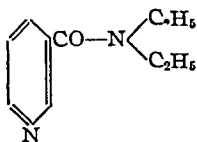


1-ol It is said to be one-half as toxic as ephedrine and free from side actions

Dermarodol (Rosenberg, Freiburg Br) is a depressor drug, supposedly the sulphocyanate derivative of acetyl trimethylcolamine or a mixture of some sulphocyanate with acetylcholine

Dyocid (Schumann, Berlin Neuköln) is a mixture of theobromine calcium salicylate and digitalis leaves, containing also rubidium iodide It is to be used in cardiac and vascular conditions

Eurocan (Interpharma G m b H, Prag) is a 25 per cent solution of pyridine β carboxylic acid diethylamide,



recommended for respiratory and circulatory disorders

Spascul and Astmocut (Dr Lutze u Co, Berlin) are ointments of pituitary extract made from a base of wool fat into which has been incorporated 10 per cent of alcohol

Emphysemon (Ysatfabrik, Wernigerode) is a protein-free extract of kidney parenchyma, to be given intra muscularly or subcutaneous in bronchial asthma and emphysema To it is attributed a specific action on the reticulo endothelium of the lungs and bronchi

Pelein (Schering-Kahlbaum) is a bacterial vaccine originating from 60 different organisms and used against whooping cough

Hellisen (I G) is a mixed pollen extract representing 16 common European plants, used for the treatment of hay fever

Expectal (Koln Mulheim) is an expectorant, containing potassium sulphoguaiacolate, extract of thyme and dipropylbarbituric acid codeine

Larostidin (Hoffman-La Roche) is an isotonic solution of L-histidine hydrochloride for intramuscular or subcutaneous injection in the treatment of gastro intestinal ulcers

Citro pepsin (Promonta-Werke, Hamburg) is a combination of pepsin and citric acid in the form of tablets One tablet converts 10 Gm of albumin to peptones and albumoses within three hours

Mucitekt (Nordmark-Werken, Hamburg) is a mixture of mucin, vegetable proteins and protein constituents of the blood, used in the treatment of hyperacidity, heartburn and ulcers

Enzynorm (Nordmark Werken, Hamburg) is a biological preparation, stabilized with hydrochloric acid, said to represent the total stomach enzymes

Enterofagos (Laboratoriums für medizinische Chemie und angewandte Biologie Berlin Greenwald) is presumably a mixture of polyvalent bacteriophages. It is intended for use against intestinal infections

Alloton (J D Riedel de Haen, Berlin) is a combination of volatile oil from garlic with desoxychoic acid, in crystalline form, which is stable in the stomach, but decomposed by the alkaline intestinal juice. It is recommended for the treatment of arterio sclerosis and as an anthelmintic and intestinal antispetic

Oxyaskarin (Dr Brandt u Co, Halle) is an anthelmintic the active constituent of which is aluminum santoninate

Varicocid (Gehe u Co, Dresden) is an aqueous solution of the sodium salts of certain highly unsaturated fatty acids found in cod liver oil intended for hypodermic use in the treatment of hemangiomas and hemorrhoids

Proviron and *Androfort* (Schering) are preparations containing the male sex hormone, isolated recently by Butenandt

Proluton (Schering-Kahlbaum), *Lutren* (I G) and *Progestin* (Degewop) are preparations of the corpus luteum hormone

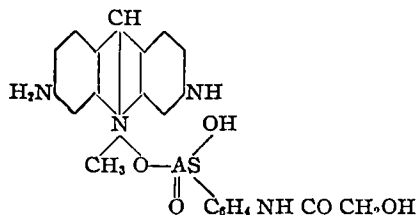
Uterstonon (Promonta) is a glandular product made from the uterus of mature cattle

Oestruzyl (Deutsche Gesellschaft für Pharmazie und Kosmetik, Berlin) is a form of combined ovarian and follicular hormones, said to be active when given orally

Profecundin (A Richter Budapest) is a preparation of vitamin E for the prevention of habitual abortion

Nafisal Ovula (Zimmer u Co, Frankfurt a M) The ovula contain octylhydrocupreicme hydrochloride and are used to combat the ichor of uterine cancer

Flavadin (Curta, Berlin-Britz) is designated as a mixture of 3,6-diamino-10-methylacridinium glycolyl aminophenylarsinic acid

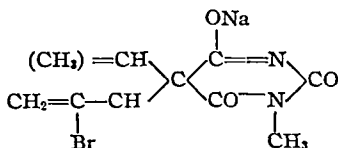


and Trypaflavine. It is used in the treatment of cervical gonorrhea of women

Sigmagan (Max Queisner, Charlottenburg) is a urological remedy alleged to have the formula $C_{228}H_{227}O_{77}Na_{76}Ag$ with a molecular weight of 8969, corresponding to a silver content of 1.2 per cent. The formula appears to be in error

Profundol (Promonta) is described as a three phase hypnotic employing for the first phase bromdiethylacetylcarbamide citrate, for the second phase allyl sec butyl barbituric acid for the third phase, the same barbiturate mixed with designated fatty acids to inhibit absorption in the stomach

Eumarcon (J D Riedel de Haen) is a 10 per cent solution of the sodium salt of isopropyl β bromo allyl-N methyl barbituric acid, having the formula



In structure, this hypnotic is closely related to Evipan sodium. It is said to offer a wide margin of therapeutic safety and to induce sleep lasting from twenty-five minutes to two hours.

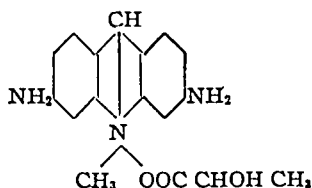
Rectidon (J. D. Riedel de Haen) is the sodium salt of β bromo allyl sec amyl barbituric acid, intended for rectal administration as a hypnotic.

Alloform (Curta, Berlin) is a preparation of aluminum containing 45 per cent of water-soluble aluminum oxide. With water it affords a stable colloidal dispersion which may be used in place of aluminum acetate solutions. It is prepared by the action of ethylene oxide on a solution of aluminum chloride.

Katalyn Silber (Schering Kahlbaum) is a colloidal form of silver, adsorbed on a ceramic powder, recommended for angina.

Simant (Verbandstoffindustrie A. G., Berlin) is said to contain silver manganite to which is assigned the formula $\text{Ag}_2\text{O} \cdot 2\text{MnO}_2$. It is supposedly unaffected by albumin and hydrogen sulphide and is marketed in the form of solution ointments and bandages.

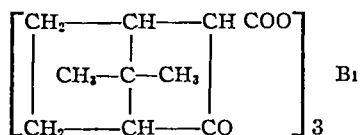
Argoflavin (I. G.) is a complex silver salt of 3,6 diamino 10 methylacridinium lactate, containing 20 per cent of silver. It is usually given intravenously for different forms of septic infection. The argoflavin component has the formula



Dulcargan (Dr. Winzer, Walldorf bei Frankfurt) is silver tetraborate $\text{Ag}_2\text{B}_4\text{O}_6$ containing 58.1 per cent silver. Being non irritant it is recommended for infections of the eye.

Neo Olesan (I. G.) is a 10 per cent solution in oil of the bismuth salt of dimethyl endomethylene hexahydrobenzoic acid $(\text{C}_{10}\text{H}_{16}\text{O})\text{Bi}$. It may be injected without pain in all stages of syphilis.

Lectbis (Dr. R. und Dr. O. Weil, Frankfurt) is the oil soluble bismuth salt of tricamphocarboxylic acid, stabilized by means of lecithin. Its formula is given as



It is intended for intramuscular administration.

Bismutrol (Nordmarkwerke) is described as a bismuth salt stabilized by means of liver colloids. It is said to be effective as an antiluetic when given orally.

Omnival (Ifah, Hamburg) is a polyvalent vaccine, representing coli streptococci, staphylococci and gonococci, suitable for intravenous injection against gonorrhea, syphilis, etc.

Citrosulf (Nordmarkwerke, Hamburg) is a molecular compound of pyramidon and quinethiosulphate, containing also calcium, phosphorus and pentose nucleotide. It is to be used as an antipyretic.

Saridon (Hoffman La Roche) is an antipyretic containing phenacetin, allylisopropylurea, sedormid, caffeine and isopropylantipyrene.

Calmuran Salbe (Dr. Truttwein, Dresden) is a dermatological ointment containing 9 per cent of uranium and 7 per cent of bromine.

Dermazym (J. Blaes and Co., München) is a form of freshly prepared brewer's yeast without added preservative. It combines with water-soluble medicinal agents and may be emulsified with 50 per cent of fats and with tar or balsam.

Vulnovitan (Gedeon Richter, Budapest) is a solution of vitamin A in sterile paraffin oil or an ointment thereof for application to infected and post operative wounds or other purulent skin disorders.

Antipiol-Salbe (Laboratorium für medizinische Chemie und angewandte Biologie, Berlin) is a sterile, polyvalent, immunizing bacterial filtrate representing staphylococci, streptococci and pyocyanous

Aldifen (Biochemischen Laboratoriums, Locarno) is dinitrophenol in the form of dragees

Pernaemyl and *Pernaemyl forte* (Degewop) are protein free liver extracts intended for parenteral injection

Cabion (Merck) Cantantabletten (I G) and Redoxontabletten (Hoffmann-La Roche) are tablets of ascorbic acid (vitamin C)

Chromoson (Curta Berlin) is a solution of methylene blue-glucose, to be given intravenously in doses of 10 to 20 cc in cases of carbon monoxide and cyanide poisoning—*C A ROJAHN Arch Pharm* 273 (1935), 177 (L L M)

Noctusan (Homoopathische Centralapotheke gegr von Prof Dr Mauch, Goppingen) is prepared from tinctures and homeopathic dilutions of oats passiflora, chamomile coffee pulsatilla nux vomica, ignatia and cypripedium It is used as a soporific and nerve anodyne—*Pharm Zentrallh* 76 (1935) 215 (E V S)

Octinum-Suppositories (Fa Knoll A G, Ludwigshafen) contains in each 0.25 Gm *Octinum oleum* and cocoa butter, put up in packages of 5—*Pharm Presse*, 40 (1935) 105 (M F W D)

Pankresaletten (Dr Richard Weiss, Berlin) contain the hormone found in the pancreas with the carbonic acid salt of dekamethylenediguandine The carbonic acid salt is soluble with difficulty in the gastric juice but is easily soluble in the intestinal fluid This condition prevents digestive disturbances *Pankresaletten* serve in the oral treatment of diabetes—*Pharm Weekblad*, 72 (1935), 568 (E H W)

Paradies-Salbe (Hof Apotheke Baumer & Lang, Erlangen) is an ointment containing menthol methyl salicylate salicylic acid, chloroform arnica *Rhus toxicodendron*, belladonna and hyoscyamus It is used for muscular and articular aches, gout and rheumatism—*Pharm Zentrallh* 76 (1935) 216 (E V S)

Pavervysatum-Burger (J Burger Wernigerode) is prepared from *Fruct Papaveris immaturus*, sold in 15-cc vials—*Pharm Presse*, 40 (1935) 105 (M F W D)

Pentnucleotide (formerly known as nucleotide K 96) is a solution of the sodium salts of pentose nucleotides prepared for intramuscular use It is apparently a stable material, but should be stored away from light at room temperature The preparation should not be used if it shows a precipitate or turbidity It is recommended for treatment of agranulocytic angina infections with leucopenia benzol poisoning and infectious conditions such as pneumonia which are rendered more grave by a complicating leucopenia The dose is one vial (10 cc) injected intramuscularly twice a day until the white blood cell count has been normal for at least 3 days In desperate cases 20 cc may be injected twice daily for 4 days If reactions occur it may be administered in divided doses intramuscularly the site being previously anesthetized with novocaine and adrenaline—*Quart J Pharm Pharmacol*, 8 (1935) 160 (S W G)

Peroxaan (Naarden Chemical Factory) is a 10% (by volume) solution of hydrogen peroxide appearing on the market under this name in bottles of 55 cc capacity—*Pharm Weekblad*, 72 (1935), 568 (E H W)

Phenochan Salve (Pharma" G m b H Aussig) contains 10% glycerinate phenylchonic, phenyl salicylate menthol etc, packaged in tins and tubes containing 30 Gm—*Pharm Presse*, 40 (1935), 104 (M F W D)

Proliferol (Ulmer Pharmacal Co Minneapolis Minn) A solution of tannic acid thy mol and benzyl alcohol in an alcoholic distillate produced from a combination of tinctures of organic drugs It stimulates the development of fibrous tissue cells and is used in the injection treatment of hernia It is supplied in 60 cc rubber capped vials—*Drug Circ* 79 (April 1935) 30 (T G W)

Proplasma-Hautsalbe (Chem pharm Institut Schuren, Berlin Friedenan) contains in an easily absorbable ointment base, precipitated sulphur camphor bismuth subnitrate zinc oxide lanolin glycerin, liquid paraffin—*Pharm Zentrallh*, 76 (1935) 216 (E V S)

Psorimed (Chem Fabrik Dr Aug Wolff Bielefeld) an amber colored liniment, contains in a fat free mixture coal tar, elementary sulphur, salicylic acid and dioxyanthranol It occurs in two strengths, and is used for scaly skin eruptions—*Pharm Zentrallh*, 76 (1935) 106 (E V S)

Pyrethrum Ointment (Upshur Smith Co., Minneapolis, Minn.) is prepared from *Pyrethrum* (*chrysanthemum*) *cinerariæfolium* or other species and an absorbent fatty base. One hundred Gm of ointment contains 0.75% pyrethrins. Its use in scabies has proved to be as effective as sulphur without causing irritation or dermatitis. It is supplied in amber jars containing 100 Gm.—*Drug Circ.*, 79 (May 1935), 28 (T G W)

Resyl (Ciba Company, Inc., New York, N. Y.) A glycerol guaiacal preparation in syrupy form containing 0.08 Gm of guaiacal per dram. It is used as a non-irritating expectorant and antiseptic, in cases of laryngitis, bronchitis and other pulmonary affections. It is supplied in 4-oz bottles.—*Drug Circ.*, 79 (April 1935), 30 (T G W)

Rogerma (Laboratoires du Rogerma, M. Mahieu, Lens) is an antiseptic liquid for wound treatment containing 20 Gm of sodium tetraborate, 4 Gm of dioxybenzol, 20 Gm of boric acid, 1 Gm of salicylic acid, 0.1 Gm para isopropenylmetacresol, 0.33 Gm *Erythroxylon Coca* and 5 Gm of plant extractive.—*Pharm. Weekblad*, 72 (1935), 568 (E H W)

Sagradol contains mineral oil and cascara sagrada in the form of a fine emulsion. It also contains aromatics but no sugar, alcohol, narcotics or phenolphthalein. Sagradol is offered as a regulative tonic laxative suitable for the treatment of chronic constipation and associated disorders. For adults the dose is a dessertspoonful twice to four times daily, the dose for children is smaller according to age. Sagradol is supplied in bottles of 7 and 15 fluidounces.—*Quart. J. Pharm. Pharmacol.*, 8 (1935), 160 (S W G)

Sedozym (Chem. Fabrik J. Blaes and Co. A. G., München) is a dried granular yeast preparation containing 50% of bromides as the sodium and potassium salts. It is used as a sedative.—*Pharm. Zentralh.* 76 (1935) 106 (E V S)

Sodium Formaldehyde Sulphoxylate (Winthrop Chemical Co., Inc., New York, N. Y.) A powerful reducing agent and is indicated in the treatment of mercurial poisoning. It is supplied in boxes of two 10 Gm ampuls.—*Drug Circ.*, 79 (May 1935), 28 (T G W)

Specialties—Newly Registered There are listed 85 pharmaceutical specialties registered in the months of March and April 1935, giving the manufacturer and agent, forms in which they are sold and a brief statement of their composition.—*Pharm. Presse*, 40 (1935) 175 (M F W D)

Staphylococcus Toxoid Immunization with staphylococcus toxoid has been used recently as a combined method of prophylaxis against and treatment of, chronic infections. Two preparations are issued: staphylococcus toxoid A—for active immunization ($1/10$ dilution) and staphylococcus B—for active immunization (undiluted toxoid) each in 1 cc containers.—*Quart. J. Pharm. Pharmacol.* 8 (1935) 160 (S W G)

Stomachysatum-Bürger (J. Bürger, Wernigerode) is a preparation made from *Artemisia absinthii*, *Achillea millefol.*, *Guaphal. aren.*, *Rheum palmat.*, sold in 15 cc vials.—*Pharm. Presse*, 40 (1935), 105 (M F W D)

Syncor-Suppositories (Ta. Syngala, G. m. b. H., Vienna, 16th dist.) contain Syncor fluid (equivalent to 0.10 Gm digitalis leaves) and cocoa butter, put up in packages of 5 and 10.—*Pharm. Presse* 40 (1935) 105 (M F W D)

Theobromine-Calcium Calcium Salicylate Pills (Dr. Kronik and Ph. Mr. Edels, Vienna, 7th dist.) Each contains 0.50 Gm theobromine calcium calcium salicylate, 10 to a package.—*Pharm. Presse* 40 (1935) 105 (M F W D)

Tussedat Drops are prepared in two strengths. The simple cough-drops contain extract of *Castanea vesca*, *drosera*, *primula* and *thyme*, benzoic acid, bromides and ephedrine (0.35%). The stronger form contains the same ingredients except that the ephedrine is substituted by 0.8% ethylmorphine. The indications are all cough causing afflictions of the respiratory organs and the dose is 25 drops 3 or 4 times a day in water.—*Pharm. Ztg.*, 80 (1935) 381 (G E C)

Typhoral, Lilly (Eli Lilly & Co., Indianapolis, Ind.) Each pulvule contains 10 billion heat-killed typhoid bacilli, triturated with a matrix of starch. It is used as an oral immunization against typhoid fever. Three pulvules constitute a complete immunization, a pulvule containing $1\frac{1}{2}$ gr of ox bile is given with the first dose. The time for the appearance of antibodies is 4 to 6 weeks after the completion of the course. The treatment should be repeated in the spring of each year. It is supplied in a single immunization package containing 3 red pulvules and 1 green pulvule (ox bile) and in boxes of 10 immunization packages.—*Drug Circ.*, 79 (April 1935) 31 (T G W)

Uroselectan-B-Ampuls (Schering-Kahlbaum A G, Berlin) contain 1.75 Gm of the sodium salt of *N*-methylthiodocheilic acid in 5 cc, one 5 cc ampul to the package—*Pharm Presse*, 40 (1935), 105 (M F W D)

Vaginal Catarrh Powder-Twega (Twega, G m b H, Vienna, 3rd dist) contains boric acid zinc sulphate, lycopodium and pyoktanin, put up in packages of 10 Gm—*Pharm Presse* 40 (1935), 105 (M F W D)

Vionase tablets contain in each, dried yeast 2.5 grains, exsiccated ferrous sulphate 273 grains, manganese hypophosphite, 0.03 grains, copper sulphate 0.03 grains, with excipient. It is indicated for the treatment of anemia, neurasthenia, debility in pregnancy and lactation and as an adjuvant to liver therapy. The dose is one tablet three times a day. Vionase tablets are supplied in bottles of 30, 100 and 500—*Quart J Pharm Pharmacol*, 8 (1935) 160 (S W G)

Vitamin Capsules, "Maltine" (The Maltine Co, New York, N Y) are capsules containing halibut liver oil standardized with other fish liver oil, with added natural vitamin D and dicalcium phosphate. The latter is an efficient reinforcement of halibut liver oil. Each capsule contains not less than 9414 vitamin A units—942 vitamin D units and is equivalent in vitamin A and D content to not less than three teaspoonfuls of cod liver oil. Each capsule contains 2 grains of dicalcium phosphate. It is indicated in dietary deficiency, particularly as regards vitamins A and D and calcium and phosphorus. It is supplied in boxes of 30 four-minum capsules—*Drug Circ*, 79 (April 1935) 31 (T G W)

Weiche Wiener Eisenpillen (Hof Apotheke Baumer & Lang Erlangen) are pills containing a reduced iron activated with organic copper. It is used for anemias—*Pharm Zentralh*, 76 (1935) 181 (E V S)

BACTERIOLOGY

Antumenogococcal Serum—A Method for Titrating the Protective Action of Mice were infected by the use of a 6% mucin suspension buffered at pH 7.4. Cultures grown on 10% rabbit's blood pneumococcus agar for 14 to 18 hours were made up to a standard of 2 billions per cc. Dilutions with mucin were injected intraperitoneally into suitable strains. For test of antibodies a dilution of the serum was injected 30 minutes previously. Tests on unselected mice are not satisfactory—GEOFFREY RAKE *Proc Soc Exptl Biol Med*, 32 (1935) 1175 (A E M)

Antistreptococcal Serum The evidence obtained in puerperal fever causes suggests that such administration may sometimes have an unfavorable effect upon puerperal infections by hemolytic streptococci, and this impression is to some extent supported by the evidence of animal experiments. Although sera have been produced which would protect animals against infection by streptococci of artificially enhanced virulence, there is no satisfactory evidence that a serum has ever been produced which would afford more than very slight protection against hemolytic streptococci freshly isolated from acute human infections. Similarly there is no evidence that any antistreptococcal serum has ever exerted a curative effect in animals infected by such hemolytic streptococci freshly isolated from human infections. Until our knowledge of immunization against the hemolytic streptococci has progressed further it would seem desirable to discontinue the use of antistreptococcal sera in the treatment of puerperal fever and "surgical sepsis"—L COLEBROOK *Lancet* 228 (1935), 1085 (W H H)

Antityphoid Sera—Virulence Tests for Typhoid Bacilli and Antibody Relationships in Intracerebral injection of mice with typhoid bacilli combined with intraperitoneal injection of antisera is suggested for measuring the protective value of sera against typhoid bacilli and also for testing the relative virulence of typhoid bacilli strains—J NORTON and J DINGLE *Am J Pub Health* 25 (1935), 609 (A H B)

Bacteria in Water Samples—Effect of Temperature of Storage on The number of viable organisms present in water after storage for 48 hours at 0–7° changes only slightly. The ability to ferment lactose is not inhibited at low temperatures—FRED W TANNER and DORIS L SCHNEIDER *Proc Soc Exptl Biol Med* 32 (1935) 960 (A E M)

Bacteriophage—Nature of Formalin Inactivation of A staphylococcus bacteriophage was inactivated by 0.018% of formaldehyde. Diluting with 20–100 parts of water releases the bacteriophage again at a pH of 6 to 6.6 and 37°. The reactivation is completed only after 10 to 15 days—E W SCHULTZ and L P GEBHARDT *Proc Soc Exptl Biol Med* 32 (1935) 1111 (A E M)

Brilliant Green Value of, as a Local Antiseptic Even in dilutions of 1-200 000, brilliant green inhibits the growth of *Streptococcus viridans* and pneumococci. A 1% solution is used on the external skin and a 0.5% solution on the mucous membranes and for infants—J K NARAT *Zentralbl. Chir.* (1934), 49, through *Deut. Med. Wochschr.*, 61 (1935), 72 (H R)

Brucellosis—Studies of Correlated Human and Bovine Investigation indicates that the ingestion of raw milk obtained from cows infected with contagious abortion and showing positive tests for agglutinins to *Br. abortus* in their blood is responsible for the development of similar agglutinins in the blood of some consumers. The disease manifestations are comparatively mild—R STORR and EMIL BOGEN *Am. J. Pub. Health* 25 (1935) 580 (A H B)

C Diphtheria—Isolation of Virulent and Highly Toxicogenic Strain of A virulent strain was recently isolated by the authors which is highly toxicogenic even in semi-synthetic medium, and which was comparable in all respects to Park Williams No. 8 strain—GEORGE F LEONARD and AUGUST HOLM *Am. J. Pharm.* 107 (1935), 174 (R F F)

Calcium Chloride Solutions—Effect of Sterilization on Solutions were prepared using calcium chloride crystals of reagent purity and calcium chloride B P which only just complied with the Pharmacopoeia limit of free alkali test. The results indicate that both Tyndallization and heating in an autoclave are suitable methods of sterilizing calcium chloride solutions, but the calcium chloride used must be of a high degree of purity to avoid the formation of deposits of calcium carbonate and other impurities such as compounds of iron and aluminum which may be present in calcium chloride meeting the specifications of the Brit. Phar.—C E COULTHARD and G F HALL *Quart. J. Pharm. Pharmacol.*, 8 (1935), 96-97 (S W G)

Cinchona Alkaloids—Pneumococcal Value of III Apocupreines (Apoquinine) The authors, on demethylation of quinine have obtained two products (possibly geometric isomers) which they have named α - and β -apocupreines. Their dihydrochlorides are said to possess fairly high pneumococcal power *in vitro*, very low toxicity toward mice when compared with quinine, optochine or ethylapocuprine, and have a protective power similar to optochine and ethylapocuprine. The method of preparation and physical constants are given—C L BUTLER and LEONARD H CRETCHER *J. Am. Chem. Soc.*, 57 (1935), 1083 (E B S)

Diphtheria Use of Intradermal Injections of Toxin-Toxoid Mixtures Toxin-toxoid mixture seems to give promise of being a usable Schick test preparation and consists of mixtures containing diphtheria toxin diluted to Schick strength in a diluent containing purified toxoid in various concentrations studied—W C BUNNEY *Am. J. Pub. Health*, 25 (1935), 623 (A H B)

Diphtheria Toxin—Inactivation of, in vivo and in vitro by Crystalline Vitamin C (Ascorbic Acid) Vitamin C inactivates diphtheria toxin and helps to protect guinea pigs against the fatal outcome of diphtheria intoxication. Animals injected with vitamin C are temporarily rendered negative to small doses of the toxin—CLAUS W JUNGBLUT and RAYMUND L ZWEMER *Proc. Soc. Exptl. Biol. Med.*, 32 (1935), 1229 (A E M)

Germicidal Substances IV Hexylresorcinol Comparison of Resistance of Bacteria and Embryonic Tissue The highest dilution inhibiting tissue growth of phenol is 1-840, of hexylresorcinol 1-21,000. The dilutions for inhibition of *Staphylococcus aureus* are 1-65 and 1-7000 respectively. This gives for resorcinol the very favorable toxicity index 3—A J SALLE and A S LAZARUS *Proc. Soc. Exptl. Biol. Med.*, 32 (1935) 1119 (A E M)

Germicidal Substances III Mercurochrome Comparison of the Resistance of Bacteria and Embryonic Tissue to The highest dilution preventing tissue growth was found for phenol 1-840, for mercurochrome 1-10 500. The dilutions for inhibition of bacteria growth were 1-65 and 1-40. This gives a toxicity index of 12.9 for phenol and 262 for mercurochrome. Conclusion: mercurochrome rates low with reference to toxicity and germicidal power—A J SALLE and A S LAZARUS *Proc. Soc. Exptl. Biol. Med.* 32 (1935), 1057 (A E M)

Hemolytic Streptococci in Erysipelas From 52 erysipelas cases sixteen strains of hemolytic streptococci of the beta type were isolated. The results are indicative of a low protective value of erysipelas serum as it is now being prepared. Anti-scarlatinal heterogeneous serum gave greater protection than our erysipelas antiserum against the post-scarlet erysipelas strain E 111 and the strain E 109, a primary erysipelas strain—S SPICER, M F GONSHOREK and E L SPICER *J. Immunol.*, 28 (1935) 410 (A H B)

Injection of Bismuth B P—Note on the Sterilization of The author finds that injection of

bismuth can be sterilized by the autoclave process without previous sterilization of the various components of the preparation Tyndallization is not as reliable —C E COULTHARD *Quart J Pharm Pharmacol*, 8 (1935), 98-99 (S W G)

Insecticides and Fungicides The menace to public health of spray residues of lead, arsenic, fluorine and other inorganic materials on fruits and vegetables demands that insecticides of the future be organic materials, which are more toxic to insects and less toxic to mammals than are inorganic materials Such insecticides will be extracted from plants or synthesized from compounds derived from natural gas petroleum, shale oil, coal or plant products These synthetic compounds need not be so complex in structure as nicotine, rotenone and the pyrethrins for many easily made products of relatively simple constitution possess high insecticidal value Pharmacological testing of new products must accompany their insecticidal testing in order that the use of those poisonous to man and domestic animals may be avoided The field for research is immense and largely untouched —R C ROARK *Ind Eng Chem*, 27 (1935), 530 (E G V)

Measles Serum—Use of Convalescent, to Control Measles in Preparatory School In threatened outbreaks of measles convalescent measles serum in 10 cc doses with a passive immunity of from 2-5 weeks is considered a satisfactory prophylaxis —J GALLAGHER *Am J Pub Health*, 25 (1935), 595 (A H B)

Meningococcus Cultures—Viability and Virulence of Frozen and Dried. Frozen and dried strains of meningococci retain their viability for many months Virulence is preserved for at least 6 weeks —GEOFFREY RAKE *Proc Soc Exptl Biol Med* 32 (1935), 975 (A E M)

Mercurials—Some Organic The authors have studied the bacteriostatic action of 21 organic mercurials in which the mercury is linked to carbon They found the mercury derivatives of more complex structure to be less effective than the mercury derivatives of hydrocarbons and phenols The four most effective in order of decreasing activity were *o* hydroxyphenylmercuric chloride, phenylmercuric nitrate, phenylmercuric acetate and phenylmercuric lactate *Staph aureus* was used The methods of preparation of mercurials are given or referred to —MERRILL C HART and HANS P ANDERSON *J Am Chem Soc*, 57 (1935) 1059 (E B S)

Poliomyelitis—Convalescent Serum in The pathogenesis of poliomyelitis, as a disease transmitted by nerve fibres and entirely neurotropic suggests the ineffectiveness of serum therapy because the antibody can never reach the virus in the central nervous system, therefore the likelihood of success with a serum is slight —M BRODIE *J Immunol* 28 (1935) 360 (A H B)

Preservatives—Notes on Some New, used in Pharmacy The author had occasion to try the methyl and propyl esters of parahydroxy benzoic acid as preservatives for a solution of tartaric acid and an infusion of Calumba The author concluded that a 1% W/V solution of tartaric acid in water may be preserved by the addition of 0.05% methylparahydroxybenzoate, or 0.01% of propylparahydroxybenzoate The Fresh Infusion of Calumba is preserved for four days by 0.15% methylparahydroxybenzoate, the propyl ester having practically no preservative effect The addition of 10% v/v of alcohol (90%) efficiently preserved Fresh Infusion of Calumba —E E NYE *Australasian J Pharm*, 16 (1935) 183 (T G W)

Prontosil—Bactericidal Value of Prontosil displayed streptococcicidal action in infected mice when given subcutaneously or perorally in concentrations up to 4% As a rule 0.02-0.1 of the tolerated dose sufficed to cure the infection while in some cases 0.002-0.01 of the tolerated dose prolonged life A good effect was also observed in chronic streptococcal infections in rabbits with swelling of the joints While not as regular and sure in its effect on staphylococci as on streptococci, this dye was capable of curing rabbits with staphylococcal infections when given intravenously, subcutaneously and orally every day There was no effect on pneumococcal or other bacterial infections The non toxicity of the drug was indicated by the fact that perorally, mice tolerated at least 500 mg per Kg without any symptoms, rabbits at least 500 mg per Kg and cats at least 200 mg per Kg Subcutaneously mice tolerated 1-2 cc of 0.25% solution or 1-2 cc of a 4% suspension of the dye per 20 Gm Rabbits could be given at least 10 cc of a 0.25% solution intravenously or subcutaneously daily for at least 14 days without any deleterious changes in the blood or urine The dye is excreted in the urine which is colored red or reddish yellow about ½ hour after peroral administration —GERHARD DOMAGK *Deut Med Wochschr*, 61 (1935), 250-253 (H R)

Psittacosis—Recent Studies on The intraperitoneal injection of mice with the suspected

material constitutes the best and safest procedure to demonstrate the presence of the virus. Material from 6 human cases showed that the lungs invariably contained the infective agent in such concentrations that the mice succumbed in from 6 to 8 days with typical lesions. The majority of psittacosis infections have occurred in people of middle age. The lower susceptibility of children is well known. California will restrict the sale and distribution to lots of parakeets which have been sampled and tested in the laboratory.—K. F. MEYER, B. EDDIE and I. M. STEVENS. *Am J Pub Health*, 25 (1935), 571 (A. H. B.)

Psittacosis Virus—Growth and Development of, in Tissue Cultures In these experiments the virus was obtained from 1930 infected parrots, and the virulence maintained by passage through mice. Tissue cultures in mice spleens and tissues from chicken embryos were used successfully, and also a fluid medium containing two parts of chicken plasma, three parts of chicken embryo extract and the fluid expressed from the broken clot diluted with an equal amount of saline solution. Stained by Giemsa's stain, the virus colonies were photographed and seen to undergo five cyclogenic phases: (1) The unidentifiable, (2) Homogeneous plaques, (3) Phase of large forms, (4) Phase of intermediate forms, (5) Phase of elementary bodies. This development phase cycle of variants starts in eight hour cultures and ends at forty eight hours of growth. Occasionally motile colonies of the virus have been observed. The virus infects both epithelial cells and fibroblasts.—J. O. W. BLAND and R. G. CANTI. *J Path Bact (Brit)*, 40 (1935), 231 (A. H. B.)

Staphylococcus Toxins and Antitoxins By hemolytic titrations and intracutaneous testing it was determined that certain strains of staphylococcus produce two toxins for which there are corresponding antibodies, namely, Alpha Beta antitoxins demonstrable in immunized horse serum.—A. T. GLENNY and MURIEL F. STEVENS. *J Path Bact (Brit)*, 40 (1935), 201 (A. H. B.)

Sterilization by Dry Heat at 150° C with Special Reference to Oils The work reported confirms the bactericidal efficiency of the Brit. Phar. process for dry heat sterilization. The necessity of taking the temperature of oils by immersion of the thermometer in oil is stressed. The heating caused loss of color in the oils, but no significant deterioration was noted.—C. E. COULTHARD. *Quart J Pharm Pharmacol*, 8 (1935), 90–93 (S. W. G.)

Sterilization of Oils—Note on Results of experiments are noted. The following conclusions have been stated: 1. Even grossly contaminated oils are sterilized by heating at 150° C for one hour, it is probable that heating at 140° C for one hour under reasonable clean conditions of working in a pharmacy, would ensure sterility. 2. The prescribed method of Tyndallization may fail to sterilize contaminated oils.—R. A. O'BRIEN and H. J. PARISH. *Quart J Pharm Pharmacol* 8 (1935), 94–95 (S. W. G.)

Vitamin C and Diphtheria Toxin Vitamin C increased the resistance of guinea pigs to injections of diphtheria toxin. Mixtures of vitamin C and toxin kept in contact for one hour showed decreased toxicity. Such injections do not cause immunization.—CHARLES K. GREENWALD and E. HARDE. *Proc Soc Exptl Biol Med*, 32 (1935) 1157 (A. E. M.)

BOTANY

Camphor—Maximum Yield of, Obtained from *Laurus Camphora* Autumn is the most favorable season to collect leaves of *Laurus Camphora* because they contain at this time the most camphor.—A. ONISCHTCHENKO and A. CHOMENKO. *Soujet-Pharmaz Russ. Savjetskaja Pharmacia*, 5 Nr 6 (1934) 39–42. *Abchas. Zonale station Wilar*, through *Chem Zentr* 106 (1935), 923 (G. B.)

Eucalyptus—Physiological Forms of, as Determined by the Chemical Composition of Essential Oils and Their Influence on Botanical Nomenclature The occurrence of physiological forms in the Eucalypts is of considerable economic importance. *Eucalyptus dives*, the broad leaf peppermint, contains from 40% to 50% piperitone. In some cases the piperitone content fell far below this value, some yielding only 8% and 10% of the ketone. An observation was made of two trees growing together indistinguishable by a botanist, but each containing a different essential oil. A peppermint odor typical of *Eucalyptus dives*, was yielded by one, while in the other, an odor of cineol and terpineol was detected. It was therefore apparent that several varieties or forms of *Eucalyptus dives* existed distinguishable only by chemical means. About the same time a similar case was noticed with *Cinnamomum camphora*. The same behavior was noticed with

Eucalyptus radiata and *Eucalyptus micrantha* It is evident that the discovery of these physiological forms is going to bring about a revolutionary change in the botanical nomenclature of the Eucalypts Over 400 species have been recorded and in view of the physiological forms which have already been observed the question arises whether the actual number of species is likely to exceed 100 —A R PENFOLD *Australasian J Pharm* 16 (1935), 168 (T G W)

Nicotiana Rustica—Harvesting Time for The highest nicotine content (up to 4.93%) was found in overripe *Nicotiana rustica*, in spite of the infection frequently observed with this kind of tobacco on ripening —S KAMSKII *Tabachnaya Prom* (1934), 26, through *Chem Abstr*, 29 (1935) 3109

Plants—The Growth-Promoting and Growth-Arresting Action of Pigments on Certain pigments exercise a great influence on the vegetative growth of plants Given pigments especially if fluorescent may either retard or promote growth, depending upon the concentrations at which they are applied The cause of this phenomenon is related to the photodynamic action of the pigment, and is independent of the soil salts —J SELLEI *Arch Pharm* 273 (1935), 285 (L L M)

Polypodiaceæ of Pharmaceutical Interest—Anatomical Investigation of the Leaves of The following are the drugs considered *Aspidium filix mas* (L) Sw, *A. lobatum* Sw or *A. aculeatum* Doll *A. spinulosum* subsp. *dilatatum* Lam, *Athyrium filix femina* Roth *Scolopendrium* Sm, *Blechnum spicant* With *Polypodium vulgare* L, *Pteridium aquilinum* Kuhn *Asplenium ruta muraria* L *Asplenium trichomanes* L *Asplenium ceterach* L, and *Adiantum capillus veneris* L Photographs and illustrations together with a key for differentiating the species are given —E BRAUN *Arch Pharm*, 273 (1935) 201 (L L M)

CHEMISTRY

GENERAL AND PHYSICAL

Acacia Solutions—Physicochemical Studies on III Osmotic Pressures of Solutions of Arabic Acid and Sodium Arabate A method is outlined by which accurate osmotic pressure concentration relationships may be obtained for systems containing a colloid as the non diffusible component In the case of solutions containing arabic acid and sodium arabate the equilibrium distribution of water and diffusible ions across the membrane was found independent of the size of pore and of the material of the membrane The calculated osmotic pressure was consistently greater than the observed equilibrium pressure the difference bearing a definite relationship to certain other variables in the system —D R BRIGGS *J Phys Chem* 38 (1935) 1145, through *Squibb Abstract Bull* 8 (1935) A-494

Atomic Weights—Committee on—Fifth Report of, of the International Union of Chemistry The report covers the period September 30 1933 to September 30 1934 Reports on the following atomic weight determinations are given carbon nitrogen sodium calcium krypton columbium, molybdenum iodine cesium, tantalum lead radium protactinium and the rare earths The only change made in the table of atomic weights was columbium (niobium) from 93.3 to 92.91 —G P BAXTER O HONIGSCHMID P LE BEAU and R J MEYER *J Am Chem Soc*, 57 (1935) 787 (E B S)

Denatured Salts—Contribution to the Knowledge and Determination of Denaturants of salts (rock, foundry or sea) allowable by law are mineral oil, iron oxide powdered soap sodium sulphate sodium carbonate uranin crystal ponceau R₆ gut or rennet brine alum and petroleum The choice of the denaturant is dependent upon the purpose of the salt such as sodium carbonate for bath salts sodium sulphate for saponification salts and alum or petroleum for tanning of hides Typical formulæ for the various types of denatured salts are given The detection and determination of the denaturants are carried out according to the usual analytical methods —JOHANNES PRESCHER *Pharm Zentralh* 76 (1935) 157 (E V S)

INORGANIC

Hydrogen Peroxide Hydrogen peroxide was discovered by Thenard in 1818 Many attempts to combine oxygen and hydrogen directly to form hydrogen peroxide have been made using catalysts such as high pressure electrical methods ultraviolet light, etc, but none have given results which are of value commercially A recent development was the use of sodium

peroxide, from sodium made by the electrolysis of common salt, and decomposed by hydrofluoric acid. The persulphuric acid process was the first successful commercial process. The potassium persulphate process consists of electrolyzing an acid solution of ammonium sulphate until it contains from 10 to 15 grains of active oxygen per liter. It is then mixed with potassium bisulphate, and potassium persulphate crystallizes out. This is mixed with a solution of sulphuric acid and heated by steam in a still. Hydrogen peroxide and water distil, condensing as 100 volume peroxide. The ammonium persulphate process is the most recent. An acid solution of ammonium sulphate is electrolyzed, with the formation of ammonium persulphate, which when distilled reacts as $(\text{NH}_4)_2\text{S}_2\text{O}_8 + \text{H}_2\text{SO}_4 + 2\text{H}_2\text{O} = (\text{NH}_4)_2\text{SO}_4 + 2\text{H}_2\text{SO}_4 + \text{H}_2\text{O}_2$. A small addition of phosphoric acid is made to assure the greatest stability.—E. I. ROSENBLUM *Australasian J. Pharm.*, 16 (1935), 35 (T. G. W.)

Selenium—Distribution of, in Nature. The author has analyzed a large variety of geological materials for their selenium content and points out the economic importance of the distribution of selenium in nature, particularly in the fields of biology and agriculture. In spite of the fact that this is a rather rare element, its occurrence in amounts as small as 1 to 10 parts per million may constitute a great danger to agriculture as a toxic substance to plants and animals. Selenium is definitely poisonous and the gravity of this menace to mankind cannot be minimized.—LESTER W. STROCK *Am. J. Pharm.*, 107 (1935), 144 (R. R. F.)

Kaolin—Pharmaceutical. The standards prescribed for kaolin are critically reviewed. Results of tests are given. Paragraph four in the monograph on Kaolin in the Belg. Phar. should be changed as follows: Mix intimately 3 Gm. of kaolin with 30 Gm. of water and 1 Gm. of hydrochloric acid. Shake the mixture frequently and after 2 minutes, filter. The filtrate should not be altered by hydrogen sulphide nor colored blue immediately on addition of potassium ferrocyanide. Alkalinize with ammonia water and filter; the filtrate should not form a precipitate with ammonium oxalate or with sodium phosphate. Treat 1 Gm. of kaolin with a mixture of 5 cc. diluted hydrochloric acid and 5 cc. of water, shake and filter. Five cc. of the filtrate evaporated and dried, should give only 4 mg. of residue.—MAURICE TRAMASURE *J. pharm. Belg.*, 17 (1935), 225-228 (S. W. G.)

ORGANIC

Alkaloids

Alkaloids—Synthesis of New Medicinal. Most benzoyl and *p*-aminobenzoyl esters of alcohol bases act as local anesthetics and some basic ethers and amides have the same property, a molecular weight of about 250 appearing to give the optimum action. The tropic and mandelic esters of amino alcohols exert a mydriatic and antispasmodic action, in some the mydriatic action and in others the intestinal action predominates. Methylcarbamic esters of basic phenols exert a myotic and intestinal stimulating action. Aminoalkoxy quinoline and -acrine derivatives in which the amino group carries a basic side chain exert a toxic action on the malaria parasite. Derivatives of isoquinoline with alkoxy groups and heavy substituents have an antispasmodic effect. In many cases it is possible to deduce through which nerves, organs or tissues the action takes place and thence that the solubility relationships of the compound must result in its having an affinity for certain parts of the body. The evidence shows that papaverine acts directly on smooth muscles whereas atropine produces its effects through the parasympathetic nervous system. Usually it is not possible to explain why an alkaloid exerts a particular action rather than any other. Pharmacology and medical chemistry have produced many useful drugs if they have not succeeded in explaining their action.—J. A. AESCHLIMANN *J. Soc. Chem. Ind.*, 54 (1935), 135T (E. G. V.)

Cereus Coryne—Alkaloids of. The cactus *Cereus coryne*, abundant in Cordoba (Argentina) was extracted with 96% warm alcohol acidified with acetic acid. The extract was concentrated *in vacuo*, diluted with water and again concentrated to remove the alcohol. Resins precipitated in aqueous solution. Intravenous injection of the purified extract, into chloralosed dogs, immediately increased the amplitude of respiration and produced an initial decrease in pressure followed by an increase. Section of the vagus suppressed the initial hypotension. The hypertensive activity of this 1% alkaloid extract was similar to 0.8% nicotine or 1.25% candicine iodide solution. In toads, a subcutaneous injection of 0.5 cc. of the cactus extract produced marked secretion by the cutaneous glands, muscular incoordination, paralysis and cessation of respiration.

in 6 minutes From the chemical and pharmacological behavior of the extract, the active principle was believed to be a dihydroxyphenyltrimethyl ammonium derivative This base was synthesized and found to have a similar action —L RETI, R I ARNOLD and F P LUDUENA *Compt rend soc biol*, 118 (1935), 591, through *Squibb Abstract Bull*, 8 (1935), A-499

Curare Several species of *Strychnos* were tested for curare content only *S. toxifera* contained significant amount of curarine (0.2%) Chemical examination of tubocurarine yielded crystalline tubocurarine, dextrorotatory and with the empirical formula $C_{19}H_{27}O_3NCl$ an allied substance *d* bebeerine which is less potent was also obtained If the formula for tubocurarine is doubled, a product is suggested isomeric with bebeerine methochloride —H KING *Nature* 135 (1935), 469, through *Chem Abstracts*, 29 (1935), 3464

Ephedrine—Sources of During the year investigations of a number of important indigenous drugs were completed A powerful sympathomimetic alkaloid resembling ephedrine in action was discovered in *Moringa pterygosperma*, a plant commonly grown in the sub Himalayan tracts in northern India A readily available source of ephedrine has also been found in another plant, *Sida cardifolia* which not only grows wild but is cultivated in many parts of India The finding of ephedrine in these plants is significant and opens up the possibility of another source of ephedrine —J TROP *Med Hyg*, 38 (1935), 17, No 5, through *Squibb Abstract Bull*, 8 (1935), A-462

Ergometrine A brief review of the work of Moir and Dudley, and of Karasch and co workers on new ergot alkaloids —K O MOELLER *Dansk Tids Farm*, 9 (1935), 121

(C S L)

Ergot Alkaloids Ergot alkaloids may be obtained in a pure form by shaking ergot alkaloids with an aqueous solution of caustic alkali acidified with lactic acid and then with an organic solvent The two layers are separated and the alkaloids recovered from the organic solvent by evaporation and crystallization The product may be further purified by recrystallization —FIRMA E MERCK (Willi Kussner) Ger Pat 606 778, Dec 11, 1934 (Cl 12p 11 01)

(S W G)

Ergotocin Active Principle of Ergot Responsible for the Oral Effectiveness of Some Ergot Preparations on Human Uteri (A communication) The authors claim to have isolated a pure crystalline principle from ergot A yield of 0.3 mg is roughly equal to 3–4 Gm of the crude defatted ergot It is uniformly effective in oral doses of 0.3 mg and intravenous doses of 0.1 mg Its action is instantaneous and its effect lasts for three to four hours It possesses low toxicity Chemically it is a base melting with decomposition at 155° C It forms well defined salts and is not precipitated by Meyers' reagent in dilutions greater than 1 part in 7500 The method and analysis are not given —M S KHARASCH and R R LEGAULT *J Am Chem Soc*, 57 (1935) 956

(E B S)

Ipecac Root—Localization of the Alkaloids in Some textbooks state that the alkaloids are localized just outside the cambium ring in ipecac root which may be demonstrated by the use of picric acid or potassium dichromate The author however, has applied a new method and finds the alkaloids to be localized in the cortical cells near the cork The cross sections are placed in a 10% solution of potassium ferrocyanide for several minutes the alkaloids being precipitated by this reagent The excess is then washed out and the ferrocyanide combined with the alkaloids made visible by treatment with ferric chloride The alkaloidal cells become an intensive greenish blue The reaction is sharp and the cells stand out in contrast to the other cells in the tissue If the section is not too thin and is subsequently cleared with chloral hydrate a beautiful reaction results, always showing the alkaloids to be localized peripherally This microchemical result was checked by removing consecutive layers from the root with a file dialyzing the resultant powders in dilute hydrochloric acid and testing the dialyzed solutions with such alkaloidal reagents as iodine potassium iodide potassium mercuric iodide, potassium cadmium iodide potassium bismuth iodide, picric acid and potassium dichromate The author suggests that the precipitates obtained by treating sections with picric acid and potassium dichromate which were found by previous workers to occur just outside the cambium ring were due to albumin This albumin does not combine with the ferrocyanide —M WAGENAAR *Pharm Weekblad*, 72 (1935), 513

(E H W)

P'an-shua—Chemical Composition of The Chinese drug p'an shua (*Pinellia tuberifera* Ten or *P. ternata* Breit) has an anesthetic action and gives an ether extract having alkaloidal reactions

—TEN-HAN TANG and TSEI-YING TSENG *Natl Shangtung Univ Chem Lab Repts*, 3 (1934), 63, through *Chem Abstr*, 29 (1935), 3115

Phenyl Procaine—Local Anesthetics Report is made of a study of the phenyl derivatives of procaine and its analogues. Because of the comparatively greater activity and lesser toxicity of *o*-phenyl phenol over phenol it was thought that substitution of a phenyl group on the benzene nucleus of procaine would yield a product of greater potency and less toxicity. The synthesis used was the preparation of 2-carboxy 5-amino diphenyl and subsequent reaction of the sodium salt with β -diethylamino ethyl chloride. Phenyl-procaine is an active anesthetic but it precipitates upon the addition of buffers and in corneal and intradermal tests it caused irritation. Analogues of phenyl procaine were synthesized for the purpose of determining effect of increasing the size of the dialkyl amino alkyl group (III), ascertaining the effect of alkylating the amino group (IV), investigating the effect of halogenation (V), observing effect of elimination of amino group (VI). The hydrochlorides of IV and VI are too acid for testing and III and V were too inactive to warrant further investigation. A compound (VII) was found to be rather inactive and the amino group was shifted from the 5- to the 4'-position and an aqueous solution of the hydrochloride of this substance (VIII) was also inactive. Biological tests indicated that phenyl procaine is more active than cocaine hydrochloride and novocaine. Tabulation of comparative tests on guinea pigs shows this. It was also more active on the rabbits cornea but slightly irritating. The most active of the compounds is the hydrochloride of β -diethylamino ethyl 2-phenyl 4-amino benzoate.—W. BRAUER and W. G. CHRISTIANSEN *J Am Pharm Assoc*, 24 (1935), 358 (Z M C)

Strychnine Benzoates—Solubility of Some The solubilities in water at 20°, 30°, 40°, 50°, 60°, 75° and 95° have been determined for the following strychnine salts: benzoate, *o*-, *m*- and *p*-chloro-, -bromo-, -iodo-, -nitro-, hydroxy-, methyl- and -aminobenzoates, 3,5- and 2,4-dinitrobenzoates, 2,4,6-trinitrobenzoate, and 5-iodo-, 3,5-dinitro- and diiodosalicylates. A table lists the results.—CHARLES POE, JOHN F. SUCHY and GEORGE L. BAKER *J Phys Chem*, 39 (1935), 239, through *Squibb Abstract Bull*, 8 (1935), A 557

Valerian Alkaloids Presence of α -Pyrrol methyl ketone in stabilized official Valerian. α -Pyrrol methyl ketone is reported for the first time to be present in plants, having been found to constitute an active principle of valerian. Experiments were performed on industrial residues obtained from fresh rhizomes and roots of valerian stabilized by alcohol. The filtrate obtained after the distillation of the alcohol was washed with ether and the resulting acid residue neutralized by a 25% aqueous solution of sodium carbonate. The uncombined material was extracted with ether, the ether evaporated off and the crude semi liquid mass left saponified with 10% alcoholic potassium hydroxide. The solution obtained was concentrated, taken up with water and extracted with ether. The above ketone was isolated from this extract by distillation, the distillate going over between 60° and 125° under 0.75 mm pressure, being rectified to a slightly yellow-colored liquid, b_D^{25} 68–73°, which crystallized after standing for 13 hours on ice. Fractional crystallization from boiling petroleum ether yielded white, silky needles, m 90°, soluble in water and the usual organic solvents.—E. CIONGA *Compt rend soc biol*, 200 (1935), 780, through *Squibb Abstract Bull*, 8 (1935), A-482

Veratrine Alkaloids Parts I and II. Veratridine (I) isolated from commercial veratrine by the formation of the nitrate salt, and purified by reprecipitation as the nitrate and precipitation as the sulphate, softened, when heated, over the range 160–180° and had $[\alpha]_D^{25} +8.0^\circ$ (4% solution in 96% alcohol). After drying at 110° in a high vacuum, I lost its adsorbed water and in addition decomposed slightly, giving off water. I was obtained in a 21% yield. Cevadine, m 199–201°, was obtained from the filtrate after precipitation of I as the nitrate. Alkaline hydrolysis of I yielded slightly less than the theoretical amount of cevine (II) and the mother liquor yielded veratric acid, m 179°. Dehydrogenation of II with selenium gave cevanthridine (III), m 208° in a yield of 100 mg from 5 Gm of II. The hydrochloride of III melted at 245° and the picrate decomposed at 230–240°. The methiodide melted at 254–256° with decomposition. At higher temperature the yield of III is diminished and a crystalline hydrocarbon isolated.—B. K. BLOUNT *J Chem Soc* (Feb 1935), 122, through *Squibb Abstract Bull*, 8 (1935), A 559

Wei-ling-sein—Studies on The Chinese drug wei ling sein, identified as *Clematis angustifolia* Jacq., functions as an anesthetic and contains an unidentified alkaloid.—TEN-HAN TANG and CU HSIANG CHAO *Natl Shangtung Univ Chem Lab Repts*, 3 (1934), 19, through *Chem Abstr*, 29 (1935), 3115

Essential Oils and Related Products

Achillea Millefolium Linnè—Volatile Oil of Although L F Bley has been given credit for first producing this volatile oil in 1828 it now appears that one or several prior workers undoubtedly obtained this volatile oil more than a century before the publication of Bley's work. Work carried on by the author indicates that the optical rotation value given by Haensel (*Berichte*, 4 (1901), 25) is in error. The true value, as well as figures for specific gravity and refractive index are given—R L McMURRAY *Am J Pharm* 107 (1935), 33 (R R F)

Artemisia Rigida (Nutt) Gray—Oils of The authors found that the blooming tops of this plant yielded 0.56% of a volatile oil, of which 27.92% were stereoptene and 72.08% were oleoptene at 15° C. The oleoptene was amber to yellowish in color, becoming deeper colored with age, odor pungent and somewhat camphoraceous, taste warm, persistent and aromatic, feel turpentine like. It was acid to litmus paper. It was miscible with absolute alcohol, 95% alcohol, acetone, glacial acetic acid, chloroform, ether and petroleum ether, immiscible with carbon disulphide. The following constants were obtained on the oleoptene: Specific Gravity, 25°/25° C 0.9367, Optical Rotation 100 mm tube 25° C, -15.68°, Specific Rotation 25° C -16.75°, Refractive Index 25° C 1.4674, Acid Value 3.63, Ester Value, 19.46, Saponification Value 23.09. After the removal of the volatile oil by steam distillation, the material was further treated and a fatty oil amounting to 1.88% was obtained. The fatty oil was viscous and very dark green in color. The following constants were determined for this fatty oil of *Artemisia Rigida* (Nutt) Gray: Specific Gravity 40°/40° C 0.9945, Refractive Index 40° C, 1.4968, Acid Value 36.68, Ester Value 91.64, Saponification Value 128.32, Iodine Value, 58.71—G NORRIN and R L McMURRAY *Am J Pharm* 107 (1935), 177 (R R F)

Camphor—Production of, from *Ocimum Canum* The Japanese *Cinnamomum camphora* from Formosa and the German synthetic camphor have been the only sources of supply of camphor for Russia. *Ocimum canum* was first successfully cultivated by the French under the direction of E Scharabots in 1930. *O. canum* exists in two forms which cannot be differentiated morphologically, but which yield two differently constituted oils. One variety contains methyl cinnamyl ether ($C_{10}H_{16}O_2$) while the other contains camphor ($C_{10}H_{16}O$). Yields of from 35 to 50% of camphor have been obtained from the camphor containing oil of *O. canum*. In Krasnodar Russia *O. canum* can be cultivated as an annual plant. This Krasnodar variety contains on an average 2.48% of ethereal oil from which 44.34% of camphor can be obtained by freezing. The plant requires no particular care under cultivation and yields camphor the very first year. A detailed macro and microscopic description of the plant is given. The technique of planting and cultivation is described minutely. The procedure for the extraction of the camphor is as follows: The plant is distilled with water in a still having a wide but short head. The distillate is shaken with 5% of its volume of benzine to dissolve out the camphor. The camphor is extracted from the benzine with alcohol. Since the ethereal oil solidifies very easily and stops the condenser, the distillation can be carried out without the use of a condenser. The alcoholic solution is imbedded in ice and the camphor which congeals is separated from the liquid portion by compression. The pressed material is redissolved in alcohol, filtered and the solution concentrated at 80° to 100° C. At 100° C camphor is fluid and is poured into forms from which is obtained on cooling a transparent mass. The physical properties of camphor obtained by this process are listed—A ROTER MEL *Pharm Ztg*, 80 (1935) 337 (G E C)

Citronella Oil—Java A graph is given which presents a clear picture of the particularly unsatisfactory situation which the oil has developed, especially in the last two years. In 1933 the export expanded by about 53.5% as compared with the preceding year, while in 1934 the increase as compared with 1932 amounted to about 79.5%. The larger production results from the increased acreage under serah grass. In this connection three tables are included which give a survey of the last five years. Other graphs and tables are given which show the countries of destinations of the shipments in the last five years—A F HACCOW *Perf and Ess Oil Rec*, 26 (1935) 165 (A C DeD)

Eucalyptus Oils—Development of Our Knowledge Concerning Eucalyptus oil was one of the first products exported from Australia in 1788. Joseph Bosisto, a Victorian pharmacist, played an important part in the establishment of the eucalyptus oil industry in 1852. Eucalyptus trees are mostly Australian, although some species are found in New Guinea, Timor and the Philippine Islands. Essential oils from Eucalyptus are useful commercial products and are ex

ported from Australia to the extent of 100,000 gallons a year. There are over 350 species of this genus but less than 20 yield an oil of commercial value. The first investigation of Eucalyptus oils was made by M. Cloez in 1870 upon the oil of *Eucalyptus globulus*. This oil, known as cineol, distills at 175° C. Several other constituents, such as acetic and formic acids, butyric and iso-valeric aldehydes were isolated by M. R. Voiry in 1888. R. T. Baker and H. G. Smith later showed an obtuse "feather" venation was indicative of a low yield of oil, with pinene as the principal constituent, a lateral venation with a marginal vein represented a slightly higher oil yield with cineol and pinene as constituents, while "butterfly wing" venation gave a high yield of oil with a composition of phellandrene and piperitone.—A. R. PENFOLD *Australasian J. Pharm.*, 16 (1935), 29 (T. G. W.)

Hyptis Mutabilis—Volatile Oil of. Material for this investigation was collected in Florida and was of two types, green stemmed and red stemmed. These were studied separately. The yield of volatile oil from the above ground portion of the plant was from 0.012% to 0.02% and seemed to be identical in the two varieties. The oil has a high hydrocarbon content and the presence of sabinene and caryophyllene is indicated.—HAROLD W. WERNER *J. Am. Pharm. Assoc.*, 24 (1935), 289 (Z. M. C.)

Patchouli Oil of the Seychelles. A discussion of patchouli oil including the propagation of the plant, the harvesting, the preparation of leaves prior to distillation, the distillation and the controlling ordinances.—W. H. HOEDSWORTH HAINES *Perf. and Ess. Oil Rec.*, 26 (1935), 171 (A. C. DeD.)

Peppermint Oil—from Black Mint Cultivated in Southern Sweden. *Mentha piperita* var. *officinalis* forma *rubicens*, Camus plants grown under favorable conditions in southern Sweden yielded peppermint oil of satisfactory quality.—R. FORNET *Seifensieder-Ztg.* 62 (1935), 223, through *Chem. Abstracts*, 29 (1935), 3465

Violet Odor—Natural. A review of the more recent research concerning violet oil, orris oil, violet-leaf oil and violet root oil is discussed.—F. K. DONOVAN *Perf. and Ess. Oil Rec.*, 26 (1935), 98 (A. C. DeD.)

Fired Oils, Fats and Waxes

Piqui-A Fats—Component Glycerides of. The yield of fats from the whole fruits of the piqui A (*Caryocar villosum*) is about 6 to 7% mesocarp and less than 1% kernel fat. The component glycerides (weight percentages) of the original fat are given as follows (leaving out of account the very small amounts of myristic, stearic and linoleic glycerides present, or, rather, grouping the 1.8% of myristic with palmitic acid, and the similar amounts of stearic and linoleic acids with oleic acid): tripalmitin 2%, dipalmitoleins, 42%, palmitodiolens, 56%. Both α and β palmitodiolens and α and β oleodipalmitins are probably present in quantity.—T. P. HALDITCH and J. G. RIGG *J. Soc. Chem. Ind.*, 54 (1935), 109T (E. G. V.)

Glycosides, Ferments and Carbohydrates

Glycyrrhizin. The dilute alkali extracts of liquorice is treated with a magnesium or calcium salt until there is no further precipitation. Glycyrrhizin separates from the filtrate upon the addition of acid.—KANEGAHUCHI BOSEKI K. K. (Toyo Ito) *Japan Pat.*, 109,401 (Jan. 29, 1935) (S. W. G.)

Strophanthin of Strophanthus Emin. E-strophanthin was obtained from the crushed seeds of *S. Emin* by extraction with 90% alcohol at room temperature after previous defatting with light petroleum. The percolate was concentrated and treated with a slight excess of basic lead acetate, then filtered and the filtrate was freed from lead with hydrogen sulphide. The solution was saturated with ammonium sulphate and the sticky precipitate was extracted with alcohol. The alcoholic solution was either neutralized with sodium hydroxide and precipitated with ether or precipitated without neutralization. The product was dried at 100° C. *in vacuo*. The yield was 5-7% of the fat free seeds and was similar to that obtained from *S. kombe*. E-strophanthin is a yellowish white powder consisting of vitreous particles, and it is readily soluble in water and in 90% alcohol or dehydrated alcohol. It is almost insoluble in ether, chloroform, benzene or light petroleum. E-strophanthin may be differentiated from L-strophanthin by the color reactions given by Smelt (*Quart. J. Pharm. Pharmacol.* 6 (1935), 467). E-strophanthin contains "water of hydration" in addition to 'hygroscopic moisture' determinations giving 5.9, 3.5% of "water of

hydration" and 19.10% of 'hygroscopic moisture' A 2% aqueous solution had a pH 4.2, but was neutral on dilution to 0.1% It complies with the U S Phar test for reducing sugars in strophanthin, and was found to have a specific rotation $[\alpha]_D =$ about $+10^\circ$ (c in dehydrated alcohol = 2) E-strophanthin was examined chemically by Jacobs and Bigelow (*J Biol Chem* 99 (1933) 521, 101 (1933), 697) and was found to be similar in type to that of the official L-strophanthin, but the two are not identical E strophanthin has a cardiotonic activity equal to that of the British Standard Strophanthin—I D LAMB and S SMITH *Quart J Pharm Pharma col*, 8 (1935), 71-74 (S W G)

Other Plant Principles

Cimicifuga Racemosa—Constituents of the Rhizome of From the rhizome were isolated a very soluble acid saponin, a glucoside tannin containing a phlobaphene, another water soluble glucoside and a glucoside insoluble in water but soluble in alcohol Only the last named has a cardiotoxic action in dogs The lethal dose is 20-30 mg/Kg when given intravenously—F MERCIER and J BALANSAND *Compt rend soc biol*, 118 (1935), 79, through *Chem Abstr*, 29 (1935), 3111

Digger Pine (Pinus Sabinana)—Non-Heptane Constituents of The chief constituent of Jeffrey Pine oil heptane has been studied previously Investigation of non heptane constituents revealed *n* octylic, *n* nonylic and *n* decylic aldehydes In the present study, that portion of the oil of digger pine which boils above 110° was studied Aldehydes were removed by shaking with a 30% solution of sodium acid sulphite The solid addition product was separated, washed, the aldehydes regenerated with sodium carbonate and separated by steam distillation Ten fractions were obtained but melting points of derivatives were inconsistent so individual fractions were refractionated Constants were determined and these are tabulated with those of previous workers *n* Octylic, *n* nonylic, *n* decylic and *n* myristic aldehydes were identified *n* Lauric aldehyde is indicated and there are indications of the presence of other aldehydes but it was not possible to obtain derivatives pure enough to characterize the compounds—ARTHUR H UHL *J Am Pharm Assoc*, 24 (1935), 390 (Z M C)

I-mao-tsao—Composition of Purple-Flowered A complete examination of i mao tsao (*Leonurus sibiricus* L.) is given but no positive evidence of alkaloids is found—TENG HAN TANG and CHI-WO HSU *Natl Shanglung Univ Chem Lab Repts*, 3 (1934), 93 through *Chem Abstr*, 29 (1935) 3115

Picrotoxin—Preparation of One kilogram of ground fish berries, *Anamirta cocculus* (L) Wight and Arn., is heated to boiling for 45 minutes with 2 liters of 95% ethanol filtered and the residue washed three times with 750 cc portions of hot alcohol The combined extract and washings are concentrated to 1 liter Two volumes of water at 75° are added with stirring to the hot concentrate, after which ice is added to make a volume of 5 liters When the ice is melted the liquid is separated from insoluble fatty material by filtration through folded filter paper The residue is washed with a liter of water and the combined filtrates are passed through a thin layer of norit in a small Buchner funnel The filtrate is concentrated under reduced pressure to 600 cc Crystals of picrotoxin are removed from the flasks from time to time After standing over night the crystals are removed from the mother liquor, washed with a little cold water, and dried A second crop of crystals is obtained upon further concentration The yield is about 1.4% of the drug and is quite pure except for a little coloring matter The analytically and optically pure product is obtained as follows 10 Gm of picrotoxin in 30 cc of hot acetone is filtered through a thin layer of norit upon a small Hirsch funnel and the adhering substance is washed from the apparatus with 15 cc of hot acetone The combined filtrate and washings are heated to boiling and three volumes of hot water are added Upon cooling well formed crystals having a melting point of $203-204^\circ$ separate—E P CLARK *J Am Chem Soc*, 57 (1935) 1111 (E B S)

Unclassified

Alkoxy-Cumarins—Relation between Odor and Constitution in the Case of Fifteen coumarin derivatives are discussed including the new compound 4 methyl umbelliferon ethyl ether which has a celery like odor and taste and appears to have some application as a seasoning agent—A ST PFAU *Ruckstoff-Ind*, 10 (1935), 57-58 (H M B)

Arsphenamine Aminohydroxybenzene-arsonic acid is electrolytically reduced in a

sulphuric acid medium, using lead electrodes with an iodide present as a catalyst —G A KIRKH-GOF and O I KORZINA Russ Pat, 34,538 (Feb 28, 1934) (S W G)

Mercury Compounds—Study of Germicidal and Antiseptic Activity of Some The three compounds studied were 3,3'-dibrom-4,4' dihydroxy 5-5' diacetoxymercuri diphenyl dimethyl methane (I), 3,3 dinitro-4-4'-dihydroxy-5-5' diacetoxy-mercuri diphenyl dimethyl-methane (II), and a mono acetoxy-mercuri derivative of 5',5'-dibromo resorcinol diphenen (III) A fourth product obtained from the last-named compound in which the position of the mercury was not determined was studied also Compounds I, II, IV showed useful germicidal activity Compounds I and IV were tested on tissues, I was non-irritating to shaved abraded skin, showed slight swelling in subcutaneous tissue on repeated injection autopsy showed no degenerative change Compound IV was slightly irritating to shaved abraded skin and caused slight swelling on subcutaneous injection and a scab at site of intradermal injection Details of experimental procedure are given Preparation of the compounds was along familiar lines, mercuration of suitable intermediates being effected in boiling alcohol solution —E MONESS, S E HARRIS and W G CHRISTIANSEN *J Am Pharm Assoc*, 24 (1935), 386 (Z M C)

Ortho-Aminophenol—Acyl Derivatives of When diacyl derivatives of *o* aminophenol were prepared by the usual methods it was found that the order of introduction of the two different acyl groups gave identical rather than isomeric products indicating that a rearrangement must have occurred in one case Positions of the acyl groups were determined by removing the group attached to the oxygen by saponification and determining from physical constants of the mono-acylated product the group attached to the nitrogen Formation of isomeric diacyls and production of the same saponification products indicates rearrangement occurred during saponification Experimental evidence indicates that certain acyl groups have more influence than others The present investigation was a further study of the factors of rearrangement The acylating agent was *o* *n* heptanoyl chloride, this group being heavy and less acidic than any group against which it was introduced This group was introduced against the *n* butyryl, *n*-valeryl, *n*-caproyl, phenyl-acetyl and hydrocinnamyl groups The authors reached the following conclusion "Apparently relative weight and acidity are not the controlling factors in this type of rearrangement When complete rearrangement did occur, the nitrogen atom was shown after saponification to be attached to the heavier and less acidic group in three cases and to the lighter and less acidic group in one case One case showed only partial rearrangement In this case, saponification products showed part of the nitrogen to be attached to the heavier and more acid group while the remainder of the nitrogen was attached to the lighter and less acidic group" Experimental details are reported Properties of the two monoacyls prepared are given The ten diacyl derivatives prepared are named, formulas given, analyses given Saponification products are also given Some of the compounds are being studied for antiseptic and physiological effects and the results of this study will be published later —C B POLLARD and W T FORSEE, JR *J Am Pharm Assoc*, 24 (1935), 363 (Z M C)

BIOCHEMISTRY

Chemistry—Some Recent Contributions of, to Medicine Among the contributions discussed are vitamins hormones choline and related compounds, and anesthetics —R T MAJOR *J Soc Chem Ind* 54 (1935), 447 (E G V)

2-4 Dinitrophenol—Effect of Repeated Washing on Stimulation of Yeast Respiration by Washing has no influence It is concluded that dinitrophenol acts directly on systems within the cell and that extracellular catalysts are not essential for such action —J FIELD, 2ND and A W MARTIN *Proc Soc Exptl Biol Med*, 32 (1935), 1285 (A E M)

Estrin—Extraction of, from Female Urine after Acidification with Various Acids Urine acidified with tartaric acid produced the greatest yield of estrin —W KENNETH CUYLER *Proc Soc Exptl Biol Med* 32 (1935) 1352 (A E M)

Food Chemistry—Twenty-Five Years of A review covering fundamental advances made in the study of the ingredients of foods —L H LAMPITT *J Soc Chem Ind*, 54 (1935), 426 (E G V)

Gonad-Stimulating Product Blood is taken from pregnant mares which are between the 37th and 130th day of gestation, and the serum is obtained from the blood —H H COLE and G H HART U S Pat, 1, 994,853 (Mar 19, 1935) (S W G)

Insulin—New Method for Precipitation of Insulin is removed quantitatively from aqueous solutions as a bluish precipitate by the addition of 0.2% potassium ferrocyanide solution. For very pure insulin about 0.1 mg potassium ferrocyanide is required to precipitate 100 units, commercial products require 0.6–2.0 mg since other substances present are also precipitated. The filtrate in all cases contains inactive protein derivatives which precipitate with picric acid. Good commercial insulins containing 20–22 units per mg dry substance yield a dried ferrocyanide precipitate, weighing 4–6 mg per 100 units. Less refined products yield precipitates weighing 7–10 mg per 100 units, and hence the quality can be judged by the weight of the precipitate. The insulin ferrocyanide precipitate (Ferrinsulin) can be dissolved in 2% sodium acid phosphate solution and injected. In rabbits its action is less marked but more prolonged than that of ordinary insulin.—I. I. NITZESCU and S. SECAREANU *Bull soc chim biol*, 17 (1935), 118, through *Chem Abstracts* 29 (1935) 3463

Phenol—Partition of, between Olive Oil and Serum in Ascitic Fluid Quantitative determinations are reported of the content of phenol in serum or ascitic fluid after reaching equilibrium of partition with phenol solutions in olive oil. The phenol is determined by Wilkie's iodine method (*J Soc Chem Ind*, 30 (1911), 398). The partition coefficient of phenol between the olive oil and the serum or ascitic fluid is found to be of the same order as the partition of phenol between olive oil and water. Hence it is concluded that the proteins of the serum do not bind significant amount of phenol. The relationship is shown in a graph.—A. HEEDE and S. STENSIG *Dansk Tids Farm* 9 (1935) 86 (C S L)

Pregnancy Diagnosis A review of the different methods is given. The procedure of Joel and Andreani-Constantin using male guinea pigs of one month of age was investigated. The injection of 2 cc of urine was made into the heart and the hypertrophy of the sexual organs was observed after 48 hours. The results were reliable.—LUIS S. GISMONTI and BENIGNO S. ACEVEDO *Semana med* (Buenos Aires) 42 (1935), 1194 (A E M)

Vitamin Synthesis—A comprehensive review of the properties leading to and the methods of synthesis of the vitamins. The syntheses of vitamins A, B₂ and C are described in detail with the aid of structural formulae. A graphic formula of ergosterin is given.—OSKAR BAUER *Pharm Zentralh*, 76 (1935) 129 (E V S)

Vitamin B₁—Studies of Crystalline VIII Sulphite Cleavage II Chemistry of the Acidic Product The chemistry of the acidic product, C₆H₇N₃SO₃ (I), obtained by the sulphite cleavage of vitamin B₁ is given. It has the properties of a sulphonic acid. Heating with moist sodium hydroxide at 185° eliminated the sulphur as alkali sulphite and water at 200° yielded sulphuric acid. Refluxing with strong hydrochloric acid removed 1 mole of ammonia yielding C₆H₈N₃SO₄ (II). Further study showed a similarity between (I) and 6 aminopyrimidine, and between (II) and 6 oxypyrimidine.—ROBERT R. WILLIAMS, EDWIN R. BUCHMAN and A. E. RUEHLE *J Am Chem Soc*, 57 (1935), 1093 (E B S)

Vitamins A review of the progress made in the isolation, synthesis and determination of the constitution of these bodies.—P. KARRER *Pharm Monatsh* 16 (1935) 48–50 (H M B)

Vitamins—History of the Discovery of A brief historical review of the discovery and the physiological and therapeutic actions of the known vitamins.—G. ROLAND *J pharm Belg*, 17 (1935) 111–115 (S W G)

Urine—Simple Method for Determination of Glucose in The author describes the determination of glucose in urine with the aid of a trade preparation "Glucocord" whose precise composition is not given but which consists of a pulverized alkali hydroxide mixed with a reducible metal compound and a physical activator. The unfiltered urine is dropped onto a small quantity of the powder placed on a white glass or porcelain plate, and if sugar is present the powder blackens to a degree dependent on the sugar content.—E. KARLING *Farm Revy*, 34 (1935), 249 (C S L)

ANALYTICAL

Ammonium Molybdate—Use of, as a Microchemical Reagent The author suggests ammonium molybdate as a microchemical reagent for the detection of the salts of various metals. Crystalline ammonium molybdate is added to the drop in which the metallic salt is dissolved. **Aluminum**—While the reagent is not specific for aluminum it has several advantages over the two customary microchemical reactions. The crystals are square or rectangular. **Manganese**—Reactions with the sulphate and chloride were investigated. The reaction proceeds slowly. Upon

evaporation orange-brown prismatic plates are formed near the edge of the drop, ending in a pyramid (vertical angle 104°) or obliquely (angle 54°). The reaction gives good results even in the presence of aluminum and zinc. *Zinc, Nickel, Cobalt, Iron, Copper* and *Mercury* give similar forms to those obtained with Aluminum. *Zinc*—Reaction not sensitive, in the presence of manganese negative. *Nickel*—An amorphous precipitate slowly becoming crystalline. *Cobalt*—Crystallizes slowly after evaporating and moistening with water. *Copper*—Squares with rounded corners. *Mercury*—Many square plates and right angled prisms. The reaction is very sensitive. *Thallium*—Long needles, reaction sensitive. *Silver Nitrate*—Diamond and octahedral shapes. *Uranyl, Lead, Cadmium* and *Bismuth* salts gave no useful reactions. *Ferrous Sulphate*—Wine red coloration but no precipitate or crystals. *Lithium, Magnesium* and *Calcium* salts (except in large concentration) give no reaction. *Strontium* and *Barium* acetate show little tendency to form crystals. *Cerium Nitrate*—Droplets which upon scratching give orange parallelograms, diamond shapes and long needles. The author concludes that next to its use in demonstrating phosphoric acid, ammonium molybdate is a useful reagent in identifying aluminum, manganese and cerium salts.—C VAN ZIJP *Pharm Weekblad*, 72 (1935), 414 (E H W)

Arsenobenzene Derivatives—Assay of Several. Twenty four preparations of arsenobenzene derivatives were tested for toxicity and therapeutic value. A preparation was non toxic if a dilute solution did not exceed 40% mortality in mice and a stronger solution did not exceed 50% mortality in mice and 40% mortality in rats. Mice infected with trypanosomes were used to test therapeutic value. A standard was used and the preparation had to be as active as the standard. None of the preparations compared favorably with the standard requirements all being either deficient in therapeutic value or too toxic. Tables of results are given.—M ROTHERMUND *Deut Med Wochschr* 61 (1935), 92-95 (H R)

Caffeine—Micro-Determination of, by Colorimetry. The modified Weidel method (*Bull soc pharm Bordeaux*, 72 (1934), 345) is used to obtain an alcoholic solution of the caffeine. The sample should contain 0.1-2.0 mg of the ureide. Evaporate the alcoholic solution to dryness by gentle heating in a porcelain dish, with a handle about 5 cm in diameter. Add 6 drops of saturated bromine water and 9 drops of *N* hydrochloric acid. Mix, then evaporate to dryness by moving the container around below the top of a Bunsen flame, then continue heating in the same manner until the entire surface of the residue becomes orange red without traces of yellow and without evident calcination. Add 1 drop of 5% mercuric acetate in water acidified with 2% acetic acid, mix with a glass rod to dissolve the residue and introduce the colored liquid into a tube with a diameter of 12-15 mm. Compare the color with a series of standards prepared as above containing from 0.1 to 1.2 mg of caffeine. Two drops of a 5% solution of zinc acetate plus 1 drop of glacial acetic acid may be substituted for the mercuric acetate. The orange red residue obtained as above may be dissolved in water to give a rose colored liquid which may be compared colorimetrically, but this is not as good as the other procedures.—GEORGES DENIGES *Bull soc pharm Bordeaux*, 73 (1935), 5-7 (S W G)

Cantharidin—New Microchemical Reaction of. The following procedure is given. Place several particles of the sample on a slide and cover with a drop of concentrated ammonia water. Heat over a small alcohol lamp flame to evaporate the ammonia water, removing the flame while a small moist surface remains to be evaporated by the heat retained by the slide. Examine the dried product under a magnification of 400-500 \times . This product may be sublimed with gentle heat, collecting the sublimate on a superimposed slide and after moistening with a droplet of C_4H_8 and evaporation of the solvent microscopic crystals of cantharidin are formed.—GEORGES DENIGES *Bull soc pharm Bordeaux*, 73 (1935), 7-9 (S W G)

Cholesterol—Fixed Color Standard for, Determination of. A fixed color standard for use with Schoenheimer's and Sperry's micro method for serum cholesterol is described. The use of a mixture of acetic anhydride and sulphuric acid is suggested.—ARTHUR SHAPIRO, HENRY LERNER and EDNA POSEN *Proc Soc Exptl Biol Med*, 32 (1935), 1300 (A E M)

Cinchona—Identification of Preparations of, by the Erythroquinine and Thalleoquinine Reactions. The drug or preparation is extracted several times with chloroform and acidulated water and finally with chloroform. To 2 cc of the chloroform extract add 3 cc of acetic acid (1%) and note the appearance of a blue fluorescence. Then add bromine water (1:10) drop by drop until a persistent yellow color is obtained. Add a 1:10 solution of potassium ferrocyanide using 1 drop of the solution for every 5 drops of bromine water added, then make alkaline with

ammonia (1 10) A rose to red color is obtained depending on the amount of quinine present The thalleoquinine reaction a modification of the above erythroquinine reaction, is not as specific nor as sensitive —M R MONNET *J pharm chim*, 21 (1935), 450 (M M Z)

Citral—Reaction for the Identification and Determination of Alcoholic solutions of methylene blue react with sodium hydroxide to change from blue to rose and this reaction is hastened by citral in addition to other substances Five cc of a mixture containing 1 drop of a 1% solution of methylene blue in methyl alcohol and 20 cc of *N*/10 sodium hydroxide is mixed with 1 cc of a dilute solution of citral in methyl alcohol When mixed at 15° an immediate change from blue to red is apparent if 1 mg of citral is present If a smaller amount of citral is present the color change occurs slowly The reaction may be used quantitatively by comparing the color developed with standards Many other substances give similar reactions, but a longer time is required if 1 mg or less is present —J BOUGAULT and E CATTELAINE *J pharm chim*, 21 (1935), 437 (M M Z)

Colloidal Silver—Determination of, in Organic Medicinals Application to Ointments The different methods used for the destruction of organic compounds containing silver are discussed, and the determination of silver is criticized The use of nitroperchloric acid or nitro sulphoperchloric acid is recommended for decomposing silver organic compounds This can be carried out as follows especially in the case of ointments A weighed sample of about 0.1 Gm to 0.3 Gm is introduced into a 100 cc Erlenmeyer flask followed by 3 cc of sulphuric acid ($d = 1.84$) and 5 cc nitric acid ($d = 1.38$) The mixture is warmed until brown fumes are no longer apparent, and a mixture of 3 parts of perchloric acid ($d = 1.61$) and 1 part of nitric acid ($d = 1.38$) is then added drop by drop until the liquid is decolorized The mixture is then boiled for 1 or 2 minutes to expel the excess hydrochloric acid generated It is then cooled, 20 cc of distilled water and 2 cc saturated iron alum solution are added and the silver determined by titration with 0.1*N* potassium sulphocyanate This method gives maximum accuracy in minimum time according to the author —GEORGES ANTOINE *J pharm chim* 21 (1935) 457 (M M Z)

Copper—Quantitative Microdetermination of A comparative study was made of three methods of evaluation (a) precipitation by means of 5,7 dibromo 8 oxyquinoline (5.7 dibromo oxine) according to R Berg and H Kustenmacher, (b) precipitation as copper benzoate according to F Feigl and to R Strebing, (c) precipitation as copper salicylaldoxime according to F Ephraïm and to W Reif Suitable techniques were devised in all three cases for the microdetermination of copper Of the three methods, (a) was found to be the most precise, since the conversion factor is lowest in this instance —F HECHT and R REISSNER *Mikrochem* 17 (1935), 127 (L L M)

Copper—Determination of Small Quantities of The following method was proposed A dithizone (diphenylthiocarbazone) solution (0.1 Gm in 50 cc of carbon tetrachloride) is shaken with two 50 cc portions of dilute ammonium hydroxide (1 + 99) The combined ammoniacal extracts are slightly acidified with hydrochloric acid the precipitated dithizone filtered off, washed with water and dried A 100 cc portion of a 0.01% solution of the dithizone in carbon tetrachloride is shaken with an equal volume of water containing 0.5 cc of ammonium hydroxide The carbon tetrachloride layer is discarded This is repeated until only a trace of pink color is seen in the carbon tetrachloride layer The dithizone is precipitated with hydrochloric acid and extracted with carbon tetrachloride, and the solution is made up to the desired strength Two hundred cc of a solution containing 12 Gm of sodium pyrophosphate and 0.5 Gm of sodium carbonate is shaken with 50 cc of a 0.01% solution of dithizone in carbon tetrachloride The carbon tetrachloride layer is discarded This is repeated until only a trace of pink color remains The dithizone remaining is extracted from the solution with amyl alcohol the amyl alcohol removed with carbon tetrachloride The solution should be re tested before using The sample is ashed in a silica dish at about 500° C The ash is dissolved in water and made up to volume A 10-cc portion of the solution containing not over 0.005 mg of copper is made neutral to methyl orange with ammonium hydroxide acidified with a 2 cc excess of concentrated nitric acid and extracted with 3 cc of 0.003% dithizone in carbon tetrachloride The carbon tetrachloride extract is washed with water, acidified with a few drops of hydrochloric acid The washed carbon tetrachloride solution is then shaken with a solution containing 5 cc of water and 5 cc of the pyrophosphate-carbonate solution and the resulting solution compared in a Nessler tube with standards

containing 0.0005 and 0.001–0.005 mg of copper in increments of 0.001 mg. A blank is also used.—R. M. MEHURIN *J. Assoc. Official Agr. Chem.*, 18 (1935), 192 (G. S. W.)

Digitalis—Baljet Color Reaction of Compounds of The Baljet colorimetric method for the determination of glucosides is also suitable for the determination of genins. It consists in treating the compound with sodium picrate and comparing the color maximum developed with a standard solution of potassium dichromate. Determinations were compared for digitoxin, digitoxigenin, gitoxin, gitoxigenin, g- and k-strophanthin, strophanthidin and digland A. The reaction was more intense for the aglucones, genins, than for the glucosides and more intense for the lower molecular weight compounds. The development of the color seems to be associated with the unsaturated hydroxylactone group. Scillaren A did not give the Baljet reaction nor other reactions characteristic for the unsaturated lactone group of the glucoside. The test is not specific for the unsaturated lactone group of the glucoside. The test is not specific for the genins since dextrose also gives the color reaction, however, comparison of the sensitivity and the time required for the development of the color indicates that small amounts of dextrose will not interfere with the determination of the glucosides.—L. LENDLE and W. SCHMELZER *Arch. exp. Path. Pharmacol.*, 177 (1935), 622, through *Squibb Abstr. Bull.*, 8 (1935), A 694.

Drinking Waters—Determination of Lead in Methods sufficiently accurate to determine 0.0001–0.0300 mg of lead per liter are necessary. Water that has been freshly drawn from the tap should be used since it has been found that lead in colloidal forms as lead hydroxide, basic carbonate and hydrocarbonate are present, and these after a time become attached to the walls of the vessel and cannot be removed by shaking, thereby giving low results. The sample should be treated as follows: "Transfer all of the sample to a flask, retaining about 10 cc. to which add dilute acetic acid (5 cc. per liter), shake vigorously to dissolve the lead on the walls of the vessel. Return the portion of the sample that was removed, allow to stand until the bubbles of carbon dioxide have subsided." Turbid waters or those in which iron has separated should not be filtered since such suspensions retain the lead to such an extent that all of it may be removed and these should be treated as under "Turbid Waters." Methods are given for clear and colorless waters, turbid and slightly colored waters, and strongly colored (humous) waters. Special treatments to eliminate errors due to the presence of copper, nitrite, iron and aluminum are given.—K. HOLL *Apoth. Ztg.*, 50 (1935), 126–128 (H. M. B.)

Fluorine—Determination of, in Foods In the use of lime as a fixative for fluorine during ashing of samples it was found necessary to employ a large excess of the lime. For determination of very small amounts of fluorine, the lime must be treated to remove fluorine present as an impurity. Suggested methods for purification are distillation with perchloric acid followed by recovery of the calcium as the carbonate, or precipitation of calcium as the oxalate. In either case the precipitates are converted to the oxides by incineration.—D. DAHLE *J. Assoc. Official Agr. Chem.*, 18 (1935), 194 (G. S. W.)

Iodine Number—Rapid Method for the Determination of The method of B. M. Margosches was adapted to a micro technique. One cc. of solvent, 2 cc. of *N*/5 alcoholic iodine solution and 20 cc. of water were used in the micro method. The iodine was titrated with *N*/20 sodium thiosulphate.—W. RUZICKA *Mikrochem.*, 17 (1935), 215 (L. L. M.)

Iron—Determination of Metallic, in Presence of Iron Oxides **Reduced Iron** The copper sulphate method for the determination of metallic iron in reduced iron has been shown to yield inaccurate and variable results. The following modification of the Wilner-Merck process is recommended. To about 0.5 Gm. of sample, accurately weighed, in a clean, dry 100-cc. graduated flask, add 2.5 Gm. of mercuric chloride (sulphide free) and about 50 cc. of recently boiled and cooled distilled water. Boil gently for 20 minutes (avoiding excessive frothing) with frequent shaking, make the volume up to 100 cc. with recently boiled and cooled distilled water, stopper the flask and cool. When cold, adjust the volume to 100 cc., shake well, allow the precipitate to settle, filter rapidly into a clean, dry conical flask, pipette 50 cc. of the filtrate into 100 cc. of dilute sulphuric acid in which 2 Gm. of manganese sulphate has been dissolved and titrate with 0.1*N* potassium permanganate solution. The experimental work reported is tabulated.—F. HARTLEY, W. H. LINNELL, I. E. READ and H. G. ROLFE *Quart. J. Pharm. Pharmacol.*, 8 (1935), 100–112.

(S. W. G.)

Lime and Bleaching Powder—Presence of Manganese in Commercial All the samples of commercial lime and bleaching powder examined showed the presence of small amounts of manganese. The manganese was determined colorimetrically by an application of the periodate method as follows. In the case of samples of bleaching powder, quantities of 1 Gm. were treated with 7 cc. of water and 30 cc. of concentrated nitric acid, evaporated to small bulk, treated with a further 7 cc. of nitric acid, and again partially evaporated. The hot solution, which was now free from chloride, was treated with 5 cc. of nitric acid and 0.4 Gm. of potassium periodate, boiled for one minute, kept hot for 10 minutes, cooled, diluted to 100 cc. and compared colorimetrically with standards prepared from varying quantities of manganese sulphate by oxidation with periodate. In the case of samples of lime the double evaporation with nitric acid is unnecessary. Seventy-seven to 137 parts of manganese per million were found. The authors prove that the pink coloration of preparations from bleaching powder especially those containing sodium bicarbonate is due to the presence of manganese and not iron as has been claimed.—JOHN E. DRIVER and HUBERT A. TURNER. *Quart. J. Pharm. Pharmacol.*, 8 (1935), 113-115. (S. W. G.)

Luminescence Analysis—Advances in Progress in the use of ultraviolet light in qualitative and quantitative analysis is reviewed and a new portable analytical lamp is described.—A. KARSTIN. *Pharm. Monatsh.*, 16 (1935), 45-47. (H. M. B.)

Magnesium and Aluminum—Microchemical Detection of, with Alkannin and Naphthazarin
A. Detection of Magnesium with Alkannin and Naphthazarin in Sodium Hydroxide Solution—Add to 5 cc. of the test solution 5 drops of a 0.05% alcoholic solution of alkannin or a 0.03% solution of naphthazarin and then dropwise a slight excess of 2.5N sodium hydroxide. Depending upon the magnesium content a blue precipitate appears at once or upon warming.
B. Detection of Magnesium with Naphthazarin in Ethylenediamine Solution—In a micro test tube add several drops each of the solution to be tested and of the reagent. The latter consists of a mixture of 5 cc. of 0.03% naphthazarin solution and 1 cc. of 10% ethylenediamine solution. In the presence of magnesium a blue coloration is formed. The limit of sensitivity is 0.35% magnesium, corresponding to a concentration of 1.66/000.
C. Detection of Aluminum with Alkannin and Naphthazarin—Add to the test solution 2 cc. of alkannin or naphthazarin reagent, then with constant agitation enough ammonia water to change the dark red color to blue, and finally an additional 3 cc. of ammonia water. A dark violet precipitate results. With alkannin, 0.1 mg. of aluminum is detected in the cold; 0.05 mg. upon warming, with naphthazarin, 0.05 mg. of aluminum in the cold in 15 minutes. In the presence of a five fold quantity of zinc, there may be detected only 0.5 mg. of aluminum in the cold; 0.1 mg. by heating with alkannin and 0.5 mg. in the cold with naphthazarin.—J. V. DUBSKÝ and E. WAGNER. *Mikrochem.*, 17 (1935), 186. (L. L. M.)

Mardulcan—Determination of Iron in The iron is present as colloidal ferric hydroxide mixed with sugar and alkali. The preparation is required to contain 0.21% iron but no assay is prescribed. The following assay is proposed: 20 Gm. of Mardulcan is warmed with 10 Gm. of diluted sulphuric acid in an Erlenmeyer flask until the red-brown color is changed to a bright yellow. Traces of ferrous sulphate which may be present are converted into ferric sulphate by treatment with a few drops of 0.5% potassium permanganate solution. After cooling, the solution is mixed with 2 Gm. of potassium iodide and allowed to stand for one hour. The liberated iodine is titrated with N/10 sodium thiosulphate. If 0.21% iron is present 20 Gm. of Mardulcan will require 7.53 cc. of N/10 sodium thiosulphate.—G. MEYER. *Pharm. Ztg.*, 80 (1935), 324. (G. E. C.)

Medicinal Products—Study of the Alteration of, by pH Determinations A pH study was made of the following: distilled water, emetine hydrochloride solution (0.1%), morphine hydrochloride solution (2%), pilocarpine hydrochloride solution (0.1%), strychnine sulphate solution (0.1%), stovaine hydrochloride solution (5%), novocaine hydrochloride solution (2%), citrate of magnesia, Fowler's solution, sodium bicarbonate solution (1%), infusions and decoctions, syrups, sodium phosphate solutions, silver nitrate solutions and aspirin, thiocol, neosalvarsan and phenol solutions. The preparations were allowed to stand for 1 year and pH determinations were made from time to time. The changes noted are tabulated. The authors suggest that a pH determination should be a part of every assay of preparations.—A. IONESCU MATIU and M. SANDOVICI. *J. Pharm. chim.*, 21 (1935), 337. (M. M. Z.)

Morphine—Colorimetric Microdeterminations of, in Opium and Its Preparations Tincture of Laudanum and Syrup of Morphine Hydrochloride. The author gives the official method

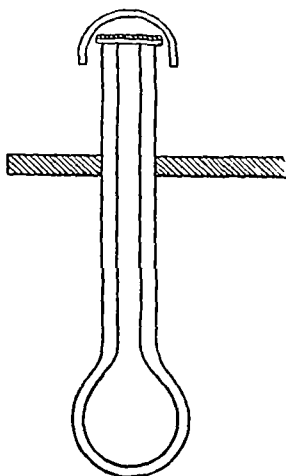
for isolating morphine from its preparations by use of slaked lime, dilute hydrochloric acid and ammonia. The microdetermination suggested follows: Into 10 colorimetric tubes are introduced, respectively, from 1 to 10 cc of morphine hydrochloride solution (1:10,000) and 1 cc of Wavelet's reagent (140 Gm sodium carbonate and 20 Gm disodium phosphate dissolved in 500 cc distilled water plus 70 Gm of recently dried molybdic acid and 200 Gm of tartaric acid, and the mixture diluted to 1 liter). To each tube is then added 1 drop of nitric acid. This is permitted to stand for 10 minutes, agitated and diluted to an even level in each tube. Finally 20 drops of ammonia water are added to each tube and mixed, when a blue color is obtained the intensity of the color being proportional to the amount of alkaloid present. This is used as a standard, and 6 tubes are used for the sample in the same manner. The method cannot be used if adrenaline is present, as it gives an identical color.—JUAN A. SANCHEZ *J. pharm. chim.*, 21 (1935), 366 (M. M. Z.)

Morphine—Estimation of, in Opium. The author describes a method for the determination of morphine in opium and opium preparations in which the alkaloid is shaken out. The material is prepared with sodium hydroxide and a solution of sodium plumbate added. After filtering, the excess lead is precipitated from an aliquot portion with sulphuric acid and again filtered. The sulphuric acid in the filtrate is neutralized, a definite acidity then being obtained by the addition of a small quantity of hydrochloric acid. The solution is then concentrated, made alkaline with sodium hydroxide and the other associated alkaloids shaken out with chloroform. The chloroform solutions are freed of any morphine with dilute sodium hydroxide. After combining the sodium hydroxide solutions they are made weakly acid by the addition of hydrochloric acid, chloroform isopropyl alcohol is added and the hydrochloric acid is neutralized with a quantity of sodium bicarbonate sufficient to cause the free alkaloid to go over into the chloroform mixture. After evaporation of the solvent the alkaloid is titrated.—F. SZEGHÖ *Ber. Ungar. Ph. Ges.* (1935) 316, through *Pharm. Weekblad*, 72 (1935) 517 (E. H. W.)

Morphine—Reaction for, in Papaverine Hydrochloride. The iodine liberated from iodic acid in testing for morphine in papaverine hydrochloride cannot be shaken out with chloroform. This is due to the fact that papaverine hydrochloride is easily soluble in chloroform. It is, however, only slightly soluble in carbon tetrachloride and carbon disulphide. A small quantity of iodine was dissolved in chloroform, carbon tetrachloride and carbon disulphide and 50 mg of papaverine hydrochloride added to each. The chloroform solution became lighter and finally changed to yellow or reddish yellow while no change occurred in the other solutions. Fifty mg of papaverine hydrochloride were added to three test-tubes containing a water solution of iodine (+ potassium iodide) (+ a few drops of dilute sulphuric acid). The brownish red cloudy precipitate due to the iodine-papaverine compound resulted. The aqueous solutions were then shaken out, one with chloroform, one with carbon tetrachloride and one with carbon disulphide. The precipitate dissolved in the chloroform imparting a yellowish color. The carbon tetrachloride and the carbon disulphide became reddish violet. Subsequent addition of potassium iodate to each tube resulted in no change in the chloroform and a deep violet in the carbon tetrachloride and the carbon disulphide. The author suggests that carbon tetrachloride or better carbon disulphide be substituted for chloroform in this test.—J. ROZEBOOM *Pharm. Weekblad* 72 (1935), 498 (E. H. W.)

Ointment of Mercuric Nitrate, Strong—Assay of. The authors tried the procedures suggested by other workers and found that none of them gave results higher than those obtained by the method of the Brit. Phar. 1932. They recommend the following modification of the official process, using a volumetric determination of the mercury instead of the gravimetric determination as the sulphide. Take about 5 Gm, accurately weighed, in a long-necked flask of about 250 cc capacity. Add 35 cc of sulphuric acid and heat cautiously until the mixture darkens. Add gradually 5 cc of fuming nitric acid, rotating the flask to assist the escape of evolved gases. Heat and maintain just below the boiling point. Repeat several times the addition of fuming nitric acid and the heating, until an almost colorless solution remains. Cool, add a slight excess of solution of potassium permanganate and heat to boiling. Add sufficient solution of hydrogen peroxide to make the solution colorless, cool and dilute to 250 cc. Titrate 100 cc with 0.1N ammonium thiocyanate using solution of ferric ammonium sulphate as indicator. The treatment with permanganate is carried out to remove the color from the solution and to thus aid in obtaining a sharp end point in the titration.—C. H. HAMPSHIRE and G. R. PAGE *Quart. J. Pharm. Pharmacol.* 8 (1935), 75-80 (S. W. G.)

Organic Compounds—Detection of, by Means of Spot Reactions IX. (1) **Detection of Acetic Acid by Formation of Indigo** (2) **Detection of Methyl Ketones by Conversion to Indigo Dyes** The method for the detection of acetic acid is as follows A drop of the test solution is evaporated to dryness with calcium carbonate and the dried residue is transferred to the small fusion tube illustrated in the diagram The conversion of the acid to calcium acetate may be effected also by direct evaporation in this tube under reduced pressure In the former case the solid samples to be tested may be placed directly in the tube with a quantity of calcium oxide and calcium carbonate The open end of the tube is covered with a small filter disk moistened with a freshly prepared solution of *o* nitrobenzaldehyde (saturated solution in 2*N* sodium hydroxide) The tube is supported in an asbestos plate as shown and gradually heated According to the quantity of acetone formed the filter paper, after an intermediate browning, becomes colored blue or blue green With small quantities of acetate, it is advisable to moisten the filter disk after distillation with a drop of diluted hydrochloric acid to remove the yellow color of the indicator and thus permit the blue color to come into prominence The method is applicable to the detection of the acetyl residue in organic compounds The limit of sensitivity is 60γ acetic acid *Test for Methyl Ketones*—A drop of the test solution, as nearly alcohol free as possible, is warmed gently in a micro eprouvette on a water-bath with a drop of alkaline *o* nitrobenzaldehyde solution (saturated solution in 2*N* sodium hydroxide) and, after cooling is shaken with chloroform Methyl



ketones are indicated by a bluing of the chloroform layer With alcoholic solutions a red instead of blue coloration is sometimes observed The reaction detects 100γ acetone 150γ methyl ethyl ketone 150γ methyl heptenone 50γ acetophenone, 200γ acetyl acetone 40γ diacetyl 300γ acetoacetic ester, 100γ acetaldehyde —F FEIGL R ZAPPERT and S VASQUEZ *Mikrochem*, 17 (1935), 165 (L L M)

Pepsin—Assay Processes and Stability of Commercial

The samples of commercial pepsins examined were found to conform with their stated values The Brit Phar, U S Phar D A B and edistin methods of assay are compared Suggested improvements in the Brit Phar process are (1) Substitution of a wire sieve for the hair sieve (2) Allow only 15 minutes for dissolving the pepsin (3) Digest for 3 hours instead of 6 hours, using a larger quantity of pepsin and shaking every 10 minutes (4) The tolerated amount of albumen remaining undigested should be accurately described (5) Digest at 50–52° C (6) Define the hydrochloric acid in terms of normality The author suggests the adoption of the U S Phar procedure with the following modifications (1) To disintegrate the albumen

‘Rub 10 Gm of the prepared egg white gently in a small glass mortar with 10 cc of the diluted hydrochloric acid and, when thoroughly distributed, transfer to the digestion bottle with a glass rod, wash the pestle and mortar and the glass rod with further quantities of 10 5, 5 5 cc of diluted hydrochloric acid, in this way transferring every particle of albumen to the digestion bottle’ (2) 0.2 Gm of the pepsin to be weighed out and made up to 300 cc with acid to form the test solution The value of carrying out at least 6 tests with each sample or using a standard pepsin is stressed —KENNETH BULLOCK *Quart J Pharm Pharmacol* 8 (1935), 13–30 (S W G)

Pharmacopœial Tests—Notes on Some II Chiniofon, Codeine, Simple Solution of

Iodine, Sodium Phosphate Assay of Chiniofon—The following procedure was adopted for the determination of iodine Mix about 0.2 Gm, accurately weighed with about 1 Gm of anhydrous sodium carbonate in a nickel crucible 20 mm in diameter, moisten with water, and dry at 100° Fill the crucible completely with anhydrous sodium carbonate well pressed down, invert the crucible and contents in a nickel crucible, 25 mm in diameter containing a layer of anhydrous sodium carbonate and add more anhydrous sodium carbonate to seal the junction of the two crucibles Heat for 15 minutes over a Bunsen flame in such a manner that the outer crucible is a uniform dull red, allow to cool, and dissolve the residue in 100 cc of hot water, filter, and wash the filter with water until the washings are neutral to litmus Allow the solution to cool and add sufficient

water to produce about 500 cc. Neutralize the solution with a mixture of equal volumes of sulphuric acid and water using methyl orange as indicator. Add 1 cc. of sulphuric acid (1:1), 0.2 cc. of bromine and about 0.05 Gm. of marble and boil briskly for 10 minutes. Allow to cool, add 0.2 cc. of a 25% w/v solution of phenol in glacial acetic acid and allow to stand for at least 2 minutes. Add 2 Gm. of potassium iodide and titrate with *N*/10 sodium thiosulphate using mucilage of starch as indicator. Each cc. of *N*/10 sodium thiosulphate = 0.002115 Gm. of iodine.

Determination of Sodium Bicarbonate—Place about 0.5 Gm., accurately weighed, in a dry test-tube 150 mm. in length and 20 mm. in diameter and insert a loose plug of glass wool about half way down the tube. Place the test tube in a 750 cc. filtering flask containing 50 cc. of *N*/10 barium hydroxide. Close the neck of the flask with a stopper, through which passes the tube of a 50-cc. separating funnel, in such a manner that the tube of the separator enters the test tube. Exhaust the flask rapidly until a pressure of 20 mm. of mercury is obtained, and close the exit tube. From the separating funnel add gradually 10 cc. of freshly boiled and cooled water, and, when effervescence has ceased, about 1 cc. of dilute hydrochloric acid. Allow to stand for at least 12 hours, and titrate the excess of *N*/10 barium hydroxide with *N*/10 oxalic acid, using phenolphthalein as indicator. Each cc. of *N*/10 barium hydroxide = 0.0042 Gm. of sodium bicarbonate. Results of analyses of commercial samples are tabulated.

Solubility of Codeine in Ether—The solubility of codeine monohydrate in ether as stated in the literature is noted. The official alkaloid, containing one molecule of water of crystallization, was found to dissolve 1 Gm. in approximately 75 Gm. of ether. The saturated solution had a specific gravity of 0.728.

Changes in Simple Solution of Iodine on Storage—The following conclusions are stated. When simple solution of iodine is stored the content of free iodine becomes constant in 8 months. The acidity of the solution still increases slightly after the free iodine content has become constant. The rate of chemical change and the composition of the final equilibrium mixture are not appreciably affected by light. The results are tabulated.

Detection of Traces of Sodium Fluoride in Sodium Phosphate—The following procedure was adopted. Dissolve 2 Gm. of the sodium phosphate in 20 cc. of water, add 5 cc. of acetic acid and 3 cc. of solution of calcium chloride and set aside for 1 hour, no turbidity is produced. The test will detect 0.2% of sodium fluoride in sodium phosphate. Other tests were tried, but none were more sensitive.—G. R. PAGE *Quart. J. Pharm. Pharmacol.*, 8 (1935), 81-89 (S. W. G.)

Potassium Ferrocyanide—Toxicologic Study of, as a Clarifier for White Wines Toxicologic procedures were applied to the detection of cyanide derivatives in wines that had been clarified by means of potassium ferrocyanide. The results obtained indicate that the question is open to further investigation.—CHILLE, DUBAQUIÉ and TURBET *Bull. soc. pharm. Bordeaux*, 73 (1935), 9-42 (S. W. G.)

Purine Preparations—Cobalt Nitrate as a Reagent for Pharmaceutical A 3% alkaline solution of cobalt nitrate is recommended as a reagent for identifying theobromine, theophylline, caffeine and such combinations as diuretin and caffeine tartrate. Directions are given for performing the test.—R. KLIMEK *Wiadomosci Farm.*, 61 (1934), 619, through *Chem. Abstr.*, 29 (1935), 3115

Pyrimidon—Coloring of, by Certain Oxidants Pyrimidon is very sensitive toward the influence of oxidizing agents, often resulting in highly colored compounds. The urine of persons who have taken pyrimidon is frequently colored red or light purple due to the oxidation of the pyrimidon. The obtaining of beautifully colored oxidation products is largely dependent upon the type of oxidizing agent present. Many gums give a light purple color due to the oxidases they contain. Blood gives a similar reaction. Ferric chloride reacts quantitatively. Silver nitrate gives a purple reaction accompanied by the reduction of the silver nitrate to metallic silver. Nitrites in sulphuric acid also give a color reaction. In many cases, however, if the oxidation is allowed to continue the colorless dioxypyrimidon results. An extraordinarily beautiful color is obtained when potassium persulphate is employed as the oxidizing agent. The reaction takes place in the cold and only after a long time does the color change to red and finally disappear. By means of this reaction small quantities of pyrimidon may be detected in antipyrine. The reaction works well on a slide. A small quantity of the material is suspended in a drop of water and a few small crystals of potassium persulphate added. In the presence of pyrimidon the crystals quickly surround themselves with a zone of purple. 0.5% of pyrimidon may thus be detected in antipyrine.—M. WAGENAAR *Pharm. Weekblad*, 72 (1935), 564 (E. H. W.)

Rauch-Schnee are small, white, odorless and tasteless tablets used for practical jokes. A tablet inserted in a cigarette or cigar produces by the glowing flame snow like flakes in the air. Chemical investigations reveal it to be identical with a substance commercially known as metaldehyde, a polymer of acetaldehyde. Physiologically, it is stronger than paraldehyde in action.—H SOMMER *Pharm Zentralh*, 76 (1935), 150 (E V S)

Sugars—Chemical Methods for Reducing Comparison of Values for copper dextrose equivalents as determined by titration of the copper with thiosulphate and by titration with dichromate using ortho phenanthroline as a colorimetric indicator (a modification of the Jackson Matthews electrometric method) respectively when compared with the Munson and Walker table values, showed good agreement except at higher concentrations of dextrose.—R F JACKSON and EMMA J McDONALD *J Assoc Official Agr Chem* 18 (1935), 172 (G S W)

Thallium—The Detection of Alkaloidal Reagents VII Being monovalent and trivalent, thallium forms two series of compounds. In general the thallic compounds are unstable. Commercial thallium compounds used for cosmetics, medicinal and rodenticidal purposes are almost entirely thallic. In the flame, compounds dissociate, liberating thallium which gives a characteristic green color and spectrum and if the flame strikes a cold surface a brown mirror is formed. In the Marsh apparatus the stain is similar to that produced by arsenic but it gives a yellow color with iodine and is insoluble in ammonium sulphide. Spectroscopic studies show characteristic lines. A detailed search of the literature has been made and the more promising reactions have been studied. Detailed results are arranged in two tables, one for thallic and one for thallic. These tables show reagent, color of solution, color of precipitate, precipitation threshold, mg Tl/cc and literature references. Ninety reagents were tried. An extensive list of references is appended.—JAMES C MUNCH and JUSTUS C WARD *J Am Pharm Assoc* 24 (1935), 351 (Z M C)

TOXICOLOGICAL CHEMISTRY

Arsenic—Triple Poisoning by A detailed description and discussion of 3 cases. In the first, the subject survived administration of repeated doses extending from Dec 26 1929, to Feb 1, 1930, it led to suspicions being aroused in previous deaths and examination in Feb 1930 of two corpses buried in 1922 and 1929 respectively, clearly revealed the presence of arsenic in quantities sufficient, when taken in connection with the known clinical history of the cases to furnish proof of death by arsenic poisoning.—FONZES DIACON, GRYNFELTT, RIMBAUD and CAVA LIÉ *Ann Med Legale Criminol Police Sci*, 15 (1935), 28-52 (A P C)

Thallium—Two Cases of Murder by Two cases are described in which death of a 48 year old woman and a 40 year old man respectively was produced by 1 to 3 tubes of Zeliopasta (a rat poison) containing 0.909 to 2.728 Gm of thallium sulphate. Autopsy revealed in both cases the presence of thallium, estimated at 1.6215 Gm of the sulphate in the body of the woman and 1.332 Gm in the body of the man. It is concluded that gastrointestinal with polyneuritic symptoms and trophic disturbances of the hair should lead to a suspicion of thallium poisoning, and that it would appear as if the medicament preserved the body.—H KRSEK *Cas Lek Cesk*, 14 (1934) 40, through *Medico Legal Criminol Rev*, 2 (1934), 372 (A P-C)

PHARMACOGNOSY

VEGETABLE DRUGS

Drugs—Brazilian, in World Commerce The author discusses drugs derived from the Brazilian flora. Many hundreds are used domestically but only a few are exported. Among the latter the most important are *Anda-Assu* (*Euphorbiaceae*) yielding an oil similar to castor oil, having laxative properties. *Araoba* (*Papilionaceae*) in the form of Goa powder and used principally for the production of chrysarobin. *Canella*. Several Brazilian trees are called by this name, the exported bark however being that of *Nectandra amara*. *Copaiba Balsam*. This is yielded by several trees, the exported product often being a mixture derived from several sources. Mixing is usually done in the city of Obidos. *Elemi*. Several resins are known by this name among them the true elemi (*Bursera leptophloeos*) hard elemi (*Protium sp*) and bastard elemi, a yellow elemi coming from the *Gutierrezia*. *Guarana* is prepared from the seeds of *Paullinia sorbilis*. About 1200 to 1500 Kg are used for domestic pharmaceutical purposes and about 15 000 go into the manu-

facture of refreshing drinks *Ipecac* Both the true root (*Uragoga Ipecacuanha*) and that of *Richardsonia brasiliensis* are gathered These are closely related plants *Jaborandi* is yielded by *J. jaborandi* *J. pinnatifolius* and *J. spicatus* *Kopal* Most of the Brazilian *kopal* is exported to North America *Koto* The name signifies anti diarrhoea which fact probably accounts for the appearance of several barks on the market The true bark comes from *Ocotea argyrophylla*, *Nectandra elaeophora* and *Bracteanthus glycyarpus* *Marapuama* the source of which are members of the Genus *Ptychopetalum* (*Oleaceae*) The extract of the root and stem bark has recently been shown to be beneficial in hookworm treatment Most of it is exported to Argentina and Japan *Sandal Oil* This is not an official oil but considerable quantities are produced, some 12,000 Kg being used in the perfume industry *Tayuyi* under which name are known several roots of plants belonging to the Genus *Trianosperma* (*Cucurbitaceae*) used as antisiphilotics The fatty oil of these plants is a laxative *Tonka Beans* Five varieties are known but only two *Diplerix odorata* and *D. polyphylla* are used for the production of coumarin, the others being used for fixed oil—FRED W FREISE *Der Tropenpflanzer* (1934) 469 through *Pharm Weekblad*, 72 (1935), 470 (E H W)

Ergot—Russian All published information about Russian ergot has been about commercial supplies which are usually in a damp and moldy condition In the fall of 1934, a number of specimens, cured as our Pharmacopœia specifies were received directly from Russia Differences observed among the samples were of minor importance The important question of differences relates to the color of the fractured surface That of Spanish ergot is white Food and drug officials have discontinued admission of damaged ergot with pink fracture How Russian ergot of commerce came to be changed can only be conjectured In the author's opinion somewhere from producer to importer it has been moistened to increase its weight Aside from fracture color and odor official ergot shows little difference from that of Spain and Portugal Externally it is not quite so dark In general the grains are a little smaller and more slender A table shows the sizes A striking difference shows in the powders the Russian powder being blackish the Spanish light brown The following conclusions seem clearly established 1 The normal fracture color of all ergot is white 2 The purple fracture color that has been commonly seen in Russian ergot is the result of decomposition caused by exposure to dampness and resulting putridity 3 The specification by the U S P Revision Committee of pink color in the fracture of ergot is the result of the former prevalence in our drug market of such decomposed ergot 4 At the present time, the Russian ergot in the American market is in general of sound quality and exhibits a white fracture color 5 All reference to pink fracture should be eliminated from the U S P description of ergot 6 Whatever method of bio assay may be adopted should be based on tests made with ergot of white fracture Tests that have been made with the deteriorated ergot of pink fracture should be scrapped All the specimens have been preserved and may be seen at the New York College of Pharmacy and also a sample of that now on the market in New York—H H RUSBY *J Am Pharm Assoc*, 24 (1935), 382 (Z M C)

Plantago—Botanical Sources of Drugs Derived from the Genus The literature dealing with the *Plantago* species is briefly reviewed and anatomical differences are illustrated All commercial samples of *Ispaghula* were found to consist entirely of *P. ovata* Forsk no seeds of *P. amplexicaulis* being found Commercial samples of *Psyllium* may consist of *P. arenaaria* or *P. lanceolata* in addition to *P. psyllium* No *P. Cynops* seeds were found in the 'Psyllium' examined Bartung or 'Barhand' consists of seeds of *P. major* and is widely used in the East—E W SKYRME *Quart J Pharm Pharmacol* 8 (1935), 1-12 (S W G)

Strophanthus Emuni—Seeds of The seeds of *S. emuni* are apparently similar in their pharmacological action to those of *S. kombe* and the tincture and mixture of glycosidal principles obtained from them also appear to be similar pharmacologically and chemically The inclusion of *S. emuni* in the Brit Phar is recommended Reports of chemical pharmacological and clinical tests are given—BRITISH PHARMACOPŒIA COMMISSION *Quart J Pharm Pharmacol*, 8 (1935), 61-70 (S W G)

Tree Barks—Hygroscopicity of With regard to the sorption of moisture the air dry barks of *Cinchona succiruba*, toon (*Cedrela toona*), jaman (*Eugenia, jambolana*) and mango (*Mangifera indica*) are similar to wood The maximum sorption at saturation humidity was 22-28% The results were not affected appreciably either by presoaking the bark or by drying it to constant weight at 100° The moisture content of barks should be determined before they are used in the

preparation of extracts and tinctures—S N KAPUR and D NARAYANAMURTI *Indian Forester*, 60 (1934), 702, through *Chem Abstracts*, 29 (1935), 3463

PHARMACY

GALENICAL

Distilled Water, Sterile—Preparation of, in a Vacuum If a water which is in itself nearly germ free, is distilled in a sterilized apparatus under reduced pressure and at only 48°, the distillate will be sterile. If, however, a contaminated water is used, some organisms will be found in the distillate. The construction of the apparatus has some bearing upon the sterility of the distillate under reduced pressure. The arrangement must be such as to prevent drops of contaminated water from being carried over mechanically. The "Sikotop" apparatus either with or without vacuum produces a distilled water meeting the chemical tests of the Swiss Phar V, but one which cannot be relied upon to be sterile if reduced pressure is used. The apparatus described by Vuillemin will produce a chemically pure and at the same time sterile water at ordinary temperature at a very low cost—J THOMANN and A KALIN *Pharm Acta Helv*, 10, (1935), 96

(M F W D)

Fluidextract of Thyme and Its Preparations Studies were made in which 1 Kg of drug was moistened with 50 Gm glycerin 75 Gm alcohol and 150 Gm water and then percolated, and the pH , dry weight (according to Peyer) and thymol content were determined. The following extracts were prepared (1) with 70% alcohol—bright brown, clear, transparent, remained clear on standing, pH 5.18, dry weight 1.49, thymol 0.0524%, slight turbidity with 5 parts of water. The syrup with 5% extract is clear, weakly opalescent, bright brown, has a distinct thymol taste, pH 5.20, with 10% extract it is more strongly opalescent, no sediment after long standing (1a) An extract prepared according to the D A B VI by the addition of ammonia water and after filtering was dark brown, not transparent, deposit formed after 3 days, pH 8.86, dry weight 10.12, clear with 5 parts of water, thymol content 0.0475%, 10% syrup was clear, pH 5.8, thyme taste weaker than (1) (1b) An extract prepared by adding 20 Gm to the moistening liquid was green brown, turbid, deposited greatly pH 8.5, dry weight 10.1%, turbid with 5 parts of water, green flakes separating thymol content 0.0503. The 10% syrup was green and turbid separated into 2 layers (a clear brown layer and an upper green turbid one) pH 8.01 (3) An extract prepared by moistening the drug with ammonia water and then percolating with a mixture of 340 Gm of alcohol and 660 Gm of water had a dark brown color and was clear. After standing it formed a slight sediment, pH 5.5–6.71, dry weight 14.1, thymol content 0.0321%, clear with 5 parts of water and yielded a 10% syrup with pH 5.71 (4) An extract prepared by moistening the drug with a menstruum omitting the ammonia water and then percolating was clear with a red brown color, pH and had 5.21, dry weight 14.1% thymol 0.0330%, clear with 5 parts of water, the 10% syrup was clear and had pH 5.20. The syrups from (3) and (4) were much darker than those from (1) and (1a) but did not have the characteristic taste of thyme drugs (4a) Extract (4) was treated with ammonia according to the D A B, filtered and the filtrate had a dry weight of 12.2% and a thymol content of 0.0302%. The residue on the filter was dried, partially dissolved in cold water, yielding a slightly turbid solution with boiling water and gave a test for thymol indicating that not only coloring matter but also active constituents were precipitated (5) The preparation made according to the Swiss Phar yielded a fluidextract which was at first turbid and then settled pH 5.2, after neutralization 5.7, dry residue before filtering 16.11%, after filtration 14.8%, thymol content before filtration 0.032% and after filtration 0.031%, clear with 5 parts of water, the 10% syrup had a pH 5.41—W BRANDRUP *Apoth Ztg*, 50 (1935), 293–294

(H M B)

Hydrogen Peroxide—Stabilization of, Especially by Acetanilid Höll finds that 3.1% hydrogen peroxide solution stabilized with 0.1% acetanilid was almost unchanged (3.05%) after 1/2 year, 2.9% after 1 year. A 15.15% solution after 4 months contained 14.3% hydrogen peroxide and after 6 months 13.8%, without preservative it contained after 6 months 6.3%. However, acetanilid is decomposed in a short time by water giving nitrobenzene which is recognized by its odor and by the usual tests. The change occurs in the 3% solution in 1–2 months and in the stronger solution in a few weeks. Since the nitrobenzene is a poison acetanilid should not be used. Phenacetin is not decomposed at ordinary temperature even after many months by concen-

trated hydrogen peroxide solutions and a 15.2% solution treated with 0.05% phenacetin contained 14.5% hydrogen peroxide after 4 months. The stabilizing action of luminal, veronal, salicylic acid and sodium hypophosphite is much less. Experiments show that Nipagin M (0.1%) is the best of all stabilizers since 3% solutions showed no change after 4 months and 15.2% solution decreased to 14.8%. —*Apoth. Ztg.*, 50 (1935), 252 (H. M. B.)

Lugol's Solution The following formula is suggested as a uniform standard. Potassium iodide 2 Gm, iodine 1 Gm and water 20 cc —E. BOLTANSKI, *Presse med.*, 43 (1935), 292, through *Chem. Abstracts*, 29 (1935), 3464.

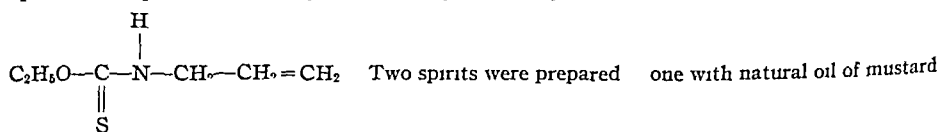
Ointments—Structure of Ointments can be classified as fatty waterless (I), fatty aqueous (II) and those containing no greasy substances (III). I form complicated multiphase systems when mixed with solid drugs. Pharmacologically they are protective salves, being impermeable to water and having a cumulative but slow action. II act much more strongly than I and may consist of an emulsion of oil in water or of water in oil or a mixture of an ointment and an emulsion. Pharmacologically they exert a cooling action as do also "quasi emulsions" obtained by addition of water to a solidifying fat. III are composed of swollen lyophilic colloids containing various drugs in a dispersed state —M. GATTI, KOSTIAL and B. KAMIENSKI, *Wiadomosci Farm.*, 61 (1934), 711, through *Chem. Abstr.*, 29 (1935), 3115.

p_H —Pharmaceutical Study of The paper first considers formulation of p_H , showing how equilibrium exists, the small extent to which water dissociates, that pure water or a neutral aqueous solution is a 1/10,000,000 normal solution of both H-ions and OH-ions. Formulation of buffer capacity is not discussed except to explain the unit adopted by Van Slyke which is the differential ratio $\frac{dB}{d(p_H)}$ and which is used in adjusting pharmaceutical preparations to specified p_H values.

The formulation of electrode potentials is discussed and the fundamental equation for converting electrode potentials to hydrogen-ion concentrations given. The history of methods is traced with references to a number of men and the contributions they have made. Most drugs can be put into two groups: those having maximum stability at p_H 7 and those having maximum stability very near p_H 5. Stability in absence of acidity or alkalinity is easily understood but stability at p_H 5 must be explained on the basis of hydrogen ion catalysis. Thus the author does. Bronsted has developed a mathematical conception of hydrogen-ion concentration and a new definition of acids and bases. Though electrolytes exert considerable influence upon both the p_H and the stability of solutions, the fundamental effect is not understood. Electrolytes that increase acidity of acid solutions are named. Sulphates decrease it. The action of univalent or bivalent cations is mentioned. Under the heading "physiological p_H ," the reaction of distilled water is discussed, the difficulty attached to getting it and keeping it near p_H 7 even when stored in Jena ampuls. Fleisch's method for preparing a stable nutritive solution of physiological p_H is given. A number of other solutions are discussed. Sterilization of cocaine hydrochloride increases acidity but if buffered to a weakly acid reaction by Na_2CO_3 and NaH_2PO_4 or $NaH_2P_2O_4$ and Na_2HPO_4 , the p_H will remain stable during sterilization. Solutions of procaine hydrochloride can be stabilized in a similar manner. Morphine hydrochloride, novocaine, stovaine and atropine sulphate, benzyl alcohol, strophanthin, all call for special treatment. Previous workers have reported the change in p_H by sterilization of the following pharmaceutical products: dextrose, glycerophosphate compound, magnesium sulphate, physiological salt solution, procaine, procaine and epinephrine, all more acid, iron cacodylate less acid, mercurochrome, sodium salicylate, more alkaline, no change in sodium cacodylate, sodium iodide and salicylates with colchicine. A general method suggested by Robertson and others, for maintaining stable p_H during sterilization and which will remain stable for 2-3 weeks is given in detail. In ophthalmic therapy the adjustment of p_H is of considerable importance. The results of an investigation by Gifford and Denton are summarized. Since lacrimal secretions are about p_H 8, an acid buffer solution is prepared from boric acid and potassium chloride, so as to have a p_H of 5.5. An alkaline buffer solution which is less irritating and more suitable for atropine homatropine, physostigmine and pilocarpine is prepared by adding 0.20M solution of sodium carbonate to the acid buffer solution. How to handle phenacine, atropine, homatropine, physostigmine, pilocarpine, zinc sulphate, sodium fluorescein, metaphen and butyn is reported. A table of p_H values for ophthalmic preparations determined by Gifford and Denton is given. The relation of p_H and toxicity is discussed with reference to alkaloids. Crane's statement that the toxicity of alkaloidal salts is dependent

upon the degree of hydrolysis is explained. Hydrolysis curves are shown and a table comparing p_H and percentage of hydrolysis. Mayeda used cinchona alkaloids to verify his mathematical results and concluded that "the biological action of cinchona alkaloids is dependent entirely upon the amount of alkaloidal base freed by hydrolytic dissociation which in turn is a function of the p_H and only the free quinine base is the bearer of biological action." In general, experimental work with alkaloidal salts used as local anesthetics indicated increased biological activity when a greater amount of alkaloidal base is freed by dissociation. Considerable work has been done on the effect of p_H on the germicidal action of soaps. Preservative action of acids and bases is largely a function of hydrogen and hydroxyl ion activity. It has been concluded that undissociated weak acids rather than the ions are the preservative agents and this agrees with the statement that undissociated molecules penetrate into protoplasm more readily than ions do. Preservatives in pharmaceutical preparations have been studied by a number of people and reports made for lactic acid, sugar, salt. Insulin itself has a toxic effect. Attention is directed to the reports about the influence of p_H upon mercuric chloride solutions, upon the antiseptic actions of phenyl substituted acids from benzoic to ϵ -phenyl caproic upon potassium iodide and sodium iodide solutions. Tscherch and Fluck investigated the instability caused by acacia. They found that it could be rendered inactive. Work by Krantz and associates is also reported. The stability of gelatin emulsions according to Friedman and Evans is dependent upon the p_H . Enz and Jordan investigating emulsification of alkaloid containing preparations found that the statement that "emulsions are less apt to form in strongly acid or alkaline solutions than those which are neutral" is true only in specific instances. Numerous pharmaceutical colloids represent the two practical classes. Bogue showed that physical properties of colloids were a minimum at a p_H corresponding to the isoelectric point. Tyndall and Kraemer carried this study further. Considering p_H and stability of complex products of biological origin the author discusses proteins most of which do not require stabilization but general principles concerning their decomposition can be applied to the problem of stabilizing toxins, antitoxins and insulin. Reference is made to Northrop's work on gelatin, Svedberg's and associates on proteins in general, egg albumen, hemocyanin, other workers on the hydrolysis of casein in acid solution, the stability of toxins and lysins, tetanolysin, cithins and cholesterins. Studies on hormones are cited. Experimental work on the stability of vitamins is shown by a table giving temperatures, time in hours, p_H and percentage of decomposition. The relation of activity of enzymes and p_H are not considered except to give a number of references. Each enzyme has an optimum p_H and changes in activity with changes in p_H are related to the state of ionization of the substrate and the enzyme. Pepsin and trypsin are briefly considered.—FREDERICK F JOHNSON, *J Am Pharm Assoc*, 24 (1935), 397 (Z M C)

Spiritus Sinapis Swiss Phar V—Stability of Allylthiocyanate the active ingredient of *Spiritus Sinapis*, reacts slowly on standing with ethyl alcohol to form allyloxythiourethane



and one with synthetic oil. Samples of each were stored at a temperature of 17° to 19° in daylight and in the dark. The allylthiocyanate was determined on the day of preparation by the iodometric method of the Swiss Phar V. However, this method determined not only allylthiocyanate but also allyloxythiourethane. To obviate this difficulty, advantage was taken of the fact that the latter compound adds iodine directly in acid solution while the former requires an ammoniacal medium. By subtracting the number of cc of 0.1N iodine used by the allyloxythiourethane from the total number used in the determination of the allylthiocyanate plus allyloxythiourethane, the amount of unaltered allylthiocyanate was determined. The four preparations were all assayed on the same days. The results were tabulated for a period of 247 days and they showed that *Spiritus Sinapis* must be freshly prepared as the pharmacopœia requires. Allyloxythiourethane, as a rubefacient, is valueless as a comparison of the therapeutic activity of a fresh and an old spirit showed. The stability is little affected whether natural or synthetic oil is used or whether the spirit is stored in the light or dark. The monograph of the Swiss Phar should contain a qualitative test for the presence of allyloxythiourethane.—J BUCHI, *Pharm Acta Helv*, 10 (1935) 90 (M F W D)

PHARMACEUTICAL ABSTRACTS

EDITOR A G DuMEZ, 32 S Greene Street, Baltimore, Maryland

ABSTRACTORS

WILLIAM B BAKER
JOHN C BAUER
GERSTON BRUCH
ARTHUR H BRYAN
HENRY M BURLAGE
ALBERT H CLARK
ZADA M COOPER
GUSTAV E CUALINA
AMELIA DeDOMINICIS
MELVIN F W DUNKER
GEORGE W FIERO
PERRY A FOOTE
RALPH R FORAN
SAMUEL W GOLDSTEIN
H B HAAG
G W HARGREAVES
WILLIAM H HUNT

CASIMER T ICHNIOWSKI
ROLAND E KREMERS
CLIFFORD S LEONARD
L LAVAN MANCHEY
ARTHUR E MEYER
A PAPINEAU-COUTURE
HARRY ROSEN
A S SCHWARTZMAN
EMANUEL V SHULMAN
EDGAR B STARKEY
MARVIN R THOMPSON
E G VANDEN BOSCHE
GLENN S WEILAND
ANNA E WHITE
ELMER H WIRTH
THOMAS G WRIGHT
MAX M ZERVITZ

CONTENTS

Pharmacy

Pharmacopœias and Formularies	178
Non Official Formulæ	178
Dispensing	179
Pharmaceutical History	181
Pharmaceutical Education	181
Miscellaneous	182

Pharmacology, Toxicology and Therapeutics

Pharmacology	183
Toxicology	191
Therapeutics	192

New Remedies

Specialties	197
-------------	-----

Bacteriology

203

Botany

204

Chemistry

General and Physical	205
Inorganic	205
Organic	
Alkaloids	206
Essential Oils and Related Products	208
Fixed Oils, Fats and Waxes	209
Glycosides, Ferments and Carbohydrates	210
Other Plant Principles	210
Unclassified	211

Biochemistry

212

PHARMACY

PHARMACOPŒIAS AND FORMULARIES

British Pharmaceutical Codex 1934 An extensive review of the new Brit Phar Codex with detailed discussions of included material which has been developed in recent years. A list of specialties stating the composition, therapeutic usage, manufacturer and agent is given in the new Codex —MARG VAN HAUWAERT *J pharm Belg*, 17 (1935), 37, 61, 83, 98, 115, 169, 185, 203, 241, 261, 293, 307, 325 (S W G)

Homeopathic Dispensatory—New Methods of Preparation and Assay of The methods of preparing essences, tinctures, solutions, and powder dilutions of plants, animal products or minerals according to the homeopathic regulations are explained. The essences are prepared from the fresh plants. Plants free from camphor-like oils or resins are pressed until 60% of their sap is obtained, an equal volume of alcohol (90%) is added, and after standing for a period of time filtered. Plants yielding over 70% of sap are macerated for 14 days in alcohol (90%) equivalent in volume to sap content then pressed and filtered. Plants containing ethereal oil resins or camphors, and yielding less than 60% of sap are first tested for sap content, then sufficient alcohol is used to prepare the essence, usually a 1:3 dilution. The preparation of tinctures depends upon the nature of the drug. Fifty various types of tinctures are prepared from fresh animal material, the strength being 0.01 or 0.1. Acids are diluted ten times (D 1). Powder dilutions are prepared by repeated triturating and sieving of the materials. The diluents used are either aqueous or alcoholic media or milk sugar. The power of dilutions is indicated in tenths (D) or hundredths (C). The specific gravity and capillary analysis on filter paper or combined with luminescence analysis are also determined —KONRAD SCHULZE *Pharm Zentralk*, 76 (1935), 114 (E V S)

NON OFFICIAL FORMULÆ

Antacid Preparations Many of these preparations on the market are mixtures of soluble and insoluble alkaline salts with digestives such as pepsin, pancrease, diastase and flavored with peppermint, cinnamon, anise and menthol. The following are formulas of this type: (1) Precipitated calcium phosphate 9%, precipitated calcium carbonate 10%, magnesium oxide 20%, sodium bicarbonate 30%, bismuth subnitrate 20%, powdered sugar 20%, oil of peppermint 1%. Rub up the oil with the chalk and mix the rest of the ingredients with it thoroughly. (2) Magnesium oxide 25%, sodium carbonate 25%, sodium bicarbonate 25%, lactose 20%, pepsin 5%. (3) Bismuth subnitrate 15%, magnesium carbonate 20%, magnesium oxide 20%, sodium bicarbonate 19%, borax 3%, milk sugar 20%, pepsin 3%. (4) Sodium bicarbonate 20%, powdered ginger marc 3%, powdered rhubarb 5%, magnesium oxide 25%, magnesium carbonate 20%, bismuth subnitrate 20%, pepsin 2%, powdered sugar 10%. (5) Magnesium hydroxide 15%, magnesium oxide 15%, magnesium carbonate 15%, bismuth subnitrate 20%, sodium bicarbonate 13%, powdered sugar 20%, peppermint 2% —ANON *Drug and Cosmetic Ind*, 36 (1935) 550, 621 (H M B)

Cosmetic Formula Ingredients and method of manufacturing a hair oil formula of lanolin and mineral oil are cited —ANON *Arch Pharm og Chemi*, 42 (1935), 186 (C S L)

Hair Lotion The following composition is given: Alcohol 420, camphor 15, ammonia 22, oil of turpentine 40 and decoction of camomile 415 Gm —HENRI FAGNY *Fr Pat*, 776,966 (Feb 8 1935) (S W G)

Hair Tonics These preparations are divided into three classes: (1) those designed to prevent baldness, including those intended to "cure" baldness, (2) astringent intended to restrict excessive oiliness and scalp perspiration and (3) those designed to stimulate the scalp and dress the hair. No tonic is known which will prevent or cure baldness but in some cases can help to restore hair which is lost because of disease by killing bacteria on the scalp and by stimulating the circulation of the blood through the area. Stimulating tonics are also of value when baldness is caused by wearing excessively tight hats or by improper care of the scalp. Essentially most hair tonics consist of (a) solvents such as water, alcohol, glycerin, kerosene, chloroform, (b) counter irritants as cantharides, formic acid, capsicum, diethylphthalate, (c) conditioners as castor oil, sulphonated castor oil, (d) dandruff removers as quinine arsenite, potassium arsenite, potassium sulphate, (e) antiseptics as Fowler's solution, Carrel Dakin solution, formaldehyde, benzoic acid and its esters, phenol, resorcin, resorcin monoacetate etc. (f) foaming agents as saponin, powdered soap, tincture quillaja. (g) detergents as sodium lauryl sulphonate, sodium cetyl sulphonate, soap

sulphonated oils The following formulas are offered (1) Castor oil, odorless 18%, chloral hydrate 2%, alcohol 79.5%, perfume 0.5% Dissolve the chloral hydrate in the oil, add the perfume and alcohol, filter This is useful for dry hair and scalp and to impart a lustre to the hair (2) Potassium arsenite 0.2%, deodorized kerosene 74%, alcohol 20%, perfume 0.8% ethylene glycol 5% Dissolve the salt and perfume in the alcohol, add ethylene glycol and kerosene and mix This product is excellent for dandruff and should be dispensed with a 'shake' label (3) Fowler's solution 25%, alcohol 30%, glycerin 5%, saponin 0.5%, water 39%, perfume 0.5% Dissolve the saponin in a small amount of water, add glycerin and alcohol, mix add water and Fowler's solution This tonic is recommended as an antiseptic for treatment of dry scalp and dandruff and is a good dressing (4) Chlorothymol 0.1%, tincture of capsicum 4%, quinine arsenite 0.2%, alcohol 75%, castor oil 20%, perfume 0.7% Dissolve the chlorothymol and quinine salt in alcohol, add perfume, tincture and oil This tonic is an excellent antiseptic for dandruff and a good dressing (5) Tannic acid 4%, formaldehyde 0.2%, alcohol 60%, water 35%, perfume 0.8% Dissolve the acid in alcohol, add the other ingredients, mix and filter This is a good antiseptic astringent tonic for oily scalp and dandruff (6) Quinine arsenite 0.2%, tincture cinchona 10%, tincture quillaja 4%, quinine 0.5%, alcohol 60%, perfume 0.3%, water 25% Dissolve the quinine and its salt in alcohol add the remainder of the ingredients mix filter—*ANON Drug and Cosmetic Ind* 36 (1935) 553-554 (H M B)

Mouth-Wash Powders The powders contain a stabilized oxygen-yielding compound mixed with a silver-containing compound and preferably also an acid substance The various substances which may be used are given The following example is given Dehydrated sodium perborate 30 silver salt of *p* hydroxybenzoic acid 1.6 and tartaric acid 11.25 Gm.—*DEUTSCHE GOLD UND SILBER SCHEIDENSTALT VORM ROESSLER* Brit Pat, 421 692 (Dec 28, 1934) (S W G)

Sage Oil in Perfumery and Cosmetics Properties and uses are discussed Because of its disinfecting power the oil may be used in the following types of toilet vinegars (1) alcohol (90%) 1000 parts, glacial acetic acid 100, acetic ether 20, water 300, lavender oil (terpeneless) 15 bergamot oil (terpeneless) 5, sage oil 3, (2) water 7000 parts, alcohol 3500 bergamot oil 30 citronella oil (terpeneless) 3, oil of orange 10, sage oil 25, lavender oil 5, oil of neroli 5 50% sage infusion 500 Allow to stand for 24 hours add tincture of benzoin 60, and tincture of tolu 60 Shake and add wine vinegar 2000 parts After 24 hours filter and add 90 parts of glacial acetic acid Finely powdered dried leaves of sage are of advantage in tooth powders and pastes, the drug as well as the oil is valuable as a deodorant in baths and in the form of a wine or tea is of value in healing abscesses and internally to counteract fevers and grippe—*A M BURGER Riechstoff-Ind*, 10 (1935) 61-63 (H M B)

Solar Shields—Comments on A discussion on the formation of sunburns and tans It appears that sunburn preventives should absorb strongly between 2950-3150 Å units to be the most effective The writer feels that when the label of a good sunburn preventive claims to promote tan it is not misbranding for by preventing burning and dermal injury, pigmentation is acquired faster and is deeper than in skins which have been burned—*L STAMBOVSKY Drug and Cosmetic Ind* 36 (1935), 551-552, 554 (H M B)

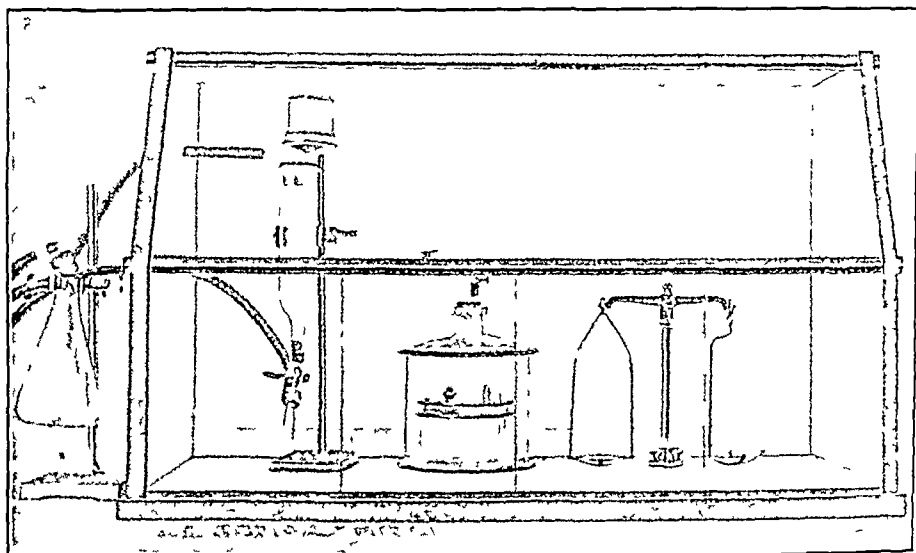
Tooth Preparations—Soaps and Soap Substitutes in The use of soaps is discussed The disinfecting power of soaps might be increased by the addition of Nipasol or Nipabenzyl Saponin from quillaja may be added in small amounts as well as Turkey Red oil and fatty alcohols—*J AUGUSTIN Riechstoff-Ind*, 10 (1935), 59-60 (H M B)

DISPENSING

Acriflavine Emulsion—Simple Formula for The emulsion may be prepared by dissolving acriflavine in equal parts of lime water and arachis or olive oil The formula is acriflavine B P 1 Gm, lime water B P 500 cc arachis (or olive) oil, B P 500 cc Dissolve the acriflavine in the lime water add the oil and shake thoroughly The preparation is highly antiseptic and is particularly useful in the treatment of wounds abrasions burns of lesser degree and scalds and in severe burns after preliminary treatment with tannic acid—*J WALKER TOMB Prescriber*, 29 (1935), 207 (S W G)

Dispensing Cabinet—Aseptic The dispensing cabinet described has the following advantages It may be swabbed with an antiseptic solution as it is made chiefly of glass, it may be completely closed when not in use, with a little practice it is as easy to work with the case as on

the open bench The dimensions are Base 36 in by $19\frac{1}{4}$ in, ends 21 in high, $18\frac{1}{2}$ in wide, 11 in high at front and sloping back at 60 degrees Four glass doors, 10 in by $9\frac{1}{4}$ in in size, slide between grooves in the lower brass rod and in a grooved brass strip on the base-board The wooden interior is enameled white and the brass rods are chromium plated The illustration shows the



case assembled with balance filtration apparatus and apparatus for filling ampuls by suction The flask on the left is a water trap leading to a filter pump —C GUNN *Pharm J*, 134 (1935), 327 (W B B)

Magnesium Oxide—Incompatibility of, with Sodium Bicarbonate When the above mixture was dispensed the sediment, at first diffusible, in a few minutes was diffusible only with difficulty, and in about two hours bunches of needle like crystals were formed on the sides of the bottle No evolution of carbon dioxide took place In order to ascertain the nature of the chemical changes that occur, one mole (42 Gm) of sodium bicarbonate was dissolved in 500 cc of distilled water and one mole (20 Gm) of heavy magnesium oxide was added A crystalline deposit formed in two days Eight grams of crystals were obtained A second batch of crystals was obtained on standing The crystals were sparingly soluble in water soluble with effervescence in dilute acids and were found to consist of a hydrated carbonate of magnesium A magnesium carbonate of similar composition was obtained by using two moles (84 Gm) of sodium bicarbonate dissolved in 1100 cc of water and one mole (20 Gm) of heavy magnesium oxide It is the formation of this crystalline hydroxy carbonate of magnesium which causes the sediment in the mixture to become indiffusible —N W WEST *Australasian J Pharm* 16 (1935), 182 (T G W)

Ointment Jars—Bakelite Recently, ointment jars made of bakelite have been offered for sale The authors obtained two makes of bakelite jars and tested them with regard to 16 different ointments They found that ointments containing pharmaceuticals having phenolic hydroxyl groups as resorcinol naphthol, etc, and ointments containing mercury compounds suffer changes on contact with bakelite They also found the particular makes of jars to be technically defective —BÜCHI and SCHENKER *Schweiz Apoth-Ztg*, 73 (1935) 239 (M F W D)

Papaverine Hydrochloride—Solubility of, in Presence of Certain Salts Papaverine hydrochloride was added in different amounts to a series of solutions of sodium bromide of concentrations from 5% to 30% With 5% solution of the bromide no turbidity was produced while with higher concentrations a precipitate settled out The precipitate was found to be papaverine hydrochloride Similar results were obtained with sodium chloride, potassium bromide ammonium bromide calcium bromide and potassium nitrate Magnesium chloride had no effect on the solubility of papaverine hydrochloride in the concentrations studied —E DEFRANCE *J pharm Belg*, 17 (1935), 393 (S W G)

Solvents for Therapeutic Substances Mixtures of betaine or its homologs with amides of lower fatty acids, with or without water are useful as solvents of substances slightly soluble in water. Phenylethylbarbituric acid may be dissolved in a mixture of acetamide 65, betaine 5 and water 30% to give a solution containing 10 Gm in 100 cc of solution. Other solutions are cited. Other substances may be added to the solvent mixtures. Solutions of albuminous and fatty substances were not prepared.—EGGOCHÉMIA FABRIK CHEM UND PHARMAZEUTISCHER PRAPARATE PATZAU Austrian Pat., 140,431, Jan 25, 1935 (Cl 30f) (S W G)

Sucrose Octa-Acetate—Compulsory Use of, as Rubbing Alcohol Denaturant Regulations affecting manufacture of rubbing alcohol compounds issued by Bureau of Internal Revenue, Washington, involve the use of an entirely new denaturing material as from June 1st next, viz., sucrose octa-acetate. The formula for the new specially denatured alcohol is given. Sucrose octa-acetate is an organic acetylation product, being a white non-hygroscopic powder having an intensely bitter taste. It shall have a melting point of not less than 69.0° C and not more than 72.0° C. Other properties are also given. The formulae of rubbing alcohols are discussed.—ANON *Perf and Ess Oil Rec*, 26 (1935), 180 (A C DeD)

Tablets—Mean Deviation of Functions of Correlated Observations and of Uncorrelated Observations, as Applied to Development of formulae of correlation is set forth. It is shown how one takes account of the correlation between two variables when determining the mean deviation of a function of the two variables. A sampled group of tablets is then cited as an example as regards the relation of their weight, their content of chemicals and their percentage composition. In the case of a sampling from products made under identical conditions, it is to be expected that their weight and content of chemicals should show an absolute correlation, yet this may not be found in practice, while a correlation will be found between the weight and the percentage composition. This may be explained on the assumption that the moisture content of the tablet mass has altered by evaporation during the preparation of the tablets.—J P JACOBSEN *Dansk Tids Farm*, 9 (1935), 53 (C S L)

Zinc Oxide and Olive Oil—Mixtures of A study is reported of fifteen specimens of zinc oxide olive oil mixtures, prepared with zinc oxide of various qualities. The finer powdered the oxide used, the more solid the consistency of the olive oil mixture. Many dermatologists add lanolin to these formulas to gain such consistency.—E KARLING *Farm Revy* 34 (1935), 239 (C S L)

PHARMACEUTICAL HISTORY

Christ as an Apothecary A discussion of pictures portraying Christ as a member of this profession.—ANON *Pharm Post* 68 (1935), 165-170 (H M B)

Cosmetics—History of, in Recent Times Historical account covering the 17th and 18th centuries. Many interesting illustrations are offered.—A HAUENSTEIN *Riechstoff-Ind*, 10 (1935), 67-71 (H M B)

PHARMACEUTICAL EDUCATION

Pharmacognosy—The Teaching of Habitats in In learning habitats the average student associates the name of the drug and a geographical locality, chiefly by "brute memory." The best way to create desirable associations is to use geographical information along with discussion of the drug. This may be done by giving history, collection and commerce with topography of the region where it is found or cultivated. The Bible, the Travels of Marco Polo and other historical or travel books help to create interest. Pictures may be used or photographs, lantern slides along with commercial aspects make excellent combinations. Drug maps are very valuable helps. Maps of continents are better than world maps. The author uses them in laboratory manual the student writing drug names on his map. Knowledge of habitats is a minor part of pharmacognostical instruction but it offers a link in association between pharmacognosy and other knowledge and teachers should not overlook the value.—ELMER H WIRTH *J Am Pharm Assoc*, 24 (1935), 413 (Z M C)

Urinalysis—Teaching, to Students of Pharmacy Comments on Paper by Professor Antoine E. Greene. A pharmacist should be able to assist the medical practitioner, so study of urinalysis should be an acceptable elective and if possible a required subject. In an analysis of

urine, as much emphasis should be placed on microscopic findings as chemical, though a bacteriological examination is only necessary occasionally. A correct interpretation of chemical findings requires microscopical examination. Experience has shown it to be desirable to give chemical and microscopical instruction at the same time or during the same semester. The same instructor should teach both, but if that is not possible, the departments should cooperate. As an example of need for combined examination, presence of albumin may or may not be significant. In warm weather, samples in transit and not properly preserved often show abundant bacteria from which it is possible for sufficient albumin to be extracted to give a positive chemical test for albumin. Uric acid, triple phosphates, calcium oxalate, leucine, tyrosine and cystine are revealed microscopically by type of crystals. It is common to speak of the chemical test for blood but it is a test for hemoglobin and does not reveal whether there is a hemoglobinuria or a hematuria. Hematuria indicates a pathological condition of the genitourinary tract, hemoglobinuria is usually the result of abnormalities outside the genitourinary tract. Hematuria, in addition to giving positive chemical test, will be indicated by finding unruptured red corpuscles, microscopically. Pus cells, casts and mucus will be found by microscopical examination when chemical tests are negative. It is difficult to get all important data into one course. A number of notations were added to those in the course outlined by Professor Greene.—LOUIS GERSHENFELD *J Am Pharm Assoc*, 24 (1935), 417 (Z M C)

Urinalysis—Teaching, to Students of Pharmacy The author believes that urinalysis should be retained in the curriculum of pharmacy, at least as an elective, equivalent in hours and credit to the biochemistry outlined in the Syllabus. The course should teach the technique of routine examination of normal and pathological urines. Time is insufficient for microscopic or bacteriological analysis. The paper continues with some details of how the course is given at Howard University, some special means of creating interest on the part of the students and concludes with an outline of the course.—ANTOINE E GREENE *J Am Pharm Assoc*, 24 (1935), 166 (Z M C)

MISCELLANEOUS

Dentists and Pharmacists—Professional Relations between Suggestions for the improvement of. Though dentistry has been practiced for centuries, dentistry as a distinct profession dates from 1839 when the Baltimore College of Dentistry, the first dental school in the world was established. As the profession has advanced, it has been increasingly exploited by manufacturers. Use of preparations about which they know little is unconsciously encouraged by dentists because much prescribing is done by word of mouth. They are inadequately trained in prescribing and there is constant pressure by detail men. The American Dental Association is aware of this condition and has established a Council on Dental Therapeutics. The purpose of the Council is to acquaint the profession with useful drugs and their preparation and to expose useless or unacceptable things. These findings are reported each month in the *Journal of the American Dental Association* and they will be compiled in a book similar to the New and Non Official Remedies of the American Medical Association. Personal contact of individuals of both professions offer many opportunities for suggestions for prescriptions to take the place of proprietary articles. In most dental schools, students have little opportunity to prepare or combine drugs and dentists lack confidence in writing prescriptions. Since dentistry is becoming more of a preventive science and the need for laboratory tests will become greater as time goes on, this is in no way an encroachment on the practice of medicine. Pyorrhea is a case in point. A dentist should have a knowledge of the blood sugar before undertaking treatment. By having a white count and a granulocyte count it would be a simple matter to differentiate between Vincent's infection and granulocytosis. Postgraduate courses should be sponsored by pharmacy and dental schools. The men in pharmacy should be available to dental societies and other groups who need information about more efficient drugs.—C L WHITMAN *J Am Pharm Assoc*, 24 (1935), 392 (Z M C)

U S P and N F Publicity in a Retail Pharmacy—The Successful Application of The author explains some of the means of publicity adopted.—LAWRENCE S WILLIAMS *J Am Pharm Assoc*, 24 (1935), 395 (Z M C)

PHARMACOLOGY, TOXICOLOGY AND THERAPEUTICS

PHARMACOLOGY

Acetyl Beta Methylcholine—Action of, on Ventricular Rhythms Induced by Adrenaline Acetyl beta methylcholine in man tends to counteract the effect of adrenaline on the rhythmic property of the ventricles —M H NATHANSON *Proc Soc Exptl Biol Med*, 32 (1935), 1297 (A E M)

Adonidin—Minimum Emetic Dose with The Magnus Hatcher method of biological determination by the cat can be used to determine *Adonins I* with the same security as with digitals The lethal dose for the cat is 0.476 mg /Kg It has a diuretic action —M F PASTOR, E E IMAZ and C GRIOT *Rev asoc med Argentina*, 46 (1932), 1515, *Anales asoc quim Argen tina*, 22, 219B, through *Chem Abstracts*, 29 (1935), 3466

Alcohol—Extent of Absorption of, at Various Intervals after Oral Administration The percentage of absorption is, after 1/4 hour 57.7%, after one hour 88.5%, after one and 1/2 hours 93.4% and practically complete after 2 hours —R N HARGER and H R HULPIEU *Proc Soc Exptl Biol Med*, 32 (1935), 1247 (A E M)

Amidopyrine—Effect of, on Leucocyte Count Rabbits, infected with the respiratory disease, snuffles, or with an acute intestinal disease characterized by diarrhea, loss in weight and death, developed a pronounced leucocytosis Large daily doses of a preparation containing amidopyrine and 5,5 diallylbarbituric acid (cibalgine) (I), 1–4 tablets, were given to rabbits of the following groups normal rabbits, infected rabbits and thyroidectomized infected animals Leucocyte counts were made on corresponding animals not receiving I The authors conclude that I does not diminish the number of leucocytes in the circulating blood of normal rabbits when given in large doses for 17 consecutive days The pronounced leucocytosis which occurs in rabbits with snuffles or gastrointestinal infection is not depressed by I, administered over 17–30 days Rabbits thyroidectomized 6 weeks previously and receiving I develop a leucocytosis in response to the infections comparable to that which develops in rabbits with thyroids intact Many differential counts were made from time to time of animals to which the drug was administered The percentage of granulocytes of the total leucocyte count was at all times within the range of normal variations Table —M M KUNDE, R P HERWICK A LEARNER and M STERNBACK *Proc Soc Exptl Biol Med* 32 (1935), 1121, through *Squibb Abstr Bull*, 8 (1935) A-725

Amytal—Effect of, upon Pilocarpine-Induced Submaxillary and Gastric Secretion Amytal causes a delayed shortening of the pilocarpine induced secretion The effect appears on the second day or later —MARY F MONTGOMERY *Proc Soc Exptl Biol Med*, 32 (1935), 1287 (A E M)

Bichromate—Skin Sensitivity to A case showing a high degree of specific sensitization of chromates is reported A definite skin reaction was obtained with 0.000,0033 Gm of potassium bichromate applied externally and with 0.000 000,0033 Gm on intradermal inoculation Attempts at passive transfer yielded negative results —C E HERCUS *Lancet*, 228 (1935) 985 (W H H)

Caffeine, Coffee and Decaffeinated Coffee—Effect of, upon Blood Pressure, Pulse Rate and Simple Reaction Time of Men of Various Ages These studies were made upon sixteen men who received coffee or caffeine plus decaffeinated coffee Decaffeinated coffee did not affect the reaction time Two mg of caffeine or the equivalent of coffee per Kg shortened the reaction time as compared with decaffeinated coffee in some individuals and lengthened it in others With doses of 3–4 mg of caffeine per Kg the initial reaction time was shortened as compared with the caffeine less coffee, but on the following day the reaction was frequently longer One to two hours after coffee (equivalent to 3, 4 and 5.5 mg of caffeine per Kg) the blood pressure was higher (5–10 mm Hg) and the pulse rate slower in some individuals, and faster in others, than the blood pressure and pulse rate after the decaffeinated coffee The changes in blood pressure and pulse rate elicited by coffee were more pronounced in the older men than in some of the younger ones —KATHRYN HORST and WILLIAM L JENKINS *J Pharmacol*, 53 (1935), 385 (H B H)

Colchicine—New Physiological Property of Intravenous injection of 0.05 mg epinephrine (adrenaline) (I) in a 16.5 Kg dog chloralosed, bivagotomized at the neck and subjected to artificial respiration, increased the carotid pressure 114 mg mercury and totally inhibited peristalsis for 87 seconds After the intravenous injection of 2.75 mg colchicine (II) per Kg in 4 successive doses,

the above dosage of I raised the carotid pressure 172 mm mercury and stopped peristalsis for 108 seconds. Experiments with another dog using larger doses of II up to 15.5 mg per Kg gave similar results. Thus II, like cocaine and several related substances, increased the motor and inhibitor effects of I on the whole animal.—R. HAMET *Compt rend soc biol*, 118 (1935), 1292, through *Squibb Abstr Bull*, 8 (1935), A-731.

Corynanthine—Antagonism of, to Epinephrine Tested on the rabbit's cornea, cocaine has one-half and corynanthine one eighth the anesthetic activity of yohimbine. In chloralosed 10-11 Kg dogs intravenously injected with 35-60.5 mg of corynanthine hydrochloride, the intravenous injection of epinephrine provoked slight polypnea instead of apnea. In one case although the epinephrine was rendered slightly hypotensive by corynanthine it produced a transient cessation of respiration before slight polypnea, indicating that the respiratory effects are not exclusively dependent on the modifications of the blood pressure.—R. HAMET *Compt rend soc biol*, 118 (1935), 774, through *Squibb Abstr Bull*, 8 (1935), A-651.

Croton Oil—Action of Substances Isolated from The strongest active substance isolated from croton oil is croton resin. But since it is normally not present in croton oil it must be considered as an artificial product. The non-toxic basal substance is phorbol $C_{20}H_{30}O_6$. Acetyl phorbol, $C_{22}H_{32}O_{10}$ is a crystalline substance the activity and toxicity of which are very similar to that of the amorphous croton poisons. It stimulates the central nervous system has a pressor effect on the blood pressure and stimulates the vagus of warm blooded animals. In large doses it has a paralyzing action (narcosis of cold-blooded animals). In low concentrations it causes contraction of smooth muscles (vasoconstriction and peristalsis). The automatic centers of the frog's heart are paralyzed at an early stage.—R. BOHM, B. FLASCHENTRAGER and L. LENDLE *Arch expil Path Pharmacol*, 177 (1935), 212, through *Quart J Pharm Pharmacol*, 8 (1935), 152.

Digitalis—Assay of Preparations of, in Man Digitalis assay in frogs and cats is not absolutely accurate. The activity of digitalis preparations should be tested separately in each patient affected with heart disease by comparing the dose with that of *k* strophanthin found adequate in maintaining the proper heart conduction. The ratio thus obtained gives an accurate measure of digitalis potency and may be compared with values similarly determined in other cardiac cases. The digitalis preparation must be administered for a considerable length of time. The heart is found to undergo changes in response when its weakness has been improved by administration of digitalis. Disturbances in heart beat such as bigeminy and decrease in conduction are not signs of digitalis hyperdosage as previously supposed. They are not to be considered accurate measures of the intensity of digitalis action. The circulatory action of digitalis compounds is determined by the condition of the circulation. Once it has changed the status of the circulation digitalis subsequently reacts differently. Strophanthin is not useful as a basis of comparison with digitalis preparations in the non-congestive type of heart disease. Here, various preparations should be compared directly with each other, by the intravenous route. The activity of various digitalis preparations as assayed in 25 individuals is as follows: 0.3 mg *k* strophanthin intravenously is greater than 0.75 mg digilamid orally, 1.5 mg digilamid rectally equal to 0.8 mg digilamid intravenously, greater than 0.3 mg helleborein intravenously, 0.6 Gm digipurat orally, 3600 frog units convallaria orally less than 1 cc digalen intravenously, 0.3 Gm digitalis orally is greater than 6000 frog units convallaria orally and rectally greater than 3000 frog units orally. 0.8 mg Verodigen orally is greater than 3000 frog units convallaria orally, 0.8 mg digilamid intravenously is equal to 0.3 mg strophanthin intravenously, 0.7 mg digilamid intravenously corresponds to 0.25 mg strophanthin intravenously.—E. EDENS *Klin Wochschr*, 14 (1935), 414 through *Squibb Abstr Bull*, 8 (1935), A-577.

Digitalis—Potency of Oregon Conflicting evidence regarding physiological activity of digitalis is found by examination of the literature. It grows wild on the Pacific slope from Vancouver to California and report is made of a seasonal study of it in Oregon. Monthly collections of both first-year and second-year leaves during the spring and summer of 1932-1933. Tinctures were prepared according to U. S. P. directions and the tinctures were stored in a cool place. They were assayed by the official "one hour" frog method using frogs of the species *Rana pipiens*. An attempt was made to correlate physiological activity with seasonable glucosidal content by the proposed colorimetric method of Knudsen and Dresbach but there was difficulty because it seemed impossible to compare tinctures which were greenish with the standard ouabain solution which was dark yellowish. The following conclusions were reached: "the physiological activity of first

year leaves compared favorably with the second-year leaves, the activity of native digitalis plants under favorable climatic conditions would probably be above U S P standard, the one hour frog method is unsatisfactory chiefly because of the time element which has a tendency toward erratic results, observed only a slight difference in the susceptibility of frogs to cardiac stimulants through various seasons"—DONALD KUO CHIH LEE and ERNST T STUHR *J Am Pharm Assoc*, 24 (1935), 367 (Z M C)

Digitalis—Rectal Absorption of, in Cats Since digitalis frequently causes nausea and vomiting, when administered by mouth, administration by rectum has been suggested and preparations for use that way have been offered to the medical profession. A study was undertaken to determine what preparation is best suited to rectal use. In a preliminary experiment a dealcoholized fluidextract was administered to two cats by rectum. There was difficulty in keeping the digitalis solution in the rectum because of the severe irritation but enough was retained to cause death in from 3 to 3½ hours. Five series ranging from 5 to 15 each were carried out to determine rate of absorption of different preparations. Results of each series are tabulated so that comparisons are readily made. Suppositories with powdered digitalis and with extract of digitalis in cacao butter base, suppositories with glycerinated gelatin alone and lastly a dealcoholized tincture were used. The cats were kept under light anesthesia throughout. After 5 hours after administration of the rectal preparation standardized digitalis solution sufficient to cause death was introduced intravenously. Clinical reports highly recommend rectal digitalis therapy but findings in this investigation do not confirm those reports. Absorption was slow and small in amount, irregular and erratic. The most rapid absorption was observed when dealcoholized tincture was used. Nausea and emesis occurred in the interval elapsing between the rectal administration and the intravenous administration in about half of the experiments but may have been due to the anesthetic. Autopsies disclosed considerable irritation and inflammation. The actual significance of these results will not be evident until the absorption rate following oral administration has been determined in the same manner. The rectal method should have more investigation before it is accepted as conventional.—W ARTHUR PURDUM *J Am Pharm Assoc*, 25 (1935), 374 (Z M C)

Digitalis—Studies on the Bioassay of III A New Diuretic Cat Method In toxic amounts digitalis has a peripheral constrictor effect on the blood vessels of the kidney in animals, which, taken with the weakening effect on the circulation, decreases output of urine (oliguria). Since digitalis has a cumulative action, oliguria should follow repeated administration of small doses and effect may be measured by measuring urine output at short intervals. Increase in toxic activity as shown by decreasing output of urine should serve as guide to rate and amount of administration in intravenous methods of assay and by indicating approach of death make possible a more accurate determination of minimum lethal dose than the continuous intravenous injection. The following experimental procedure was tried on the cat. Three tinctures were tested. The change from diuresis to oliguria was studied. Minimum lethal doses were determined and compared with those by other methods. Experimental procedure is given in considerable detail and a typical protocol of procedure and results is reported. Comparison of minimum lethal doses of the three tinctures are shown by table as well as the comparison of this method with four other methods. The assays corroborate observations made in the literature that cats vary in susceptibility to digitalis. Assays of one tincture were very uniform but the others showed large positive and negative variations. Variations in frogs and guinea pigs are not so important because large numbers can be used. In the new method the drug is not injected continuously and this should be an advantage because digitalis acts slowly making an accurate determination difficult if a rapid, continuous injection method is used. The constantly decreasing output of urine is more easily discernible than the heart changes ordinarily observed by auscultation in the usual cat method. Best results were obtained with cats weighing from 2 to 3 Kg, those above or below these weights showing wider variation in susceptibility. The wide individual variation in susceptibility to digitalis makes their value questionable since in practice only a few animals can be used. Results of dog and guinea pig assays agreed more closely with each other than with those of the cat method.—JAMES H DEFANDORF *J Am Pharm Assoc*, 24 (1935), 369 (Z M C)

Dinitrophenol—Effect of, on Heart The amplitude of contraction of the Straub frog heart and rhythmic frog heart muscle strips was irreversibly decreased by 1,000,000 2,4 dinitrophenol (I) or 4.6 dinitro-*o*-cresol (II). II was more toxic than I, its effect being apparent in concentra-

tions of 1 5,000,000 I in concentrations of 1 150,000 decreased the minute volume in the Starling heart lung preparation of a cat from 94.5 to 42 cc within 9 minutes. Again, II was more toxic, producing an immediate decrease in the minimum volume and in arterial pressure. Concentrations of 1 30,000 of II rapidly arrested the heart. With the average dose of 3-5 mg/Kg of I and 0.5-1 mg/Kg of II, the concentration of the drugs in the human body fluids is 1 220,000-1 115,000 and 1 320,000-1 660,000, respectively, concentrations definitely toxic to the heart preparations.—H STAUB and K MEZEY *Arch exp'l Path Pharmacol*, 178 (1935), 52, through *Squibb Abstr Bull*, 8 (1935), A-710

Drugs—Absorption of, through the Oral Mucosa Humans and dogs served as the experimental subjects in these tests. As compared with the effectiveness of subcutaneous administration, the ratios for a number of drugs were found to be as follows upon sublingual applications: sodium pentobarbital, 1, apomorphine, 2, strychnine, 4, atropine, 8, morphine, 10, dilaudid, 15, codeine, greater than 15. Adrenaline and insulin produced no distinct effects when administered sublingually even in large doses. There was close agreement between the results obtained in human subjects and dogs in the case of sodium pentobarbital, apomorphine, atropine, morphine, dilaudid and adrenaline.—ROBERT P WALTON and C FRANK LACEY *J Pharmacol*, 54 (1935) 61 (H B H)

Drugs—Effect of Altitude on the Action of I Strychnine Report is made of an investigation whose purpose was to make quantitative studies of the variation in lethal doses and the speed of action, all variables except altitude being kept constant. Strychnine sulphate was used. In one series of experiments, one hundred tame rats were used, in the other, Columbian ground squirrels. The rats were purchased in Denver, and half of them sent to Hillsboro, Oregon. Feed was purchased in Denver and divided. Animals were held for three months to insure acclimatization. The poison solution was prepared in Denver and divided. The same technique of administration was employed. Room temperature, barometric pressure, relative humidity and character of weather were recorded. Conditions checked well, so barometric pressure was chief variation. Climatological comparisons are given in one table. Other tabulations showing detailed experimental results, correlations on the basis of probable errors of the averages, averages with survival evaluations included, significance of correlations and experimental results for Columbian ground squirrels—oral administration. The lethal dose for 100% of the rats tested was 12.50 mg/Kg at Hillsboro and 10.00 mg/Kg at Denver. Also 10/10 animals at Hillsboro died in 25 minutes after 4.1 minutes of the intermittent tetany while at Denver the figures were 15.0 and 4.0 minutes, respectively. The following conclusions were drawn: "1. A change in elevation of 5000 feet caused a 20% reduction in LD_{100%} and a 40% decrease in the T/D (time to death), following oral administration of strychnine as the sulphate to tame rats. 2. Statistical analysis shows the effects observed are not highly significant, ranging from 1-20 to 1-5000. 3. Inclusion of survivals by a percentage system of evaluation, causes the curves to approach the ideal. 4. Successive increase of elevation of 1000 feet produced a definite and fairly constant reduction in LD_{100%} of strychnine administered orally to Columbian ground squirrels. 5. Ground squirrels appeared to be more susceptible than rats to changes in elevation."—A W MOORE and JUSTUS C WARD *J Am Pharm Assoc* 24 (1935) 460 (Z M C)

Ergot—Biological Determination of Alkaloids of Ergot alkaloids can be readily determined on the basis of their antagonistic action to adrenaline. The rhythmic oscillations of surviving rabbit intestines are decreased by adrenaline and this effect of adrenaline is prevented by the alkaloids of ergot. As the reaction is reversible the same portion of intestine can be used two or three times. The effect of 2γ adrenaline was decreased 27.5% by 3γ ergotamine, 54.3% by 4.5γ, 57.4% by 5γ, and 71.5% by 7.5γ ergotamine. Sensibamine separated from Hungarian ergot is as strong as ergotamine.—B ISSEKUTZ and M LEINZINGER *Magyar Gyógyszereszlud Társaság Értesítője*, 11 (1935), 171, through *Chem Abstr* 29 (1935), 3775

Evipal—Hypnosis, Anesthesia and Toxicity These studies were made upon rabbits and rats to which the drug was given, with but one exception intraperitoneally. The optimal hypnotic dose was found to be 50 mg per Kg for rats. The optimal anesthetic dose is 100 mg per Kg for the rat and 70 mg per Kg for the rabbit. The response of both of the species of animals to Evipal intoxication is described. The M L D for the rat is 280 mg per Kg, the toxic anesthetic hypnotic ratios in the rat being 100.36.18. The authors conclude that this compound has a high coefficient of effectiveness.—A H MALONEY and R HERTZ *J Pharmacol*, 54 (1935) 77 (H B H)

Follicular Hormone—Assay of, in Commercial Preparations The assay method employed for a large series of commercial preparations was the following Of a group of 9 castrated mice, 3 were given an amount corresponding to the claimed unit, 3 an amount 20% lower and 3 an amount 20% higher A positive reaction was determined as usual by the vaginal streak The smallest amount giving a positive reaction was then injected into 20 mice, while 20 further mice were given a unit of the standard preparation under the same conditions In the majority of instances, 20 additional mice received either a 20% higher or 20% lower dose subcutaneously in order to substantiate the results An ovarian preparation made from crystalline follicular hormone and containing 10 mouse units per cc and giving a positive reaction in 90% of animals, was used as a standard for the water soluble preparations, and one containing 500 mouse units per cc and giving 95% positive reactions was used for comparison with the oil soluble hormone preparations The results were as follows for number mouse units per cc as claimed and as found and for percentage positive reacting mice, respectively (I) Water soluble preparations Fontanon 100, 100, 78, Hovigal 100, 100 83, Hormofollin 100, 200, 80, Menformon 100, 133, 85, Oestrarin 100, 100, 75, Ovodis Extract 100 100, 73, Ovoglandol 50, 50, 92 5, Ovolut 50, 50, 70, Panhormon 50, 40, 70, Progynon 20, 20, 98, Uden 10, 10 73, Agomensin —, 10, 85, Ovaralopton —, 0, —, Ovarium-Extract —, 0, —, Rejuven —, 0, —, (II) Oil soluble preparations Perlatan 1000, 1000, 87, Sistomensin —, 1, 70, (III) Solid preparations (tablets, etc.), where unit is per tablet or dragee Novarial 150, 150, 70, Oestrarin 100, 100, 80, Oophorn 50, 50, 92 5, Ovanorm 20, 20, 92 5, Ovoglandol 20, 20, 95, Ovosedicyl 10, 10, 80, Ovotransannon 10, 10, 95, Panhormon 10, 7-8 75, Biovar —, —, Novopak —, —, Ovaraden —, —, Ovaria sicc (Grubler) —, —, —, Ovaria sicc (Merck) —, 3, —, Ovarial tablets —, 16-20, —, Ovarial powder —, 4, —, Ovarigen —, 2, —, Ovarium tablets —, 2, —, Ovarochrom —, 2 —, Ovoglandosan —, 1 5, —, Ovohorma —, 1, —, Vitrisol m Ovaria —, traces, —, Zettolax —, traces, — In the case of the latter preparations the unit value based on 100 Gm dry substance was calculated to be Biovar 4000, Novopak 1500, Ovaraden 800-900, Ovaria sicc (Grubler) 2000, Ovaria sicc (Merck) 4300, Ovarial powder 4000, Ovarigen 2000, Ovarium tablets 4000, Ovoglandosan 1250 —M KOCHMANN *Arch Exptl Path Pharmacol* 177 (1935), 526, through *Squibb Abstr Bull*, 8 (1935), A-591

Gonadotropic Hormone—An Improved Method for Determination of the A method of extraction of 40 cc of blood by acid alcohol method is described The material is tested on an immature female rat —U J SALMON and ROBERT T FRANK *Proc Soc Exptl Biol Med*, 32 (1935) 1236 (A E M)

Liver Preparations—Use of Pigeons in the Assay of The results of previous workers are summarized The following method for staining pigeon reticulocytes is recommended A drop of blood is taken up in a graduated micro pipette and blown on to a waxed slide Exactly twice the volume of stain (aqueous solution containing 0.3% brilliant cresyl blue and 1% sodium citrate) is added and mixed with the blood Incubate for 15 minutes at 35° C, then immediately make thin smears on a clean glass slide, spreading with the edge of another slide and dry in the air Allow to stand for 1 hour before counterstaining for 3 minutes with undiluted Jenner's stain The staining solution should be fresh Only "densely reticulated" cells (cells showing a complete or almost complete ring of reticulum around the nucleus) should be counted No correlation could be found between the reticulocyte count and administration of liver extract to pigeons that had been fed on a grain diet The author suggests the use of a mammalian test-animal for reticulocyte tests, because the reticulocyte percentage of the blood of mammals is a definite figure and is easily obtained —M R GURD *Quart J Pharm Pharmacol*, 8 (1935), 39-53 (S W G)

Magnesium Salts—Comparative Studies on the Utilization of Different Little information is available concerning relative utilization of magnesium compounds occurring naturally in food-stuffs as compared with the lactate and citrate and inorganic magnesium compounds The present study was undertaken for the purpose of finding out if there were differences Young white rats were used as experimental animals Calcium and phosphorus balances were carried at the same time Calcium phosphorus and magnesium concentrations were kept fairly constant Formulas for diet are given and all details are reported The different compounds used do not differ materially in absorption or utilization The greatest and the least retentions were obtained with the same magnesium salt Magnesium absorption measured by the sum of the urinary and retained magnesium averaged 32.5% of the intake varying between 29 and 41% "Carswell and Winter have shown that after oral administration of magnesium lactate one may obtain either high

calcium and low magnesium or low calcium and high magnesium retentions " Probably magnesium compounds in linseed meal and alfalfa producing low calcium and high magnesium retention is not due to any difference in behavior Addition of sodium carbonate up to 2% of the diet had no unfavorable effect on utilization of calcium, phosphorus or magnesium —J C FORBES and F P PITTS *J Am Pharm Assoc*, 24 (1935), 450 (Z M C)

Male Fern—Rhizome and Extract of After reviewing the methods of bioassay of male fern, the author describes a method studied at Lund in 1933 The organism used is the tench fish (*Tinca*) of 5-10 cm length A weighed quantity of the drug extract (1 to 20 cg) is triturated with 0.5 Gm sugar and then shaken with a liter of water, saturated with magnesium hydroxide Ten fish are put in each flask with a liter of fluid Concentrations ranging between 0.025-0.001% are used The number of fish killed in 4 to 6 hours is recorded The biological test shows the chemical assay for filicin (as given in the Swedish and the new Danish Pharmacopœias) to be valid —T AHLM *Farm Revy*, 34 (1935), 309 (C S L)

Mercurial Antiseptics—Action of, on Muscle Oxydase The inhibitory or depressant effect of various mercurials for the muscle enzymes does not run parallel to their antiseptic activity but is rather an index of their toxicity Mercurochrome 1:250 to 1:100, while quite efficient to destroy bacteria, did not inhibit the action of muscle oxydase to any great extent, while solutions of mercuric bichloride (1:10,000 to 1:5,000) were markedly depressant for the enzymes —DAVID I MACHT and HILAH F BRYAN *Proc Soc Exptl Biol Med* 32 (1935), 1244 (A E M)

Morphine, Codeine and Dilaudid—Comparison of Motor Effects of, on Thierry Fistulæ These studies were made upon dogs in which intestinal motivity was determined by the use of balloons inserted into Thierry preparation The authors conclude that morphine, codeine and dilaudid cause prompt spastic effects which are quite similar The minimal dosages in terms of mg per Kg producing a twenty-minute spastic period are dilaudid 0.01, morphine, 0.30, codeine 3.0 Dilaudid was found not to produce the prolonged periods of spasticity characterizing the action of morphine and codeine —ROBERT P WALTON and C FRANK LACEY *J Pharmacol* 54 (1935), 53 (H B H)

Morphine—Effect of, on Human Ureter The effect of morphine on the intact human ureter was studied in 24 patients with presumably normal kidneys, by means of hydrophotographic tracings by Trattner's method Some patients were subjected to radioscopy Subcutaneous doses of 1-1.2 gr caused markedly increased tone and larger amplitude of contraction waves in from 2-5 minutes following injection of the drug When increasing doses were given at 1/2 hour intervals, the larger clinical dose of 1/2 gr gave a greater effect than the smaller doses of 1/4 to 1/8 gr The effect lasted at least three hours Doses of 0.01 gr atropine eliminated the contractions of the morphine stimulated ureter with consequent loss of tone Atropine did not act strikingly or consistently when given alone The authors consider that the common idea that morphine quiets the ureter is incorrect Their findings confirm experimental data The literature is reviewed —N F OCKERBLAD, H E CARLSON and J F SIMON *J Urology* 33 (1935), 356, through *Squibb Abstr Bull* 8 (1935), A 661

Nembutal—Effect of, upon Serum Cholesterol of Dogs Nembutal sufficient to produce deep and prolonged narcosis has no influence on the serum cholesterol —E H B. DWELL, F H SHILLITO and K B TURNER *Proc Soc Exptl Biol Med* 32 (1935) 1235 (A E M)

Pharmacological and Toxicological Viewpoints in Cosmetology The action of the following are discussed water, metallic salts, sulphur, iodine, acids and alkalis, hydrogen peroxide, formaldehyde, tannin, glycerin, alcohol, volatile oils and soaps An extended bibliography is offered —H TRUTWIN *Riechstoff Ind Kosmetik* 10 (1935), 101-103 (H M B)

Pumpkin Seeds—Anthelmintic Action of The seeds of *Cucurbita pepo* were examined chemically and biologically The test animals were earthworms The fatty oil was extracted in a Soxhlet percolator with petroleum ether A 45% yield of a reddish oil was obtained For the biological test a 5% emulsion of the oil in water and a 10% trituration of the fresh peeled seeds in water were used About 150 cc of each preparation was placed in a beaker and three worms were dropped into each solution The trituration showed anthelmintic action but the emulsion did not The resin extracted from the oil by alcohol was tested as above with negative results Ten per cent aqueous hydroalcoholic and alcoholic extracts were likewise inactive Tests for glycosides, alkaloids and resin were negative The negative results obtained and the prohibition of the use of hot water in making a paste of the seeds suggested the presence of a volatile constituent

ent Fifty grams of the crushed, peeled seeds were steam distilled until 100 cc of distillate were collected This distillate killed worms within 15 minutes The carrier of the anthelmintic action of pumpkin seeds is therefor a volatile substance The experiment was repeated several times with seeds from various sources with similar results except that the activity of the various distillates varied greatly No reason could be assigned for this The following tests applied to the distillate were all negative ferric chloride, Schiff, Millon, Legal, Fehling, Nessler and Deniges reagents, lead acetate and silver nitrate Diazotization and addition of phenol produced no perceptible color The distillate after oxidation with incandescant strips of copper gave a red color with Schiff's reagent Methyl and ethyl alcohol were not present —A PRISTER *Pharm Ztg* 80 (1935), 394 (G E C)

Pyrethrin I and Pyrethrin II—Relative Toxicity of Pyrethrin I and II were prepared by extraction with kerosene and the mixture purified by dissolving in pentane, extracting with hot methyl alcohol, the alcohol mixed with water and the pyrethrins again extracted with pentane After drying, the solution was cooled to -50° and pyrethrin II precipitated pyrethrin I remained in solution Injected into frogs, (II) produced death in doses of 75 mg per Kg of body weight, (I) in doses of 80 mg per Kg while a mixture of equal parts of (I) and (II) only required a dose of 66 mg per Kg —JEAN RIPERT and OLIVIER GAUDIN *Compt rend*, 200 (1935) 2219 (G W H)

Salyrgan—Intraleural Injection Intraleural injections of Salyrgan produce a greater and more lasting diuretic effect than do the intravenous injections —S HORWITZ *Deut Med Wochschr*, 61 (1935), 305 (H R)

Splenic Capsule—Effect of Drugs on the Isolated, of Man and Other Animals The following summary is given 1 A survey was made of the action of various drugs on isolated strips of the capsule of human spleens and the splenic capsules of dogs rabbits, cats rats, guinea pigs and buffaloes 2 Contraction of the splenic capsule was produced by adrenaline, pilocarpine, arecoline or histamine and under certain conditions also by acetylcholine 3 If the tone of the splenic capsule had first been increased by adrenaline, it was inhibited by the addition of atropine pituitary (posterior lobe) extract, sodium nitrite or ergotamine and under certain conditions also by acetylcholine and adenosine 4 The contractor action of acetylcholine was increased by eserine 5 The contractor actions of acetylcholine, arecoline and pilocarpine were abolished by atropine 6 The action of adrenaline was abolished by ergotamine and diminished by cocaine Tracings showing the results obtained are given for each series of actions —K SAAD *Quart J Pharm Pharmacol*, 8 (1935), 31-38 (S W G)

Strychnine and Barbiturates—Elimination of Regardless of the amounts of strychnine administered, the quantities recovered in the urine are small elimination by the kidney being very slow The amounts of strychnine in the organs are also very small The elimination of Gardenal in the urine is also slow, the amounts rejected by the kidney being of some importance —E KERGOUD *Bull soc pharm Bordeaux*, 73 (1935), 53-61 (S W G)

Thymus Extracts—Biological Effects of The outstanding physiological feature of the thymus gland is its growth during youth and involution at puberty A group of American workers (L G Rowntree, J W Clark and A M Hanson) who worked with an extract of calves' thymus found that in rats which were the offspring of thymus treated rats (themselves also treated) until the fifth generation, the appearance of important physiological events such as opening of ears, eruption of teeth, appearance of hair, descent of testes and opening of the vagina, were greatly diminished as compared to the control litters —ANON *Brit Med J*, 1 (1935) 983 (W H H)

Thyroid—Acetonitrile Test for The acetonitrile test for thyroid using mice of both sexes was carried out varying the conditions of observation The susceptibility of mice to acetonitrile poisoning, and the degree of protection afforded by thyroid, are both affected by the temperature at which the mice are kept At 38° C the average lethal dose is about a fifth of that at room temperature, and practically no protection is afforded by thyroid At lower temperatures a protective action can be detected, but the dose/mortality curve for acetonitrile becomes very much flattened, making it difficult to apply the acetonitrile test to a quantitative method of assay —F WOKES *Quart J Pharm Pharmacol* 8 (1935), 54-60 (S W G)

Thyroid—Assay of Various Preparations of Feeding of equal amounts of thyroxin in the form of various thyroid preparations, e g, whole thyroid, iodothyroglobulin, fractionated iodo-

thyreoglobulin, iodothyronin and thyroxin, produced increasing illness in rats. Some of the substances gave a more pronounced calorogenic effect while in the case of the rest, the other general thyroid actions were predominant. This difference appeared to be dependent upon the nature and amount of iodine free and iodine containing substances accompanying the thyroxin. The latter, while inactive or of slight activity in themselves, were capable of influencing the action of thyroxin considerably, e g, duodotyrosine had a marked antagonistic effect on thyroid hormone. The thyroxin content of the various preparations examined was determined by splitting the thyroxin component from the accompanying substances by means of alkaline hydrolysis and then determining the amount of thyroxin present either by adjusting the alkaline hydrolysate to pH 5 or extracting it with butyl alcohol and proceeding in a manner previously described.—I ABELIN *Arch expil Path Pharmacol*, 177 (1935), 359, through *Squibb Abstr Bull* 8 (1935), A 630

Thyroxin—Point of Action of Experiments in anesthetized cats (urethane or 5 ethyl 5 phenyl-barbituric acid) before and after decapitation or section of the spinal cord in the cervical or dorsal region indicate that the main point where the action of thyroxin occurs is the midbrain. Increase in metabolism takes place because of irritation of this center.—B V ISSEKUTZ and B V ISSEKUTZ JR *Arch expil Path Pharmacol*, 177 (1935) 442, through *Squibb Abstr Bull* 8 (1935), A-630

Vegetable Extracts and Blood-Sugar Attention is directed to products from vegetable and animal sources, brought out since the discovery of insulin and like it capable of producing hypoglycemia. It was observed, too, that the serum or defibrinated blood of an animal made hypoglycemic by insulin, by the plant extracts, by chemicals, by starvation or by pancreatectomy would lower the sugar in another animal and could even cause death. Apparently there was no limit in the possibility of transmission of decrease in sugar and toxicity from one individual to another. Myrtomel (earlier called myrtillin) had rather marked claims made for it but clinical experience was not encouraging. The present investigation was undertaken to determine the nature of the substance responsible for the power to reduce the amount of sugar in the blood. Experimental work is reported in detail. Rabbits were the test animals. Normal amount of sugar was determined. Determination was also made of the percentage of sugar produced in stated periods of time by specific doses of epinephrine. An extract from the leaves of salal fed to rabbits and subcutaneous injections were without effect. Results with *Vaccinium ovatum* were negative. So some of the work on myrtomel was repeated but results were negative. Then the earlier work of Collip was repeated, using an extract from green onion tops, from lettuce leaves and from cabbage, all with negative results. Attempts to verify Collip's observation that hypoglycemia can be transmitted from one animal to another resulted in failure. The authors conclude that "reputed therapeutic value of plant extracts in the control of blood sugar is erroneous." Collip's work might indicate that the large quantity of liquid injected and the period of starvation could derange metabolism. Other works apparently drew conclusions from too few experiments. The authors believe it entirely reasonable to question the existence of evidence that plants contain a substance which will alter amounts of sugar in the blood"—PAUL S JORGENSEN and E V LYNN *J Am Pharm Assoc*, 24 (1935), 389 (Z M C)

Vitamin A—Various Methods for Determination of A brief review of physical and biological methods (especially the U S P Interim Revision method) for the determination of vitamin A with bibliography.—B RÖNNARK *Farm Revy* 34 (1935), 369 (C S L)

Vitamin D—Content of, in Salve Bases Containing Cholesterol I Absorption through the Intestinal Mucosa Anhydrous lanolin contains the provitamin, which on proper irradiation is transformed into vitamin D and then possesses antirachitic properties, yet lacks toxic action, e g, does not produce calcium deposits. II Absorption through the Skin The vitamin D produced in these salves by proper radiation is absorbed through the skin and then exerts its antirachitic action without toxic action. Under comparable conditions essentially more vitamin D is absorbed through the intestinal mucosa than through the skin. Either ordinary or irradiated ergosterol apparently causes a thickening of the elastic coat in the rabbit aorta, cholesterol does not exert this action. Irradiated ergosterol is absorbed through the skin.—A ST VON MALLINCKRODT-HAUPT *Z Vitaminforsch* 4 (1935), 1, 16, through *Chem Abstracts* 29 (1935) 3463

Vitamin D—Determination of A review and discussion of the U S P Interim Revision (1934) method for the determination of vitamin D.—B RÖNNARK *Farm Revy* 34 (1935) 233 (C S L)

Vitamin Standards—International International standards for vitamins A, B₁, C and D are now available for issue to laboratories, institutions and research workers in Great Britain and Northern Ireland. The National Institute for Medical Research, London, will continue to supply these standards. The standards for the vitamin B₁ and D remain unchanged and their supply at regular half yearly intervals will be continued as before. The standard for vitamin A has been changed, a pure specimen of β carotene having been adopted in place of the impure preparation hitherto employed. The unit of vitamin A remains unchanged, though it is now defined as the vitamin A activity contained in 0.6 microgram of pure β carotene.—*Pharm J*, 134 (1935), 353

(W B B)

TOXICOLOGY

Acetanilide Poisoning Clinical and Experimental Study The author reviews the outstanding signs and symptoms as taken from the records of several patients poisoned by proprietary preparations containing acetanilide. Two dogs were given acetanilide in their diet, in varying amounts. It was found that these animals developed some tolerance to the drug. The red cell count tended to be diminished initially but as the intoxication progressed the rate of formation of the red cells became greater than the rate of destruction. The animals showed marked fluctuation in their methemoglobin response, the greatest concentration occurred six to eight hours after the drug had been ingested. There was a complete reversion of the methemoglobin to hemoglobin within forty-eight hours. During the methemoglobinemia the oxygen capacity falls and symptoms of anoxemia may result. Electrocardiographic studies revealed no changes of significance.—*SHELDON PAYNE J Pharmacol*, 53 (1935), 401

(H B H)

Atophan Poisoning A description of a case of fatal liver damage after several weeks' use of Atophan is given. Overdosage and continuous use without intervals were avoided, thus stressing the danger of this drug.—*HUBERT HABES Deut Med Wochschr*, 61 (1935), 173-174

(H R)

Boric Acid Preparations—Toxicity of Skin Disturbances through the Use of Defatting Agents Containing Boric Acid Four cases of skin diseases were observed which were directly attributable to the use of defatting agents containing boric acid. The symptoms were an itchy redness of the chin, neck, head and trunk, thickening of the skin which was covered with very fine scales and vesicles, appearance of the trunk and extremities resembling that in pityriasis rosea, or an erythematous, scaly and very itchy exanthema of the trunk, neck and flexor sides of the extremities. The symptoms disappeared with discontinuation of the use of the preparations.—*ALOIS M MEMMESHEIMER Deut Med Wochschr* 61 (1935), 418

(H R)

Caffeine and Theobromine—Effect of, upon Digitalis Toxicity Employing the cat method of Hatcher and Brody the authors assayed ouabain, strophanthin, digitoxin and three tinctures of digitalis and compared the values so obtained with those upon cats receiving varying amounts of caffeine or theobromine subcutaneously or intravenously. Small doses of caffeine or theobromine did not seem to influence the toxicity of any of these digitaloids. Large doses of caffeine and theobromine (30-50 mg \times Kg body weight) seemed to slightly increase the toxicity of all the preparations studied. The results indicate that in amounts ordinarily employed clinically caffeine and theobromine probably do not influence the toxicity of ouabain, strophanthin or digitalis preparations to any appreciable extent.—*H B HAAG and J D WOODLEY J Pharmacol*, 53 (1935), 465

(H B H)

Castor Beans—Toxicity of A fatality following the eating of 15-20 castor beans is reported. The toxic substance ricin was responsible. This causes necrosis in the blood vessels tissues and cells through agglutination coagulation and precipitation.—*ABDULKADIR-LUFTI Deut Med Wochschr*, 61 (1935), 416

(H R)

Fluorine Toxicosis Apples sprayed with barium silicofluoride showed an average fluorine content of 5.6 p p m before washing. It was impossible satisfactorily to clean fruit originally carrying 0.1 gr or more of fluorine per lb. The human tolerance level for fluorine is so low that it seems a dangerous practice to use the compounds of fluorine for spraying purposes. The ugliness of mottled teeth alone causes untold misery to the afflicted persons.—*M C SMITH Am J Pub Health*, 25 (1935), 701

(A H B)

Skin Poisons—A Chapter on Mexican The following plant products produce skin reactions of various types (1) *Comocledia engleriana* causing abscesses on mucous membranes of the mouth which are difficult to heal and may be introduced in tobacco (2) the magic remedy of

Dr Villegas, Marañon (*Makagoninusz*, *Anacardium occidentale*) containing cardol, the irritating principle, (3) *netles* and similar products such as Junco or Flor de Latigo (whipping flowers) which is the flowers of *Aporocactus flagelliformis* Lem, (4) Maguey manso (*Agave salmeana* Otto), (5) Barbas de chivo or Chihillo de Cerro (*Clematis dioica* L.) which contains an alkaloid, clematine, which, however, is not a skin poison, (6) introduced from Europe is Rabano rusticano (*Armoracia rusticana* Gaertn.), (7) Herba del Coyote (*Polanisia usne glandulosa* Cappariid.), (8) Pica-Pica del Peru (from Peru) is in the Mexican market as "Ojo de venado" or "Ojo de borrico." Some of these poisons act only on the mucous membranes leaving the epidermis unaffected as (9) Pinoncillo or Aveno purgante, the seeds of *Jatropha curcas* L. var. *mexicana* (10) the Euphorbiaceae Yepau huil (*Croton dioicus* Cav.) or Hierba de Zorillo in a short time covers the mucous membranes of the anus with small red spots and inflamed pustules. Others produce inflamed areas under the skin. (11) the sap of Habilla de San Ignacio or Quauhtlatlatzin (from *Hura crepitans* L.), (12) *Hippomane manizella* L. or Mazanillo, (13) Chupire (Chuprene, Tencuate) an unusually irritating poison from the unripe seeds and secretion of *Euphorbia calyculata* H. B. K., (14) the leaves of Cola de pescado, Cola de iguana or Hierba de alacan (*Plumbago pulchella* Boiss.) called by the Aztecs Tlachichinolli whose irritating sap is used to day for the treatment of wounds caused by poisonous insects, flies, scorpions, etc. (15) the most common of all is the poison sumach Cuau or Mala mujer (*Rhus radicans* L.). An extract of Yobe (*Grindelia hirsutella*, spec. *Californiana*) is of help in counteracting these poisons if applied immediately.—V. A. REKO *Pharm Post*, 68 (1935) 173-177 (H. M. B.)

Sodium Amytal—Detoxification of Amidopyrine by The toxicity of amidopyrine by production of convulsions can be reduced to $\frac{2}{3}$ when optimal doses of sodium amytal are given.—CHARLES L. ROSE *Proc Soc Exptl Biol Med*, 32 (1935), 1242 (A. E. M.)

Sodium Formaldehyde Sulphoxylate—Use of, in Acute Mercury Poisoning The author demonstrates the protective effect of formaldehyde sulphoxylate against mercury poisoning in rabbits, verifying the results that he had previously obtained upon dogs. The substance has been utilized clinically and found to be of distinct value in mercury poisoning. The author suggests the following procedure in its use in the treatment of clinical bichloride poisoning: 1. Gastric lavage with a 5% solution of sulphoxylate, about 200 cc being left in the stomach. 2. Immediately following this, 10 Gm. of the drug dissolved in 100 to 200 cc. of distilled water to be slowly injected intravenously, from twenty to thirty minutes being permitted for the injection. 3. In severe cases a repetition of the intravenous injection from four to six hours following the completion of the first injection, from 5 to 10 Gm. being injected. 4. If colitis develops later high colonic irrigations with a 1:1000 solution of sulphoxylate.—SANFORD M. ROSENTHAL *J Pharm Macol*, 54 (1935), 34 (H. B. H.)

THERAPEUTICS

Calcibronat—Clinical Experience with *Calcibronat*, $(C_{12}H_{21}O_{12})_2 Ca CaBr$, is used in the treatment of nervous exhaustion, hypererethism, hyperthyroidism and epilepsy. Due to the synergism existing between the calcium and bromine it can be given in small doses which are effective, over a long period of time without causing bromism or bromide acne.—K. KEUS *Dent Med Wochschr*, 61 (1935), 799-801 (H. R.)

Carcinoma as an Electrical Phenomenon of Protein Substances The theories of protein formation and their chemistry and those devoted to their connection with tumor and carcinoma formation are fully discussed. It is concluded that a possible remedy against this malady must be capable of regulating the "redox"-potential of glutathione or its heavy metal complex. Such a buffer must be a disulphide as well as an albumin. These regulators have been made by the worker and tried upon certain cases with good results.—O. HUPPER *Pharm Monatsh*, 16 (1935) 92-96 (H. M. B.)

Chloral—Use of, in Infant Therapy Chloral is generally employed in the treatment of convulsions in infants. The modes of administration are reviewed by G. Schreiber (*Bull Medic* (Feb. 10, 1934), through *J Praticiens* (May 10, 1934)). The dose is generally 10 to 20 cg. per year of age. For convulsions the remedy is prescribed separately or together with potassium bromide as follows: Chloral hydrate 0.3 Gm., syrup of orange flowers 30 Gm., distilled water enough to make 100 Gm. Take 1 teaspoonful every half hour (for an infant of 3 years) until sedation. Chloral hydrate 1 Gm., potassium bromide 2 Gm., syrup of codeine 10 Gm., syrup of

orange flowers 10 Gm, distilled water enough to make 100 Gm Six teaspoonfuls every 24 hours Chloral hydrate 0.1 Gm, potassium bromide 0.25 Gm, boiled water 40 Gm For 1 enema At the same time give a water diet and every 3 hours a warm bath (38°) lasting for 6 minutes This is continued until a sound slumber is produced Chloral hydrate 0.2 Gm, cacao butter 2 Gm For 1 suppository Introduce 1 or 2 every 24 hours In the case of tetanus contractions, chloral will give results when most of the common sedatives are without effect —*L'Un Pharm* (Mar 1935), 68, through *J pharm Belg*, 17 (1935), 429 (S W G)

Cod Liver Oil Ointment "Unguentolan"—Investigation with Cod Liver Oil Ointment "Unguentolan" is of therapeutic value in treatment of severe burns, *Ulcus cruris*, decubital tumors, fistulas, deep wounds, etc The action of vitamins A and D seems to cause a marked regeneration of tissue with excellent cicatrization Parenteral use of vitamins A and D is superior to the oral in the treatment of wounds and burns The remaining constituents of cod liver oil seem to enhance the action of the vitamins The ointment is convenient for clinical use and alleviates pain to a great degree —KURT STRAUSS *Deut Med Wochschr*, 61 (1935), 50-52 (H R)

Digilamid—Clinical Studies with Intestinal and Parenteral Administration of Clinical experiments for the last year and a half involving some 100 cardiac patients substantiate the findings of many other investigators regarding the good tolerance, rapid diuretic effect and excellent administration of Digilamid When using the enteral form of administration, it was found that 15 drops of Digilamid 3 times a day *per os* correspond to 3 doses of 0.1 Gm standard digitalis leaves There were some isolated failures due to individual hypersensitivity and idiosyncrasy In the latter case, Digilamid was often given successfully in the form of an enema, the best formula even in severe cases of decompensation, being 25-30 drops twice daily mixed with 3-5 cc of 10% glucose solution and 3-5 drops opium tincture Further potentiation of diuretic action was realized by the addition of 0.3 Gm Theocin The intravenous route which is also very effective, is limited to those cases which cannot tolerate the drug perorally and there is urgent need for rapid absorption of the greatest possible amount of Digilamid Here it is advisable to dilute the Digilamid with 10 cc calcium gluconate or 10-15 cc 10-20% glucose Considerable shortening of the treatment can be affected by combining with diuretics such as Salyrgan, which appear to be more active following the administration of Digilamid Digilamid does not seem to have the cumulative property to as great a degree as the other digitalis preparations Clinical blood pressure and water balance are claimed to be more accurate criteria for ascertaining when Digilamid treatment should be stopped than the appearance of bradycardia and electrocardiographic changes The latter may be independent of Digilamid dosage —E-E BAUKE *Deut Med Wochschr*, 61 (1935), 371-375 (H R)

Digitalis—Effect of, on Pneumonia A study of 1456 cases of lobar pneumonia indicated that digitalis had no apparent effect on the course of the disease, but seemed beneficial in its influence on auricular fibrillation and flutter in favorable cases 34 references —A E COHN and W H LEWIS *Am J Med Sci*, 189 (1935), 457, through *Squibb Abstr Bull*, 8 (1935), A 615

Dye Solutions—Therapeutic Stable solutions suitable for use by injection in combating infectious diseases contain a 3,6 diaminoacridine compound such as 3,6 diamino 10 methylacridinium chloride and an excess of a sulphonated dye such as trypan-blue, trypan red or acid fuchsin —LOUIS BENDA (to Winthrop Chemical Co) U S Pat, 1,999,750 (April 30 1935)

(T G W)

Folnerner In cases of cardiac insufficiency with and without disturbances in rhythm and wherein digitalis treatment was indicated, the new glucoside folnerner from *Folia Neri Oleandri*, produced a complete effect on pulse, diuresis, body weight and congestive symptoms, the diuretic action was especially marked The dosage was 15 drops of the solution (= 0.2 mg folnerner = 240 frog doses) three times daily in moderate and severe cases After 8-10 days, further dosage was unnecessary or could be reduced Rectal administration of suppositories containing 0.2 mg of the glucoside were as effective, about 20 were given in the course of 8-14 days The rapidity of the action (in 7 cases within 24-36 hours usually 5-6 days) and the effectiveness of the oral or rectal routes make intravenous injection unnecessary Folnerner exhibited the complete effect of digitalis in its action on disturbances in the production and conduction of cardiac activity No unpleasant side reactions or cumulation symptoms were observed after the usual 8-20 days or chronic treatment The action was not only complete, but prolonged Folnerner is important as a cardiac remedy because it is a chemically uniform pure glucoside independent

of any standardization methods and shows constant activity. It is highly recommended for general practice. The present study involved 80 cases of which only five proved refractory.—R SCHWAB *Klin Wochschr*, 14 (1935), 564, through *Squibb Abstr Bull*, 8 (1935), A 704

Gastro-Sil—Use of, in Nervous Hyperacidity A neutral insoluble calcium silicate, administered in doses of one teaspoonful three times a day in warm water at meal time for the treatment of nervous hyperacidity.—FELIX OEFELIN *Deut Med Wochschr*, 61 (1935), 597-598 (H R)

Heart Lesions—Therapeutics of Non-Decompensated The fact that digitalis is not specific for all heart lesions is stressed. Citations of the literature and the author's own opinions concerning indications and contra-indications of digitalis in various cardiac diseases are presented. Quinine and quinidine are reviewed as to their value in heart therapy. The efficacy of a circulation hormone sugar therapy with admixture of cardiac glucosides and calcium in cardiac lesions is discussed. Treatment of syphilitic heart lesions and affections of blood vessels are also discussed.—P MORAWITZ *Deut Med Wochschr*, 61 (1935), 1-4, 45-48 (H R)

Hypotensive Hormone Cause of Protein Shock The hormone, lymphoganglin isolated from the lymph glands induces all the actions of protein shock. Due to this fact it is thought to be the etiological factor in this condition. Where protein therapy is unsuccessful due to an impaired lymphatic system, it is advised that this hormone be used.—G DE NITTO *Deut Med Wochschr*, 61 (1935), 339-341 (H R)

Liver Extracts—Characteristics and Therapeutic Use of, Treatment of Anemias of Bacillary Origin A review abstracted from the literature.—LUCAS F DEFELICE *Semana med (Buenos Aires)*, 42 (1935), 1086 (A E M)

Lubrokal—Clinical Investigations of Very effective in treatment of nervous headaches, general nervousness, chorea minor, psychic depressive states, insomnia, nervous types of heart and respiratory disturbances etc. Obtained in tablet form containing 0.6 Gm bromine as ionized potassium bromide and 0.04 Gm sodium ethylphenylbarbituric acid in each tablet.—ANTON SCHUMACHER *Deut Med Wochschr*, 61 (1935), 378-379 (H R)

Lymphatic Leukaemia—Treatment of The effect of Lugol's iodine solution in chronic lymphatic leukaemia has been investigated. A definite reduction in the white cell count was seen in two out of five cases. The administration of iodine produced no noticeable symptomatic relief. Even in favorable cases the effect of iodine is small compared with that of X ray therapy, the latter remains the best treatment at present available for chronic lymphatic leukaemia. The nature of the effects of iodine seems to suggest that it acts on the leucocytes themselves rather than on the leukaemic process. The bearing of these results and those of previous writers on the aetiology of leukaemia, especially its relation to hyperthyroidism, is discussed.—M C G ISRAELS *Brit Med J*, 1 (1935), 1021 (W H H)

Mandelic Acid—Value of, in Urinary Infections An attempt to discover a therapeutic agent that might replace the ketogenic diet in the treatment of urinary infections has led to the clinical trial of mandelic acid. Mandelic acid appears to be effective in cases of urinary infection unassociated with urinary obstruction and it is hoped that a more wide-spread trial of the acid may confirm the work previously given.—M L ROSENHEIM *Lancet*, 228 (1935), 1032 (W H H)

Methylene Blue—Treatment of Wound Diphtheria by E Melchoir (*Zentralbl f Chir* (March 2, 1935), 481) states that diphtheria, as a secondary and non-malignant complication of surgical wounds, became comparatively frequent in certain parts of Germany from 1919 to 1925. It then seemed to disappear, but Melchoir of late has seen it somewhat more often. An indolent wound results either with a characteristically 'greasy' appearance or with recurrent formation of membrane. Intact granulation tissue forms an impassable barrier against diphtheritic as also against tetanus and typhoid toxins and treatment by parenteral antitoxin injections in these non-toxic cases is usually fruitless. The inefficiency of local antiseptic treatment in wound diphtheria has been widely recognized. Melchoir publishes a further recommendation of the treatment which he has found more effective—namely, application of powdered methylene blue. This quickly penetrates granulation tissue and leads within twenty-four hours to blue coloration of the urine, it has been found to be followed within seven to fourteen days by the disappearance of diphtheria bacilla. The application should be pursued for one or two weeks. Melchoir has also found it successful in nasal diphtheria and cutaneous diphtheria.—*Brit Med J* 1 (1935) 1204A (W H H)

Novophyllin—Clinical Experience with Novophyllin (theophyllin phenyl ethyl barbituric acid ethylene diamine) is a cardiac tonic and diuretic. It is not limited to oral use but can be used rectally, intravenously and intramuscularly.—W SOMMER *Deut Med Wochschr*, 61 (1935), 633-635 (H R)

Orthosichol Clinical Investigations of a New Preparation from Koemis Koetjung, the Indian Kidney Tea Orthosichol, a preparation from the Indian drug Koemis Koetjung, and also found in *Orthosiphon stamineus* Benth, has been proved an effective agent in the treatment of diseases of the biliary apparatus. Besides promoting diuresis, it markedly increases the secretion and expulsion of bile. At the same time, it enhances the secretion and glycogen storage in the hepatic biliary region. An analgesic and anti-inflammatory action is displayed in infectious biliary tract diseases. The average dose of orthosichol is 25 drops 3 times a day *per os*, severe cases require 2-3 cc intravenously each day.—HELLMUT RUTENBECK *Deut Med Wochschr*, 61 (1935), 377-378 (H R)

Pernicious Anemia—Liver and Drug Therapy in Until recently, arsenic has been the chief element used to combat the disease. Many forms of arsenic have been used. It is now generally conceded that if arsenic did produce an improvement it was due to its destructive action on the liver, with the liberation of the specific antianemic principle. The idea of diet as a curative agent is not a new one, but usually the diet prescribed was non nitrogenous and chosen rather for the dyspepsia and for the atrophic condition of the stomach than for any specific effect on the blood. The following conclusions were drawn: (1) There is a definite and stable antianemic principle ready formed and stored in liver. (2) There is, in normal gastric secretion, an intrinsic factor, capable of producing this antianemic principle by interaction with beef and other muscular tissues. (3) This intrinsic factor is not hydrochloric acid or pepsin. (4) There is in beef and other muscular tissues which are not themselves antianemic, an extrinsic factor, capable of reaction with the intrinsic factor of stomach to produce the antianemic principle. (5) The activity of hog stomach is due to the interaction between the mucosal intrinsic factor and the extrinsic factor found in the muscle coat. (6) The antianemic principle is readily synthesized within the body from ordinary foods in normal gastric conditions, but the absence of the intrinsic factor in the gastric mucosa determines the onset of pernicious anemia.—B L STANTON *Australasian J Pharm*, 16 (1935), 165 (T G W)

Pernocton—Value of, in Basal Narcosis Basal narcosis has been produced in 230 cases with Pernocton (5- β bromallyl-5 sec butyl barbituric acid) with and without the addition of ether. Advantages and disadvantages have been noted.—HELMUTH GREGER *Deut Med Wochschr*, 61 (1935), 170-173 (H R)

Potassium Bismuth Tartrate—Oral Administration of, in Syphilis J A Kolmer (*Arch Derm Syph* (Jan 1935), 9) draws attention to the value of administering bismuth by mouth in syphilis. It is not suggested that this should replace the more effective intramuscular bismuth medication, but that it is of use in the following instances: (1) as a follow up in between the courses of injections of N A B or bismuth, or when the patient is unavoidably prevented from taking injections for a short period, (2) as a method of starting treatment in chronic syphilis particularly cardiovascular syphilis, and (3) for occasional use by patients who are traveling or who cannot tolerate injections. The preparation recommended is water soluble potassium bismuth tartrate which is of high spirocheticidal value and low toxicity. The dose for adults is 2 to 3 grains in a capsule three times a day.—ANON *Brit Med J*, 1 (1935), 73 (W H H)

Prominalettes—Use of, as Sedative Tablets containing 0.03 Gm Prominal (5 ethyl-1-methyl 5 phenyl barbituric acid) have been successfully used as a sedative in 60 cases including *Enuresis nocturna*, nervous insomnia, climacteric disturbances, nervousness, hyperthyroidism, etc.—PAUL PLAUT *Deut Med Wochschr*, 61 (1935), 175 (H R)

Prontosil—Use of, in Puerperal Fever It is recommended that every type of puerperal fever be treated with intravenous injections (20 cc 1-2 times daily) of 0.25% solution of the hydrochloride of 4-(2',4'-diaminophenylazo)-benzenesulfonamide (Prontosil), supplemented by oral treatment with 0.3 Gm tablets. The red crystalline powder which dissolved to an orange-red liquid can also be administered subcutaneously. It was successfully used in 2 cases of streptococcal 2 staphylococcal, several of streptococcal staphylococcal and 13 undiagnosed puerperal fevers.—EUGEN ANSELM *Deut Med Wochschr*, 61 (1935) 264-265 (H R)

Prontosil—Use of, in Streptococcal Infections Prontosil, 4-(2',4'-diaminophenylazo)-

benzenesulfonamide-HCl, is recommended in 1-2 daily intravenous injections of 10-20 cc of a 0.25% solution or 3 doses of 0.3-0.6 Gm perorally in all severe forms of streptococcal angina and its complications, erysipelas the initial stages of Sepsis lenta, in progressive and severe endocarditis lenta where *Streptococcus viridans* has been identified and in certain forms of infectious polyarthritis. The dye is claimed to be non-toxic and well tolerated. Only rarely were gastric pains and vomiting observed after oral doses. Intravenously there were no unpleasant symptoms. Circulation, respiration, blood pressure, pulse frequency, intestine and urine remained unaffected.—PH KLEE and H RÖMER *Deut Med Wochschr*, 61 (1935), 253-255 (H R)

Pyramidon Therapy—Side Reactions of Explanations and problems of Pyramidon therapy and toxic reactions are presented.—LORZE *Med Klin* (1934), through *Deut Med Wochschr*, 61 (1935), 319 (H R)

Quinidine and Strychnine—Use of, in Treatment of Premature Contractions A case history is given in which, of the various treatments used, quinidine sulphate (gr. in) and strychnine (gr. 1/60) thrice daily gave the greatest freedom from extrasystoles and from the accompanying symptoms and improved the compensation. Sixteen of 20 other patients with mild cardiac decompensation due to extrasystoles showed a similar favorable response with a combination of quinidine and strychnine. Possibly the chief factor in preventing the more wide spread use of quinidine is the number of warnings, considerably overemphasized, of its dangers.—J BAILEY CARTER and EUGENE F TRAUT *Am J Med Sci*, 189 (1935), 206, through *Squibb Abstract Bull* 8 (1935), A 551

Quinine—Therapy of Respiratory Diseases by Quinine in the form of Solvochin (25% aqueous quinine solution in slightly alkaline medium) and Transpulmin (camphor oil solution of quinine) is very effective when injected intragluteally in chronic diseases of the respiratory organ.—B THOMS *Munch med Wochschr*, 82 (1935), 420, through *Squibb Abstr Bull*, 8 (1935), A-597

"Sea Sickness Remedy Bayer" A discussion of its use in sea sickness.—CARL LUDWIG to SCHMIDT *Deut Med Wochschr*, 61 (1935), 798-799 (H R)

Silver Manganite Preparations—Use of, in Dermatology Silver manganite in admixture with an ointment base made from vaseline and ground nut oil and buffered to pH 5.4, has been found to have a healing effect on leg ulcers, wounds of all types, dyshidrotic eczema and impetigo contagiosa. A preparation containing silver manganite, benzoin tincture and ether gave a good bactericidal effect in cases of impetigo contagiosa, folliculitides, moist and impetiginous eczema and all forms of intertriginous eczema and produced rapid drying of the affected parts so that growth of bacteria and fungi was stopped.—A PILLOKAT *Munch med Wochschr* 82 (1935) 540, through *Squibb Abstract Bull*, 8 (1935), A-554

Specialties and Products of Research in 1934 A review of the progress in hypnotics, therapy of snake bite by serums, treatment of cancer, hormones, vitamins, enzymes, new specialties, oligodynamics of silver, discovery of new elements, and heavy water, new apparatus and experimental methods.—K SCHULZE *Apoth Ztg* 50 (1935) 207-211, 227-231 (H M B)

Strophanthin—Treatment of Angina Pectoris by Strophanthin was used with good results in 66 cases of angina pectoris in doses of 0.2-0.4 mg given daily for three days followed by one day's interval. Several cases required larger doses.—H ZIMMERMAN *Munch med Wochschr*, 82 (1935), 286, through *Squibb Abstract Bull* 8 (1935), A-599

Sulfarsenol in Erysipelas P. Barre (These de Paris, 1935, No 57) reports thirty-four cases in patients aged from 18 months to 78 years, fifteen of which were mild, twelve severe and seven very severe. Arsenical treatment may be administered by subcutaneous, intramuscular or intravenous routes. The dosage depends on the age of the patient, the state of his liver, kidneys and heart, and the severity of the attack. Usually the dose for adults is 12 cg, which may be increased by 6 cg daily, while that for the child is 0.5 cg per kilo of body weight. The average number of injections required is about two. As a rule they should be given every two days except in severe cases where more energetic treatment is necessary.—*Brit Med J*, 1 (1935) 1060B (W H H)

Syphilis and Malaria—Investigations in Combating A review.—B HEINZ *Pharm Monatsh*, 16 (1935), 41-45 (H M B)

Urea—Value of, as a Diuretic "Ituran" (effervescent urea tablets) intravenous injections of a 40% aqueous urea solution and intravenous intraperitoneal or intrapleural injections of

Salyrgan with urea have a very good diuretic action in heart muscle diseases and are without secondary manifestations—K WERSE M m W, Nr 48, through *Deut Med Wochschr*, 61 (1935), 35 (H R)

Vitamin D—Absorption of, through the Skin The author has shown that rickets may be cured in rats after 8 days by rubbing irradiated ergosterol into the skin A solution of the vitamin was made in olive oil A dose of 5 $\frac{1}{2}$ international vitamin D units was not satisfactory however a dose of 10 units gave results The result was determined by the "line test"—M E FODOR *Zeitschr f Vitaminforschung* (1934), 241, through *Pharm Weekblad*, 72 (1935), 697 (E H W)

NEW REMEDIES

SPECIALTIES

Abúsan Capsules (Busano Laboratories), an analgesic in the treatment of migraine and rheumatism, contains the diethylbarbiturate of dimethylaminophenyldimethylpyrazolon with caffeine citrate in equimolecular amounts besides saponin—*Pharm Monatsh*, 16 (1935), 50 (H M B)

Aderol (Kynazon-Werk, Frankfurt) is an external alcoholic preparation containing *d*-bornyl acetate (1%), an isothiocyanic ester (0.5%), camphor (5%) and ethereal oil (17%) used in the treatment of whooping cough, bronchitis and pneumonias of infants and older children—*Drug and Cosmetic Ind*, 36 (1935), 775 (H M B)

Alloton (Riedel-de Haen, Berlin) is a chemical combination of garlic oil (12%) and dioxycholic acid Each coated pill contains the active constituent of 1 Gm fresh garlic It is used in digestive disorders, worms, climacteric changes and arteriosclerosis—*Drug and Cosmetic Ind*, 36 (1935), 775 (H M B)

Anox (Schering-Kahlbaum A G) is a grain weevil preparation which is used as a spray (1:10) to purify and disinfect granaries—*Pharm Monatsh*, 16 (1935), 97 (H M B)

Antighda (Breit and Co, Hamburg), a liniment for rheumatism, is a yellow solution of hexamethylenetetramine and salicylic acid perfumed with oil of mirbane yielding a residue upon evaporation of about 20%—*Apoth Ztg*, 50 (1935), 253 (H M B)

Apicosan N (Dr A Wolf, Bielefeld) is a special form of the bee poison preparation Apicosan and is used to combat neuritis, etc—*Pharm Monatsh*, 16 (1935), 8 (H M B)

Arojocol (Schwanen-Apotheke, Mainz) is a constructive tonic for children and adults containing cod liver oil, chalk, sodium ammonium phosphate with the addition of Recresal—*Pharm Monatsh*, 16 (1935), 8 (H M B)

Askaridol Dragees (Bayer) consists of the active constituents of oil of chenopodium (50%) in 4-beta diethyl amino ethoxyolyl anilid benzoate in packages of 20 dragees equivalent to 0.015 Gm ascaridol—*Pharm Post*, 68 (1935), 210 (H M B)

Baldronit (Otto Reichel, Fabrik pharm und biol Erzeugnisse, Berlin-Neukölln) is an alcoholic preparation of the root of *Valeriana montana* and of adonis herb to which is added ethylallyl-malonylurea amidopyrine (12.5%) It is used as a sedative and nervine for heart neuroses, epilepsy insomnia and hypertonia—*Pharm Zentralh*, 76 (1935), 291 (E V S)

Baldronit cum Nitro (Otto Reichel) contains 0.5 Gm of a 1% nitroglycerin per 100 Gm of Baldronit It is indicated for coronary sclerosis, angina pectoris and stenocardia—*Pharm Zentralh*, 76 (1935), 291 (E V S)

Bevitone (Merck and Co) is a highly concentrated preparation of Vitamin B from wheat germ and rice bran Each fluidounce represents approximately 2000 Chase-Sherman units—*Drug and Cosmetic Ind*, 36 (1935), 773 (H M B)

Bickmorin (Bickmorin, Gall Kure & Cy, Old Town, Me) for sores and injuries of all sorts of horses and cattle consists of 33% vaseline 31.5% saponifiable fats (hog fat?), 1.5% water, 17.5% sulphur, 2.5% indigo, 6% boric acid and 8% alum—*Pharm Monatsh*, 16 (1935), 97 (H M B)

Bisteril Bacilli (Fabrik Dr Wander Ges m b H, Vienna), in packages of 10, consists of Pyraligin (ortho oxyquinoline sulpho salicylate), hexamethylenetetramine hydrochloride, sodium bicarbonate—*Pharm Post*, 68 (1935), 213 (H M B)

Blumal (Lab de Pharm Med, Paris) is a solution of hexamethylenediamine iodomethylate

dimethylene diamine salicylate and papaverine hydrochloride in ampuls for rheumatic affections —*Drug and Cosmetic Ind*, 36 (1935), 775 (H M B)

Brocanal (Curta & Co., G m b H Berlin) is marketed in tablets containing 0.025 Gm phenylethylbarbituric acid, 0.4 Gm bromcalcium diethanolamine (\approx 0.15 Gm bromine and 0.037 Gm calcium) and 0.015 Gm caffeine and is indicated in epilepsies, mental disturbances depression and climacteric disorders —*Drug and Cosmetic Ind*, 36 (1935), 775 (H M B)

Calmural is an ointment containing brominated uranium oxide (9% uranium, 7% bromine) to relieve itching —*Drug and Cosmetic Ind*, 36 (1935), 775 (H M B)

Chunoform Powder (Chinosolfabrik A G, Hamburg) consists of potassium ortho oxyquinoline bisulphate (10%) with starch and talc and administered in doses of 25 and 100 Gm —*Pharm Post*, 68 (1935), 210 (H M B)

Chinoral Dragees (Chinosolfabrik A G, Hamburg) contains 0.10 Gm ortho oxyquinoline with a binding agent —*Pharm Post*, 68 (1935), 210 (H M B)

Cibalgin Tablets (Chem Industries, Basel) consists of 0.22 Gm dimethylamino phenyl dimethyl pyrazolon and 0.03 Gm diallyl-barbituric acid —*Pharm Monatsh*, 16 (1935), 52 (H M B)

Citrofinal (Chem-pharm A G Bad Homburg) is the new name for the sodium chloride free diet- and table salt **Citrovin** —*Pharm Zentralh*, 76 (1935), 292 (E V S)

Cluexin (Lowen-Apotheke, Dresden) for insect bites is a yellow salve in tubes consisting of supragenin, ethyl para amido benzoic acid, menthol and volatile oil —*Pharm Monatsh*, 16 (1935), 97 (H M B)

Collumol (Dr Blajet) is a colloidal peptic aluminum hydroxide employed in stomach affections, in hyperacidity and in abnormal fermentation —*Drug and Cosmetic Ind*, 36 (1935), 775 (H M B)

Cophenin Tablets (Pharm Laboratorium, Gleiwitz O-S) contain in each tablet caffeine (0.08 Gm), phenacetin (0.22 Gm), cinchona bark (0.05 Gm), and a series of effective homeopathic doses of antipyretics. It is used as an analgesic, antineuralgic and antipyretic —*Pharm Zentralh*, 76 (1935), 338 (E V S)

Corcumen (Temmler Works, Berlin) is distributed as capsules containing 0.1 Gm curcumin-sodium and 0.1 Gm calcium chlorate and ampuls containing 5.5 cc of a 5% solution and are employed in liver and gall bladder diseases —*Drug and Cosmetic Ind*, 36 (1935), 775 (H M B)

Cortidyn (Chemische Fabrik Promonta, Hamburg 26) is a standardized extract of the suprarenal cortex. The activity and uniformity of the preparation are controlled by biological tests on mice. It is indicated in Addison's disease, muscle dystrophy, hypogenitalism, and other disturbances of the internal secretions. It is used intramuscularly or subcutaneously in daily doses of from 0.5 to 2 cc and is marketed in packages containing 3 and 10 ampuls of 1.1 cc each —*Pharm Ztg*, 80 (1935), 431 (G E C)

Crrnol Salve (Chem Fabrik Gebeka, Dresden), a salve for burns, consists of boric and salicylic acids, of each 0.2 Gm, balsam peru 0.4 Gm, liquid petrolatum 4.2 Gm, yellow wax 5.5 Gm, Venetian turpentine 17 Gm, egg yolk 2 Gm, Xeroform 0.2 Gm and anthrasol 0.3 Gm —*Pharm Monatsh*, 16 (1935), 97 (H M B)

Danamine ("Syntetic," Grindstedvaerket, Denmark) identical to **Coramine** is 3 pyridine carbonic acid and is employed to replace by injection of the 25% solution as a cardiac tonic and in carbon monoxide poisoning —*Drug and Cosmetic Ind*, 36 (1935), 775 (H M B)

Danarsine is the calcium salt of allylarsenous acid $C_3H_5AsO_3Ca \cdot H_2O$ and has the same composition as **Arsyleen** —*Drug and Cosmetic Ind*, 36 (1935), 775 (H M B)

Dispers (Dispert, Ltd, The Hague) are preparations prepared by the dispert method of Krause whereby the liquid extract from plant parts is finely subdivided and sprayed over a surface being dried in the process. The following disperss are prepared: **Aconite-Dispert** is made up into tablets equivalent to 0.05 or 0.2 mg per tablet and is employed in neuralgia and migraine. **Aluminum Acetate-Dispert** is powdered aluminum acetate. **Belladonna-Dispert** is belladonna extract free from inert substances and containing only the active constituents of belladonna. It is sold as the powder, tablets, suppositories and solution. The powder is standardized to an atropine content of 1.5% (biologically), each tablet contains 0.25 mg atropine and each suppository 0.3 mg. **Colchicum-Dispert** is an extract from colchicum seeds standardized as to colchicine content

and is sold in capsules for rheumatism *Digitalis Dispert* is a cold water extract of digitalis leaf biologically assayed and sold as a powder, tablets, solution and suppositories *Frangula Dispert* is an extract from frangula in tablet form containing in each tablet 25 mg emodin *Pancreas Dispert* is made from pancreas and is also available as an ointment and a plaster used as an aid to digestion The tablets have a lipase value of 0.25 and the powder a value of 0.35 *Secale-Dispert* is an extract of ergot as suppositories standardized to contain in each 1 mg of alkaloids *Thyreoid-Dispert* consists of the dry powder of standardized thyroid gland *Valerian-Dispert* from the root of valerian is physiologically standardized on mice and is sold as capsules —*Drug and Cosmetic Ind*, 36 (1935), 775 (H M B)

Dolorfug-Balsam (Dr W Dernbach, Apotheker, Bad Salzschild) is a yellowish ointment containing camphor, methyl salicylate, chloroform and menthol It is used for rheumatism, ischias and lumbago —*Pharm Zentralk*, 76 (1935), 353 (E V S)

Dolorfug Capsules (Dernbach) a nerve pain, migraine and neuralgia remedy, contain dimethylaminopyrazolon, phenacetin, phenazone, magnesium oxide and caffeine —*Pharm Zentralk*, 76 (1935), 353 (E V S)

Doryl Solution (Merck) in packages of 3 and 10 ampuls contains in each ampul 0.00025 Gm doryl (addition of trimethylamine to carbaminic acid-beta chlorethyl ester) —*Pharm Post*, 68 (1935), 213 (H M B)

Dossalax (Apogepha, Fabrik chem-pharm Präparate Dr Starke & Max Biering G m b H, Dresden), a pill for chronic constipation, contains aloe, ext rhubarb comp, and *Ipomæa turpelinum* resin —*Pharm Zentralk*, 76 (1935), 338 (E V S)

Drei-Nerv-Würfel (Dr H Much A G Che Pharm Fabrik, Berlin Pankow) a biological nerve builder in tablet form (3.1 Gm) consists chiefly of lecithin, albumin, sugar grain embryo meal, organic iron and calcium salts —*Apoth Ztg*, 50 (1935), 253 (H M B)

Ergostabil (Oest Heilmittelstelle G m b H), in ampuls, contains stabilized extract of ergot and 0.5% benzoic acid —*Pharm Post*, 68 (1935), 212 (H M B)

Eunarcon (J D Riedel-E de Haen A G, Berlin) is a 10% stabilized aqueous solution of the sodium salt of isopropyl beta bromallyl N-methylmalonyl urea suitable for intravenous injection used as a narcotic in simple surgeries and in gynecology similar to ethyl chloride or as a full narcotic in short operations —*Drug and Cosmetic Ind*, 36 (1935), 775 (H M B)

Europian Tablets (F J Kwizda, Korneuburg) is marketed in packages of 10 and 20 tablets Each tablet consists of 0.26 Gm phenyl dimethyl aminopyrazolon, 0.0112 Gm diethylbarbituric acid, phenylethyl barbituric acid and magnesium peroxide —*Pharm Post*, 68 (1935), 213 (H M B)

Ezoidon Pine Needle Tablets (H Edelmann, Berlin) consists of sodium chloride colored with fluorescein and about 1% volatile oil —*Pharm Monatsh*, 16 (1935), 9 (H M B)

Ezoidon-Sulphur Bath (H Edelmann, Berlin) is used for the treatment of skin disorders, furunculosis, itches, eruptions, etc, and consists of soda 82 Gm, pine oil about 3 Gm The sulphur is in the precipitated form —*Pharm Monatsh*, 16 (1935), 9 (H M B)

Floraform (Oemata, Chem Works, Berlin) a deodorant and disinfectant, is a soap solution of formaldehyde (0.05–1%) —*Pharm Monatsh*, 16 (1935), 98 (H M B)

Floraform-Cream (Oemata Chem Works G m b H, Berlin) is a formaldehyde skin cream used to combat excessive perspiration and is a deodorant —*Pharm Monatsh*, 16 (1935), 98 (H M B)

Galicetan Dragees (S Neumeier, Frankfurt) contains 0.25 Gm dried and powdered black radish, 0.05 Gm sodium glycocholate and 0.05 Gm menthol and is used for liver and gall bladder disorders —*Pharm Monatsh*, 16 (1935), 98 (H M B)

Germucid Cachets and Tablets consist of 0.50 Gm of Germucid which is dimethylamino dimethyl oxyquinizin and 33% oxyquinoline sulphonic acid —*Pharm Post*, 68 (1935), 213 (H M B)

Glykhepar (Nordmarke Werke, Hamburg) used for primary muscle atrophy, myasthenia gravis pseudoparalytica myelosis, infantile paralysis, etc, is Hepatrat with 20% glycolol in liquid and granular form Dose Liquid—1 tablespoonful 3 times a day, granules—2 heaping teaspoonfuls three times a day —*Pharm Monatsh*, 16 (1935), 98 (H M B)

Hucomin Tablets (Hummin Chemie G m b H, Munich-Pasing) used to combat rheumatism gout, etc consist of almost crystallizable huminic acid compounds coupled with hexa-

methylenetetramine, methylamine, carbamide They are water soluble and neutral in reaction For the estimation of the pharmacodynamic effect the crystalloidal colloidal character of the humic acid compounds is important, their specific bactericidal properties as well as their reducing and amide action depends on the splitting up of the nucleic acids They are resorbable and reduce purinamidases and xanthine oxidases as well as uric acid itself with the formation of water soluble complex compounds—*Pharm Monatsh*, 16 (1935), 99 (H M B)

Humaven (Pharmazeutische Handelsgesellschaft m b H, Dusseldorf), a nerve sedative, is prepared from the raw sap of freshly germinated oats, the chlorophyll of spinach and fluid extracts of hops, valerian and Piscidia bark—*Pharm Zentralh*, 76 (1935), 105 (E V S)

Idracafin (Chem Fabrik J D Riedel A-G, Berlin) is a tablet containing 0.5 Gm of Idragin (acetylsalicylic acid Riedel) and 0.05 Gm of caffeine It is used for headache, migraine, tooth ache, rheumatism, ischias, grippe, etc—*Pharm Zentralh*, 76 (1935), 292 (E V S)

Igeneu (Chem Pharm Laboratorium Eduard Lyss, Dresden) is a solution of phenylidimethylisopyrazolon in water treated by silver catalysis with addition of desirable anesthetics It is injected under the skin for neuralgia, neuritis, etc—*Pharm Monatsh*, 16 (1935), 99 (H M B)

Inolène (Lacombe, Paris) is a coal-tar antiseptic containing essence of anise seed 2 Gm, essence of star anise 1 Gm, saccharin 0.2 Gm, tincture of quillaja impregnated with coal tar enough to make 100 Gm—*Bull Ch Synd Pharm Seine* (Feb 1935), through *J pharm Belg*, 17 (1935), 404 (S W G)

Iodéopirine (E Viel et Cie 37, Avenue de l'Opéra, Paris) is marketed in the form of tablets, each containing 0.05 Gm of acetyl-iodo salicylic acid, and as an ointment containing 1 Gm of acetyl-iodo-salicylic acid for each 24 Gm of excipient The tablets are recommended in the following doses 2 tablets 3 times a day for acute rheumatism and sciatica, 3 to 6 tablets (in 3 or 6 doses) every 24 hours for chronic rheumatism and other infections, 1 tablet with a hot drink at night for preventive treatment for grippe (S W G)

Iodopeptone CODY (Gourdal, to Brive—Corrèze) is a solution of citrated iodopeptone containing iodinated peptone (10%) 50 Gm, sodium citrate 20 Gm, distilled water enough to make 100 cc—*Bull Ch Synd Pharm Seine* (Feb 1935), through *J pharm Belg*, 17 (1935) 404 (S W G)

Katadyn-Silver (Schering-Kahlbaum A-G, Berlin) is a catalytic oligodynamic silver preparation containing 10% of silver and prepared from a 99.99% silver refined with a special surface structure from a fine capillary ceramic powder It is used locally to sterilize infections of the mucous membranes and to disinfect wounds, also by oral administration for various infectious diseases such as duodenal ulcers, dysenteries, diarrheas etc—*Pharm Zentralh*, 76 (1935), 105 (E V S)

Lygal (Dr G Henning Chem and Pharm Fabrik, Berlin-Tempelhof) is a gout remedy containing 50% calcium phenylquinoline carbonate, 29% dimethyl aminophenazon and 21% caffeine sodio salicylate It is marketed as dragees containing 0.3 Gm, as tablets of 0.75 Gm and as a 30% solution in ampuls The latter two contain the soluble sodium compound instead of the calcium salt—*Pharm Monatsh*, 16 (1935), 54 (H M B)

Métricure (Antoine, Paris) is a vaginal antiseptic containing trioxymethylene 0.1 Gm essence of lavender 0.1 Gm, essence of geranium 0.1 Gm, tannin 2 Gm, sodium tetraborate 40 Gm and sodium bicarbonate 57.7 Gm One teaspoonful should be dissolved in enough water to make 2 liters—*Bull Ch Synd Pharm Seine* (Feb 1935), through *J pharm Belg*, 17 (1935) 404 (S W G)

Mingol-Extra (H von Gimborn A-G Emmerich a Rh) a cough, croup and catarrh tablet, is prepared from oils of peppermint, anise and fennel ammonium carbonate, formaldehyde glycyrrhiza, sucrose and potato starch—*Pharm Zentralh*, 76 (1935), 338 (E V S)

Mucitekt Tablets (Nordmark-Werke G m b H, Hamburg 21) contain a mixture of mucin plant proteins and the acid binding protein constituents of blood The proteins have a high acid combining power without exciting the gastric juices The preparation has the property of coating the stomach walls to prevent the injurious actions due to food friction and gastric juices The tablets are taken for hyperacidity, ventricular and duodenal ulcers, and gastritis—*Pharm Zentralh*, 76 (1935), 338 (E V S)

Myrrhatan (Labora-Verlag Berlin), a preparation for tooth and mouth care against para

denitis, gum bleeding, etc., is prepared from tinctures of myrrh, rhatany and nutgall, oils of pepper-mint, salvia and eucalyptus and other ethereal oils of suitable flavor—*Pharm Zentralh*, 76 (1935), 338 (E V S)

Nemural (Bayer) is marketed in packages of 10 tablets each containing 0.018 Gm arecoline 4-oxo-3 acetyl amino phenylarsenate—*Pharm Post*, 68 (1935), 210 (H M B)

Neogel Acidulans (Apoth. A. Kremel, Vienna) is sold in packages of 6 small pills and consists of sulphosalicylic, acetic and lactic acids, gelatin, cocoa butter and perfume—*Pharm Post*, 68 (1935), 210 (H M B)

Neogel Antifluoric (Apoth. A. Kremel, Vienna) is marketed in packages of six pills consisting of sodium acetylarsenylate, strontium formate, sugar, dextrin, colloidal copper and Neogel pill mass—*Pharm Post*, 68 (1935), 210 (H M B)

Neogel Antigonorrhoeic (Apoth. A. Kremel, Vienna), in packages of 6 pills, contains silver proteinate, Cehasol and pill mass—*Pharm Post*, 68 (1935), 211 (H M B)

Neogel Resorbens (Apoth. A. Kremel, Vienna), in packages of 6 pills, consists of Cehasol, iodine, potassium iodide, chloral hydrate and pill mass—*Pharm Post*, 68 (1935), 211 (H M B)

Neurobrom (Bombelon-Werk, Apotheker H. Woelke, Hamburg 20) are bouillon cubes containing in each 1.1 Gm of sodium bromide, some sodium chloride, meat and plant extractives, condiments and some fat. One cube dissolved in a cup of hot water produces a suitable bouillon for epileptics, neurasthenics or neurotics—*Pharm Zentralh*, 76 (1935), 338 (E V S)

Optolax Tablets (Universitäts Apotheke E. Weber vorm Dr. Chr. Brunnengraber, Rosstock 1, Meckl.) is a cathartic used to prevent increase in weight and for gall troubles. The active ingredients are ext. aloë, ext. cascara, leptandrin and *Ipomœa turpethum* root—*Pharm Zentralh*, 76 (1935), 338 (E V S)

Pandigal is a heart remedy containing the glucoside lanadigin, (0.4 mg) as drops and tablets, ampuls and suppositories are also made containing 0.2 mg—*Pharm Post*, 16 (1935), 74 (H M B)

Penetal (Vial and Uhlmann, Frankfurt) is cyclopentenyl ethyl barbituric acid as colorless prismatic crystals, melting at 163° C., difficultly soluble in cold water while its salts are easily soluble. In doses of 0.1–0.3 Gm (1–3 tablets) it is reputed to be a hypnotic without side reactions—*Pharm Monatsh*, 16 (1935), 74 (H M B)

Poly-propeptan Dragees (Chemosan-Union, Vienna), in packages of 25, contain the peptones from apple, egg, pea, veal, potato, corn meal, milk, rice, beef, spinach, pork and wheat bran—*Pharm Post*, 68 (1935), 213 (H M B)

Postalan-Haemorrhoidal-Suppositories (Fürstl. Fürstenberg Hofapotheke R. Baur in Donaueschingen) contain ethyl *p*-aminobenzoate, resorcin, bismuth oxydodogallate, zinc oxydate, balsam of peru and cocoa butter—*Pharm Zentralh*, 76 (1935), 338 (E V S)

Pyradial Tablets (Wiedenmann, Basel) contain 0.0336 Gm diallyl-barbituric acid and 0.2129 Gm dimethyl amido antipyrine with corn-starch—*Pharm Monatsh*, 16 (1935), 75 (H M B)

Quinine Ethylphenylbarbiturate Compound (Palatin Apotheke Debreczin) is a new form of hypnotic sedative—*Pharm Monatsh*, 16 (1935), 8 (H M B)

Reichelit-Hustentee (Otto Reichel, Berlin-Neukölln) is a cough remedy containing Ledum, althaea, *Tussilago farfara*, salvia, fennel, mint, galeopsis, glycyrrhiza, pimpinella, arnica, eucalyptus, grindeia and thyme. It is used for bronchial catarrh, asthma, grippe, hoarseness and whooping cough—*Pharm Zentralh*, 76 (1935), 306 (E V S)

Reichelit-Hustentropfen (Otto Reichel) is a liquid cough drop remedy prepared from a distillate of pimpinella, anise, arnica, salvia, eucalyptus, mint and glycyrrhiza, to which is added camphor (0.1%) benzoic acid (0.4%) and ephedrine (1%)—*Pharm Zentralh*, 76 (1935), 307 (E V S)

Rheumavertan (Ernst Schumann Fabrik chem. Präparate, Berlin-Neukölln), an anti-rheumatic, is a solution of a salicylic acid ester, a small percentage of ammonium phenylquinoline carbonate, camphor, menthol and an ethereal distillate of the pinene and terpene series in sulphurated oleic acid esters of plant oils—*Pharm Zentralh*, 76 (1935), 227 (E V S)

Rynarzol (Chem. Laboratorium Berlin Norden G. m. b. H. Berlin) a nerve, anemia and

weakness remedy, contains calcium glycerophosphate, hemoglobin, vanillin, cocoa, sucrose and flour — *Pharm Zentralh*, 76 (1935), 338 (E V S)

Salzchlirfer Reducing Pills (Dr W Dernbach, Apotheker, Bad Salzchlirf), a cathartic and fat reducing pill, contains ext rhubarb, ext cinchona, ext aloe, ext cascara sodium taurocholate *Ipomoea tupa* resin and Carlsbad Salts — *Pharm Zentralh*, 76 (1935), 338 (E V S)

Sanovin (Homöopathische Centralapotheke, Prof Dr Mauch, Goppingen) is a homeopathic preparation containing fennel, plantago, drosera *Castanea vesca*, anise, thyme, cratagus stramonium, bryonia, ipecac, potassium sulphoguaracolate and antimony arsenate It is used for coughs and bronchial catarrh — *Pharm Zentralh*, 76 (1935), 339 (E V S)

Schachttox (F Schacht G m b H, Braunschweig), which is marketed in two strengths, is a concentrated pyrethrum preparation The first strength diluted 100–200 times is used for plant lice, while the second is used as a house yard and stable spray for all vermin — *Pharm Zentralh*, 76 (1935) 339 (E V S)

Scillergon Tablets (F J Kwizda, Korneuburg), in packages of 12, consist of the standardized active constituents of squill with pimpinella root — *Pharm Post* 68 (1935), 213 (H M B)

Scilloral (Asta A -G, Chem Fabrik, Brackwede i W) is a patented heart remedy prepared from squill and is marketed as cachets, suppositories and in liquid form — *Pharm Zentralh*, 76 (1935), 307 (E V S)

Sedocalcium occurs in the trade in the following combinations Iodo sedocalcium as tablets of 0.25 Gm sedocalcium and 0.02 Gm potassium iodide, Theobromine sedocalcium 0.025 Gm sedocalcium and 0.2 Gm theobromine, Iodo sedocalcium-theobromine 0.25 Gm sedocalcium, 0.2 Gm theobromine and 0.1 Gm potassium iodide These preparations are used for hypotonicity, arteriosclerosis and asthma — *Pharm Monatsh*, 16 (1935), 76 (H M B)

Sensibamine (Chem Fabrik Dr Georg Henning, Berlin-Tempelhof) is a new ergot alkaloid The increased uterus action due to the alkaloid occurs in 1–2 minutes after intravenous injection or in 10 minutes after subcutaneous injection It is taken after childbirth to promote the return to normal of the uterus — *Pharm Zentralh*, 76 (1935), 227 (E V S)

Silikat-Hautsalbe (Chem Fabrik Hygiea G m b H, Dresden) an ointment of lanolin and silicic acid, is used for frost-bite, skin eruptions, pimples red nose and face — *Pharm Zentralh* 76 (1935), 227 (E V S)

Silikat-Milchpuder (Chem Fabrik Hygiea G m b H, Dresden), a dusting powder containing silicic acid in an easily absorbable form, is indicated for wind burn, skin itch, wet eczema and inflammation — *Pharm Zentralh*, 76 (1935), 227 (E V S)

Solvarsin (I G Farben A G) contains 22.4% aqueous solution of 4-oxy 3 acetyl amino phenylarsenic acid amino ethanol in packages of five 2-, 3- and 5 cc ampuls — *Pharm Post*, 68 (1935), 212 (H M B)

Solvochin-Calcium-Ampullen (Chem -pharm A -G, Bad Homburg) contains in each 5 cc ampul 250 mg of quinine corresponding to 1 cc of Solvochin and 72 mg of calcium as calcium glutamate which is dissolved by means of phenyldimethylpyrazolon The pH of the liquid is 7.2 It is indicated for croup pneumococci pneumonia bronchial pneumonia, postoperative pneumonia and other conditions due to pneumococci — *Pharm Zentralh*, 76 (1935) 307 (E V S)

Stabal (Papatin Apothecary of Aba Sztankay v Hermany, Debreczin) is compound quinine ethylphenylbarbiturate and contains ethylbarbituric acid 41.687% quinine 56.376% strychnine 1.936% in chemical combination It is used as a hypnotic and sedative in doses of 0.05–0.15 Gm for epilepsy for children 0.01–0.02 Gm three times a day, for adults in treatment of the same disorder 0.05 Gm three times a day with a maximum dose 0.2 Gm For severe insomnia 0.05 Gm are given in morning and at noonday (or 1 pastille) and at evening if necessary 0.10–0.15 Gm (2–3 pastilles) It is a bitter, insoluble white powder easily soluble in alcohol, m p 181–182° C — *Pharm Monatsh* 16 (1935) 12 (H M B)

Stovarsol Sodium (Société Parisienne d'Expansion Chimique Spezia, Paris) is the sodium salt of oxy acetyl amino phenylarsenic acid in ampuls containing 0.50–1.0 Gm — *Pharm Post*, 68 (1935), 210 (H M B)

Styptoplast (Firma Lohmann A -G) (formerly Luscher & Bömper A -G) is the new name for Clauden-Wundverband — *Pharm Zentralh*, 76 (1935), 339 (E V S)

Toxursan (Chem Fabrik Dr Ch Thaler, Wien) is a lithium containing condensate of terpenes and unsaturated fatty acids. It is used as a local treatment for rheumatic and gouty maladies—*Pharm Zentralh*, 76 (1935), 227 (E V S)

Treupel Suppositories (Chem pharm A-G, Bad Homburg) contain in each suppository a 1-Gm Treupel tablet, 0.5 Gm of phenacetin, 0.25 Gm of acetylsalicylic acid and 0.02 Gm of codeine—*Pharm Zentralh*, 76 (1935), 227 (E V S)

Tussipebt Tablets (P Beiersdorf and Co, Vienna), in packages of 32, contains amino benzoic acid ester, menthol, anisol, primula saponin—*Pharm Post*, 68 (1935) 213 (H M B)

Tutopon (Bayer) ampuls, suppositories, tablets and solution contain 1-2% total alkaloids of opium—*Pharm Post*, 68 (1935), 210 (H M B)

Urginin (Calco Chemical Co), formerly known as Scillonin, is a cardiac tonic derived from two of the active glucosides of squill and the clinical value of the product has been thoroughly demonstrated in the treatment of decompensations, cardiovascular renal disorders—*Drug and Cosmetic Ind*, 36 (1935), 775 (H M B)

Uric Acid Cachets (Pharm Handelsgesellschaft m b H, Dusseldorf) is a yellow colored powder consisting of oxgall (as dry substance 50%), phenylquinoline carbonic acid 30%, hexamethylenetetramine 20%. It is used for rheumatism gout etc—*Pharm Monatsh*, 16 (1935), 98 (H M B)

Vermitrapp-Suppositories (Dr Schmidtsche Apotheke Inh Otto Trapp, Tubingen), a vermifuge, containing iodoform naphthalene thymol and cocoa butter—*Pharm Zentralh*, 76 (1935), 307 (E V S)

Wolarin Tablets (Borussis-Apotheke, Ed Patermann, Berlin-Schoneberg) contain in each tablet ext valerian (5%), calcium carbonate (1%), quinine hydrochloride (0.5%) menthol (0.1%), phenacetin (25%) and acetylsalicylic acid (68.4%). It is used for influenza, rheumatism, gout ischias, head and nerve pains—*Pharm Zentralh*, 76 (1935), 339 (E V S)

BACTERIOLOGY

Antipneumococcic Serum—A New Method of Titration of, by the Neutralization of the Antibodies in Vitro Assay methods *in vivo* are inconvenient and lacking in precision. Methods *in vitro* for the assay of anti-toxic serums do not give a true measure of the therapeutic activity. References to these are cited. The principle of the new method is to find the maximum volume of serum which a known weight of dry antigen is able to deprive of its antibodies. A constant weight of pneumococcic antigen is placed in contact with varying volumes of serum. The presence of antibodies in the centrifuged liquid is detected by the addition of pneumococcic gum which causes precipitation. The method is given in detail. The authors hope to apply the method to those serums such as antistreptococcic, antimeningococcic and antigonococcic which are impossible or difficult to test with animals—LOUIS COTONI and JACQUES POCHON *Compt rend*, 200 (1935) 2039 (G W H)

Disinfection—Fallacies and Dangers in Attempted Chemical According to the author iodoform is not a disinfectant at all. It can be added to bacterial cultures in quantity without in any way interfering with their growth, if it is placed in the bottom of a tube of broth, colonies of streptococci will grow on it. Mercurochrome is a grossly overrated substance which deceives by its color just as iodoform deceives by its smell. Results of experiments show that concentrations of mercurochrome necessary for bactericidal action are very much greater than those indicated by the original work of Young, whose results are vitiated by the fact that he made his test dilutions in acid urine. The following is a statement of the concentrations of mercurochrome which, according to different observers will or will not kill *Staphylococcus aureus*

Observer	Dilution	Conditions	Time of Exposure	Result
1	1 10,000	In urine	15 mins	Killed
2	1 400	In blood	24 hours	Failed to kill
3	1 400	In broth	24 hours	Failed to kill
4	1 50	In water	10 mins	Failed to kill
5	1 100	In water	15 mins	Failed to kill

Among disinfectants most resistant to interference by organic matter are phenol and cresols, which are consequently well suited for disinfecting excreta, and flavine is one of the most reliable antiseptics for many surgical purposes. On the other hand, the emulsion of acriflavine (B P Codex 1934) is an example of the incorporation of a disinfectant in an unsuitable vehicle. This emulsion can be poured in quantity on to fluid culture media and left there indefinitely without interfering with bacterial growth. The emulsion is so constituted that none of the flavine diffuses into a watery medium in contact with it, unless the two are briskly shaken together in a corked tube. Most disinfectants are liable to cause subtle and invisible damage to the tissues if only by immobilizing leucocytes, but some destroy tissue to an extent which can be seen and felt. Among the latter we have principally to consider disinfectants of coal-tar origin. Phenol is the most caustic of all substances which have been used as disinfectants in medicine. The cresols are somewhat less toxic and rather more bactericidal. Some bacteria such as the tubercle bacillus and sporing bacteria, are more resistant than others to any disinfectant. But apart from these special types, there is endless and wide variation in the susceptibility of different bacteria to the action of a single disinfectant. These variations are not the expression of a general vulnerability in the bacterial cell, since a micro organism which is easily killed by one disinfectant may be almost indifferent to another. It is suggested that a weak solution of a disinfectant may stimulate bacterial growth, and this is particularly likely when disinfectants are injected intravenously in septicemia. If so, ineffective measures are not merely indifferent—they may be dangerous.—L P GARROD *Pharm J*, 134 (1935), 323 (W B B)

Mold Fermentations—Apparatus for the Application of Submerged, under Pressure A new apparatus is described. It consists essentially of a revolving drum equipped with internal buckets and baffles and provided with means for the introduction and removal of air under pressure.—H T HERRICK, R HELLBACH and O E MAY *Ind Eng Chem*, 27 (1935), 681 (E G V)

4'-Sulfamido-2,4-diamino-azobenzene Hydrochloride—Curative and Preventative Action of, in Experimental Streptococcus Infection Mice intraperitoneally infected with *Streptococcus hemolyticus* survived six days when 4' sulfamido 2,4-diaminoazobenzene hydrochloride (rubiazol) was given *per os* in a single dose of 0.005 Gm for a 20 Gm mouse. Survival was extended to from 10 to 17 days when the same dose was given subcutaneously. Some curative action was shown by repeated injections. Rubiazol shows a preventative action if the infection takes place within 48 hours after the preventative treatment. It stops the multiplication of the streptococci without total destruction of the microbes.—CONSTANTIN LEVADITI and ARON VAISMAN *Compt rend*, 200 (1935), 1694 (G W H)

BOTANY

Acorus Calamus—Seed and Seedling of This species appears to be sterile in Europe where it has been naturalized. This is also true of plants introduced from Europe. In Minnesota where it appears to be native the plant fruits abundantly. The fruit is a 3 celled, gelatinous berry containing usually 5-7 orthotropous ovoid somewhat angled seeds pendant from an axillary placenta. The cylindrical embryo lies in the axis of the endosperm, which is surrounded by a thick callous perisperm. The seed coat is made up of a thin tough tegmen surrounded by a thicker testa. In germination, the tip of the cotyledon remains as an haustorial organ and lifts it into the air. The seedling immediately becomes green, develops absorbing hairs and is early independent. The single vascular bundle of the cotyledon passes directly down into one pole of the diarch root while the midrib of the first plumular leaf is directly continuous with the other pole.—MURREY F BUELL *Botan Gaz* 96 (1935) 758-765 (G W F)

Brazilian Euphorbiaceæ—Essential Oils from The N O Euphorbiaceæ is represented in Brazil by 62 genera and almost 900 species. The author describes a few of the species derived from recent research work.—F W FREISE *Perf and Ess Oil Rec*, 26 (1935), 219 (A C DeD)

Cytisus Scoparius—Natural Distribution of, in Virginia with Special Reference to Soil Reaction The plant was found to favor soil with a pH from about 6 to 6.7.—THOMAS W TURNER *Bull Torrey Botan Club*, 62 (1935), 331-335 (G W F)

Datura Stramonium and D Metel—Fertilization of, in the Incompatible Cross The fertilization process is discussed. The incompatibility is apparently caused by disintegration of

the cells of the endosperm and proembryo—SOPHIA SATINA and A F BLAKESLEE *Bull Torrey Botanical Club*, 62 (1935), 301-310 (G W F)

Drug Plants—Evaluation of Cultivated, in 1934 The experience resulting from the cultivation of domestic drug plants is described and the results of numerous determinations of the active principles of various plants are tabulated. Investigations show that peppermint leaves usually average 1.3-1.6% of oil, *Coriander sativum* 0.41-0.5%, Russian coriander 0.41-0.6% and Thuringer coriander 0.31-0.4%. In the alkaloid containing plants, belladonna leaves yielded 0.6-0.83%, hyoscyamus leaves 0.39-0.65% and stramonium leaves 0.44-0.75%. Both *Thymus vulgaris* and hyoscyamus yield a greater percentage of active principle before flowering than after flowering—K H BAUER *Pharm Zentralh*, 76 (1935) 281 (E V S)

Drug Potency—Fluctuation of, during Growth The authors present a study of the factors affecting the quantity of active constituent of the following drugs: *Mentha piperita*, *Thymus vulgaris*, *Melissa officinalis*, *Digitalis lanata*, *Hyoscyamus niger* and *Datura stramonium*. The drugs were carefully collected at regular intervals, dried, assayed and the results graphed. A series of hot, dry, sunny days causes the ethereal oil content of the drugs to decrease, whereas similar weather causes an increase in alkaloidal and glycosidal content of the drugs. Similar studies applied to other drugs should lead to the cultivation of a better grade of drugs—O DAFERT, W HIMMELBAUR and K LOIDOLT *Scientia Pharm*, 6 (1935) 45 (M F W D)

Leaves A comparative anatomical study of various official leaf types including the functional aspects—H SOMMER *Pharm Zentralh*, 76 (1935) 150, 159 (E V S)

Matricaria—Italian and Hungarian To discover the cause of the superiority of commercial Italian matricaria to the Hungarian drug, the author grew some from Hungarian seed side by side with some from Italian seed. The flowers were collected at the same time and dried under the same conditions. The Italian flowers yielded 0.7865% of a clear blue, well flavored essential oil, those from Hungarian seed yielded 0.469% of a brownish-green oil of not too pleasant an odor. He therefore concludes that the Italian and Hungarian plants are different varieties—G BISCARO *Boll chim farm*, 73 (1934), 758, through *Quart J Pharm Pharmacol*, 8 (1935), 138

Rhubarb—Culture of Chinese The cultivation of two species, *Rheum palmatum* (L.) Tsch and *R. cordifolium* nov spec, is described—A TSCHIRCH *Apoth Ztg*, 50 (1935), 42, through *Chem Abstr*, 29 (1935) 42

CHEMISTRY

GENERAL AND PHYSICAL

Medicinal Chemistry—Contributions of An outline of early and recent accomplishments and objectives of the future—C R ADDINALL *Ind Eng Chem*, 27 (1935), 533 (E G V)

Salt Hydrates—Vapor Pressure and Dehydration of Unstable Sodium Perborate A study is made of the factors influencing the rate of dehydration of salt hydrates. A partial explanation of the mechanism of dehydration is given, and equations are developed which give the rate of dehydration for hydrates having different rates of nucleus formation. The influence of temperature, air pressure, air velocity, depth of material and area exposed and size of particles on the rate of dehydration is evaluated. When sodium perborate is dehydrated at 50° to 60° C until there is a loss in weight equivalent to 3 molecules of water or 35.5% there is a gain in available oxygen up to 15.7% which corresponds closely to the expected 16.2%. By prolonging the dehydration at 60° to 65° C, or on heating to a higher temperature for a shorter time, the color of the residue changes to a weak yellow at lower temperatures and to a definite yellowish color at higher temperatures. There is some loss in oxygen and water, and when the product is put into water, gaseous oxygen is evolved. The violence of the action and the amount of oxygen evolved depend upon the time and temperature of heating—T I TAYLOR and G G TAYLOR *Ind Eng Chem*, 27 (1935) 672 (E G V)

INORGANIC

Mercury—New Method for Its Dry Purification A current of cotton-filtered air at atmospheric temperature is passed through the mercury for 4 to 5 hours. On leaving the mercury the air is cooled and passed through a tower of activated bone char containing iodine which completely absorbs entrained mercury. This gives a technically pure product suitable for gages, etc. To obtain a product suitable for thermometers (at least 99.6% purity), continue passing air and

gradually raise the temperature to 105°C in 2 hours, keep at this temperature for at least 15 minutes, and filter repeatedly through paper cones perforated with a fine hole. C P mercury has a brilliant surface, when 100 cc are shaken for 15 minutes in a white 1-liter flask the surface must not be covered with a dull film. The method is economical, simple and free from danger, and the mercury retained by the char or the impurities can be recovered easily.—ZIENER *Glas U Appar.*, 15 (1934) 187-189, through *Chimie & Industrie*, 33 (1935), 1118 (A P C)

ORGANIC

Alkaloids

Apoquinine and Apoquinidine Demethylation of quinine with either aluminum chloride or 60% sulphuric acid yields so called "apoquinine," which the authors have found to be mainly a mixture of apoquinine and chlorodihydroapoquinine. This mixture forms a dihydrochloride and a zincchloride, the latter on repeated recrystallization from concentrated hydrochloric acid becomes constant in composition and physical properties. By repeated recrystallization of crude apoquinine and its acid diamsol *d*-tartrate from methyl alcohol and acetone, pure chlorodihydro apoquinine and apoquinine free from chlorine have been obtained. Well crystallized and apparently pure quinidine of commerce usually contains 20 to 30% of dihydroquinidine. Using specially purified quinidine of 99.5% purity the authors have obtained, by demethylation, two new substances—isoapoquinidine, $\text{C}_{19}\text{H}_{22}\text{O}_2\text{N}$ colorless hexagonal prisms melting point, 245°C $[\alpha]_D^{15}$ 12.6° ($c = 1$ in alcohol) or $+25.6^{\circ}$ ($c = 0.78$ in *N*/10 sulphuric acid), and apoquinidine a dextrorotatory crystalline substance yielding well crystallized salts, which is difficult to purify and is still under investigation. Formulae and physical constants of a number of bases and their salts are given.—T A HENRY and W SOLOMON *J Chem Soc Lond* (1934) 1923, through *Quart J Pharm Pharmacol* 8 (1935) 116

Corynanthine—Constitution of Corynanthine and yohimbine are *cis-trans* isomers. The methyl and ethyl esters of the base obtained by the saponification of corynanthine with potash, as well as the apo derivative, are identical with the corresponding derivatives prepared from yohimbine. The author suggests that the name pseudo corynanthine applied by Raymond Hamet (*Compt rend*, 199 (1934), 1658) to the base obtained by saponifying corynanthine with alkali be stricken from the literature.—CAESAR R SCHOLZ *Compt rend* 200 (1935), 1624 (G W H)

Ergobasine, New Water-Soluble Alkaloid of Ergot About 0.06 Gm of this new alkaloid ($\text{C}_{19}\text{H}_{23}\text{N}_3\text{O}_2$) can be obtained from 1 Kg of commercial ergot. It has been possible to extract a few grams of pure crystalline ergobasine in the commercial manufacture of ergotamine and ergotoxine. It is obtained by extracting finely powdered ergot with water and exhausting the aqueous extract with chloroform from which the ergobasine crystallizes upon concentration and can be purified by recrystallization from trichlorethylene or benzene. It can also be obtained by dissolving a mixture of the total alkaloids of ergot in chloroform, when a certain concentration is reached the ergobasine crystallizes out. It crystallizes in right angled prisms. The aqueous solution (1-200 or 300) is alkaline to litmus with an intense bluish fluorescence. It is very soluble in ethyl and methyl alcohol, readily soluble in ethyl acetate, 1-5000 in cold and 1-750 in hot chloroform. Recrystallized from alcohol and dried to constant weight it softens at 159° and decomposes at 162° . A 0.25% aqueous solution has a rotation of $[\alpha]_D^{20} = +90^{\circ}$. The solutions are sensitive to light and air which without doubt accounts for the variation in the strength of the galenical preparations. While the reactions with the general alkaloidal reagents are positive, it can be distinguished from ergotamine by the concentrations necessary. These two alkaloids are the only two extractives from ergot to give crystalline salts. Ergobasine merits a thorough pharmacological study, it bears a resemblance to the ergometrine of Dudley and Moor but is sharply distinguished from the latter being dextro while ergometrine is laevogyrate.—ARTHUR STOLL and ERNEST BURCKHARDT *Compt rend* 200 (1935) 1680 (G W H)

Ergometrine—Isolation of Ergometrine discovered by Dudley and Moor (*Brit Med J*, 1 (March 16 1935), 521) is appreciably soluble in cold water and moderately soluble in chloroform, benzene and dichloro-ethylene, from which it may be recrystallized. The specific rotation of the material recrystallized from benzene in 0.1% solution in chloroform is -45 degrees and a provisional analysis gives the values C 71.46, H 7.38, N 11.66%. Ergometrine gives the dimethyl

aminobenzaldehyde and glyoxylic acid color reactions common to the known ergot alkaloids. The long delay in the discovery of ergometrine is due to its having no distinctive pharmacological properties, so far as has yet been determined, and the chemical isolation has been dependent on clinical tests throughout. The importance of ergometrine is obvious enough, but certain conclusions drawn by the discoverers seem to be too hasty. The action of ergometrine is sudden and vigorous, and subsides in two hours, it cannot maintain continuous contraction when given only three times a day. The action of ergotovine, on the other hand, is much more persistent. Dudley and Moir argue that since the effect of a single dose of ergotovine administered by mouth, even as large as 2 to 3 mg, does not begin for thirty five minutes, and is relatively feeble, oral administration of ergotovine is useless. But oral administration of ergotovine three times a day for several days may be far from useless, the full effect may not be obtained for three or four hours after the first dose, but thereafter it may be maintained by the repeated doses throughout the puerperium without interruption. To suggest, as Dudley and Moir do, that ergotovine may possibly be undesirable in preparations for oral use is surely against the weight of the present evidence.—J H BURN *Pharm J*, 134 (1935), 357 (W B B)

Holarrhena Antidysenterica—A New Alkaloid from the Bark of The drug is used in Burma as a remedy for dysentery and as a febrifuge under the name of lettok. The alkaloidal content of the bark was 1.2 to 1.36%. The alkaloids were extracted with cold dilute hydrochloric acid, cold alcohol, and hot alcohol. A second extraction with alcoholic ammonia yielded an extra 0.1 to 0.2%. When the alkaloids were separated in the usual manner an alkaloid ($C_{17}H_{15}O_2N$) giving a hydrochloride soluble in water, but sparingly soluble in hydrochloric acid was found. The base purified through the hydroiodide (m p 256° -decomp) was obtained as a light brown powder (m p 350 – 352°). It does not appear to be identical with any of the alkaloids previously described as present in the bark and the name *lettocine* is suggested. It appears to be a tertiary base and to contain no hydroxyl groups. The amount present in the bark is less than 0.1%. No alkaloids were found in the latex, but alcoholic extraction yielded two crystalline solids of the resinol type. The chemical constants of alkaloids previously reported are reviewed.—D H PEACOCK and J C CHOWDHURY *J Chem Soc* (1935), 734–735 (G W F)

Ipecac Alkaloids—Distribution of, in the Rubiaceae. The roots of *Remyia Amazonica* Schum yield 0.75–0.82% of emetine, 0.43–0.62% of cephaeline, 2.22–3.18% of oleoresin (a skin irritant and drastic), 0.035–0.055% of ethereal oil, 1.65–1.92% of fatty oil, 1–2.2% of saponin and 14–18% of tannins. It is also known as *Poaya brava*. In *Ferdinandusa Elliptica* Schum var *Belemensis* Ducke, the outermost roots yield 0.88–0.96% of emetine, 0.26–0.33% of cephaeline, 0.02–0.035% of psychotrine and a trace of ethereal oil. The plant grows along the shores of Paraguay and Peru where it is used for dysentery. *Tocoyena Longiflora* Aubl, a native of French Guiana and Brazil, contains in its roots 1.31–1.66% of emetine, 0.62–0.68% of cephaeline, 0.02–0.08% of psychotrine and some oleoresin. *Caperona Decorticans* Spruce, the roots of which are found in many patent medicines, yields 0.68% of emetine, 0.74% of cephaeline, 0.11% of psychotrine, 5–8% of a yellowish red coloring principle and about 11% of tannins. The yellowish white bark of *Bohrriospora Corymbosa* Hook, also known as *Ipeca lisa*, contains 1–1.35% of emetine, 0.10–0.22% of cephaeline, and a trace of psychotrine. The stem bark of *Hulia Illustris* (Vell.) Schum, an epiphyte, yields 1.11–1.37% of emetine without any accompanying alkaloids. A short botanical description and the South American habitats of the above plants are included.—FRIEDRICH W FRIESE *Pharm Zentralh*, 76 (1935), 223 (E V S)

Kola-Nut—Cultivated in Brazil. The fresh Brazilian kola nut contains water 40, caffeine 1.41, theobromine traces and mineral salts 1.96%. Its caffeine content is about the same as that of African nuts.—V VARGAS *Bol assoc brasil pharm*, 15 (1934), 250, through *Chem Abstr*, 29 (1935) 4129

Lévornine (Adrenaline) A review of the methods of preparation of natural and synthetic adrenaline. The assay and standardization of adrenaline are discussed.—LAPINÉ and LAVOYE *J pharm Belg*, 17 (1935) 485–488, 507–509 (S W G)

2-Phenylquinoline-4-carboxylic Acid—Quinine Salt of A tasteless product is obtained by preparing the salt as described in German Patent 563 457 but at any convenient temperature, and then washing it at 60 – 70° with water, benzene or other liquid in which it is also sparingly soluble.—R and O WEIL, chem-pharmazeutische Fab German Pat 611,235 (Mar 25, 1935), through *Chem Abstr*, 29 (1935), 4134

Physostigmine—Synthesis of II It has already been reported that desoxydinoreseroline and desoxy-9-methyldinoreseroline are obtained by reacting Grignard compounds of tryptamine or α -methyltryptamine with methyl iodide. By using 5 ethoxy- and 5 methoxytryptamines, it has now been found, dinoreserthole and -methole, which serve as starting materials in the synthesis of eserine, may be obtained. Optical resolution of dinoreserthole was realized by means of *d* bromocamphorsulphonic acid and *d* tartaric acid. Since methyl- β (5 alkoxy 3 indolyl) ethylamine may be the starting point for the synthesis of eserine, this possibility was tested by mono-methylating tryptamine. On reacting the methyl iodide with tryptamine, only the quaternary iodide was obtained. Then benzyldenetryptamine was reacted with methyl iodide, but instead of the expected secondary base, two new substances were separated: 3-phenyl-3,4,5,6 tetrahydro-4-carboline and 3-phenyl-4-methyl-3,4,5,6 tetrahydro-4-carboline-iodomethylate.—T. HOSHINO and Y. KOTAKE *Ann*, 516 (1935), 76, through *Squibb Abstr Bull*, 8 (1935), A-594.

Senecio—Alkaloids of Barger, *et al*, isolated an alkaloid related to senecifoline and senecifolidine, from so called *Senecio latifolius* and from accurately identified *S. retrorsus* D. C. The compound was identical with the retrorsine (I) of Manske, melting point, 212° (Manske, 214–215°, cor.) readily soluble in alcohol, chloroform, slightly soluble in water, acetone and ethyl acetate, and hardly soluble in ether, and gave a monophenylcarbamate, melting point, 200–202°, a nitrate, melting point, 145°, a methiodide, melting point, 260° and a perbromide. Acid or alkaline hydrolysis of I yielded retronecine (II) and retronecic acid (III). II, melting point, 121–122°, contained neither OCH_3 nor N-CH_3 groups, did not react with nitrous acid and formed a quaternary iodide with methyl iodide probably being a tertiary base. It contained two reactive hydrogen atoms and gave a diacetyl derivative when boiled with acetic anhydride, which when catalytically reduced lost one acetoxy group and took up four hydrogen atoms. The authors could not demonstrate a ketone group in II. Catalytic reduction of I, II and the diacetyl derivative of II (IV) with platinum oxide gave rapid absorption of four hydrogen atoms. With palladium and hydrogen I and IV gave similar results but II yielded a substance which treated with mineral acid gave an analogue of pyrrole red and on further reduction gave retronecanol (V). Oxidation of V gave a compound with a methiodide of melting point, 292–295° C and was presumably derived from an acid $\text{C}_6\text{H}_4\text{NCO}_2\text{H}$ (picolinic?), but more material is required for identification. III was a dihydroxy dicarboxylic acid, $\text{C}_{10}\text{H}_{16}\text{O}_6$, melting point, 177°, and when heated with anhydrous oxalic acid for several hours, yielded a lactone acid, melting point, 181–183°. II and III may have been combined in I by two or by one ester linking, in the latter case the second molecule of water used up in hydrolysis would hydrolyze a lactone group.—G. BARGER, T. R. SESHADRI, H. E. WATT and T. YABUTA *J Chem Soc* (Jan 1935) 11, through *Squibb Abstr Bull*, 8 (1935), A 598.

Yohimbine Commercial preparations of yohimbine hydrochloride (I) were found to consist mainly of isoyohimbine (II) melting point, 239–240°, $[\alpha]_D$ in 1% pyridine = 108.5°. II was best obtained by heating I in aqueous alcoholic solution with tartaric acid, II tartrate, melting point, 252–253°, II hydrochloride, melting point, 298–299°. II was converted to isoyohimbic acid (III), melting point 268–269° by treating II with potassium hydroxide, acidifying with hydrochloric acid concentrating and precipitating with ammonium hydroxide. III methyl ester, melting point, 239–240°, III ethyl ester, melting point, 202–204°. Yobyryne, $\text{C}_{19}\text{H}_{21}\text{N}_2$ melting point, 217–218°, was hydrogenated in the presence of platinum oxide to decahydroyobyryne, $\text{C}_{19}\text{H}_{25}\text{N}_2$, melting point, 228–229°, picrate, melting point, 195–196°. Reduction of tetrahydroyobyryne gave octahydroyobyryne, $\text{C}_{19}\text{H}_{24}\text{N}_2$ (yobime), melting point, 177–178°, picrate, melting point, 220–221°, dehydrogenation with selenium gave yobyryne.—J. P. WIBAUT and A. J. P. GASTEL *Rec trav chim* 54 (1935) 85, through *Squibb Abstr Bull*, 8 (1935), A 678.

Essential Oils and Related Products

Aniseed Oil—Preliminary Report on Study of, from Kuangsi The seed of *Illicium verum* Hook produced in Kuangsi province, China, known as *Fruclius anisi Stellati*, contains 9% essential oil of which 92% is anethole. This essential oil has the following physical constants: d_4^{25} 0.979–0.970, n_D^{25} 1.5437–1.5407, α_D +1.5°, melting point 19.5–20°, solidifying point 15.5°.—CHIH HSU WANG *Chem Ind* (China), 9 (1934), 27, through *Chem Abstr* 29 (1935), 4123.

Citronellol-Rhodinol Isomerism—Study of, by Means of Raman Spectrography The Raman spectra, specific gravity, refractive index and specific rotatory power were determined for

citronellal (I) and citronellal (II) (both from Java oil of citronella), for citronellol obtained by reduction (a) of ethyl citronellate (III), (b) of citronellal by aluminum butyrate (IV), and (c) over nickel of the mixture of citronellal and geraniol from oil of citronella with the citronellol therein (V), and of rhodinol from Reunion oil of geranium purified by treatment with benzoyl chloride (VI). I, III and VI are mixtures of the α and β forms, β preponderating, no α is detectable in II, IV and V—Y. RENE NAVES, GEORGES BRUS and JEAN ALLARD *Bull Inst Pin*, (1935), 52-53 (A P-C)

Madagascar Clove Oil Survey of Primary Production The oil produced in Madagascar is derived mainly from clove leaves, only a small extent from clove stems. It is estimated that there are about 170 stills operating, about 100 in the Soanieriana District and 70 in Sainte Marie. A table showing the exports of Madagascar clove oil is included. Supplies of leaves are obtained by cutting out the growing top of the clove tree to a depth of about 3 feet, thus leaving a cup-shaped depression at the top of the tree. The oil from the distilleries is transported in large glass bottles, and purchased by European exporters or Chinese traders. Good Soanierana oil is reported to contain 85% eugenol—ANON *Perf and Ess Oil Rec*, 26 (1935), 204 (A C DeD)

Perfume Chemistry—New Procedures in A review—A. LEWINSON *Riechstoff Ind Kosmetik*, 10 (1935), 85-88, 104-106 (H M B)

Spirit of Turpentine—Oxidation of Tests were carried out on the oxidation of the tail fraction of spirit of turpentine in presence of galvanized iron, zinc and iron, respectively, as catalysts, and on American spirit of turpentine in presence of galvanized iron. The results confirmed that oxidation proceeds differently in presence of iron and of zinc as catalyst. In presence of zinc formic acid is the principal product formed, oxidation products that are present in old spirit of turpentine have long been known to act as catalysts, and having the same action as zinc. At high temperature (during distillation) their action is instantaneous and is accompanied by liberation of water. Use of galvanized containers for spirit of turpentine is therefore quite inadvisable. In presence of iron oxidation produces mainly resinic acids, which are partly insoluble in the liquid—J. TERPUGOFF *Bull Inst Pin* (1935), 6-10 (A P C)

Sweet Basil Oil A discussion of the botany, cultivation, distillation and chemical characteristics of oil of sweet basil (*Ocimum basilicum* L.) and a common adulterant, 'Reunion basil oil'. Chemical constants for genuine sweet basil oil were found to be sp gr (15° C) 0.914-0.935, opt rotat $-10^{\circ}50'$ to $-4^{\circ}8'$, sapon value 5.1-14.5, refrac index 1.4869-1.4929, alcohol content 33-41%—ERNEST S. GUENTHER *Am Perfumer*, 30 (1935), 183-185 (G W F)

Fixed Oils, Fats and Waxes

Fats—Antioxidants and the Autoxidation of Methods are described for estimating the length of the induction period of lard and lard cod liver oil mixtures by oxygen absorption for measuring the minute pressure changes occurring in a closed system during and immediately following the induction period, and for determining the peroxide content of autoxidizing fats by slight modifications of the usual thioisulphate titration procedures. The prolongation of the induction period by some natural antioxidants and several phenolic compounds is proportional to the amount used. At the end of the induction period the level of peroxide in lard or lard cod liver oil mixtures is fairly uniform irrespective of the length of the induction period or of the original peroxide content. With one natural inhibitor there seemed to be a mutual destruction of antioxidant and active peroxides. Some of the difficulties in obtaining reproducible data are discussed—R. B. FRENCH, H. S. OLCOTT and H. A. MATILL *Ind Eng Chem*, 27 (1935), 724 (E G V)

Halibut Liver Oil—Preservation of, with Hydroquinone Presence of an anti oxidant in cod liver oil retards absorption of oxygen, prevents loss of vitamin A and development of malflavors. Since halibut liver oil has a high concentration of vitamin A and requires special refining to free it from objectionable natural odor and taste, protection of an anti oxidant is important. The present report shows that hydroquinone greatly retards absorption of oxygen and loss of vitamin A in halibut liver oil. Experimental details reported include type of oils studied, preparation of the samples, testing of samples, vitamin A color unit, technique of the antimony trichloride vitamin A color test. Several tables and several graphs show results of experiments. Oils with out hydroquinone differ in susceptibility to oxidation, especially in the 'air' experiment. The same oils with hydroquinone do not differ appreciably in susceptibility to oxidation. An oil with 0.03% hydroquinone is quite resistant to oxidation. Since maleic acid inhibits oxidation of un-

saturated fats, oils, fatty acids and substances containing fatty material and tend to become rancid, a series of experiments was set up using it, but results were negative. The authors conclude that hydroquinone retards absorption of oxygen by refined halibut liver oil from air and from pure oxygen, and retards deterioration of vitamin A, as shown by color test and biological test—W S JONES and W G CHRISTIANSEN *J Am Pharm Assoc*, 24 (1935), 465 (Z M C)

Glycosides, Ferments and Carbohydrates

Folinerin A crystalline chemically uniform glucoside with complete digitalis action has been isolated from oleander leaves. It crystallizes from dilute alcohol in prismatic needles, melting point 249° , shows a specific rotation of $[\alpha]_D^{20} 45.95^{\circ}$, has an empirical formula $C_{23}H_{36}O_8$ (molecular weight 582) is relatively stable to dilute acids and seems to be related to Windaus "oleandrin," if not identical with it. On splitting off the sugar from this glucoside, a formerly unknown aglucone, oleandrigenin, $C_{23}H_{36}O_6$, is formed. This is isomeric with gitaligenin and like it, splits off water under energetic acid action to form digitaligenin, $C_{23}H_{36}O_3$. While in general the aglucones are much less active than the glucosides, in the case of this new glucoside, folinerin, its aglucone, oleandrigenin is superior to all the aglucones of the digitalis group in pharmacological activity. The cat unit (Hatcher Magnus method) is 0.25 mg/Kg. Folinerin is very active, a dilution of 1-500,000 producing tonic stoppage of isolated frog hearts and other typical actions of digitalis. On the intact heart, 1 mg folinerin is equivalent to 1200 frog doses. These values place it in the strophanthin group. The cat unit of folinerin corresponds to 0.24 mg/Kg (Hatcher Magnus). In cats the lethal dose is 0.2 mg/Kg subcutaneously, rectally 0.24 mg/Kg. The fact that the lethal dose with subcutaneous or rectal administration is so near the intravenous value (0.12 mg/Kg) points to the marked resorbability of the glucoside. This is in agreement with the markedly small molecule of folinerin. With regard to oral administration, it is of great importance that the glucoside is resorbable and resistant to dilute acids. As regards the cumulation of folinerin, it is easier to reverse its tonic stoppage of the isolated frog heart by washing than is the case with digitoxin. Furthermore, after a preliminary dose, the additional dose required to produce death is larger for folinerin than for digitoxin. Folinerin is very stable, an aqueous alcoholic solution showing no change in activity after three years' storage. In man, the glucoside is tolerated without any sequelæ whatsoever, to the extent of 1 mg which is considerably above the therapeutic dose—F FLURY and W NEUMANN *Klin Wochschr* 14 (1935), 562, through *Squibb Abstr Bull*, 8 (1935), A 764.

Glycyrrhizin Dilute alkali extract of licorice is treated with magnesium or calcium salt until there is no further precipitation. From the filtrate glycyrrhizin is separated by acidifying—KANEGAHUCHI BOSEKI K K (Toyo Ito, inventor) Japan 109,401 (Jan 29 1935), through *Chem Abstr*, 29 (1935), 3784.

Other Plant Principles

Calumba Root—Bitter Principles of The bitter principle, chasmanthin, a crystalline substance, $C_{20}H_{32}O_7$ has been isolated not only from the calumba root but from another calumba principle, columbin, on treatment with acids or alkalis. Chasmanthin is present in a high melting (265°) and low melting (212°) form, both of which can be transformed into the form usually found in the root *z e*, melting at 246° . Methylation of columbin as well as that of chasmanthin yields chasmanthin monomethyl ether. Columbin, $C_{22}H_{34}O_7$, melting point 182° (decomposition) is optically inactive as is chasmanthin. It probably contains a β lactone group, while chasmanthin seems to have two lactone rings. The thermal decomposition of columbin was studied—K FEIST, P RINTELEN and E KUNTZ *Ann*, 517 (1935), 119, through *Squibb Abstr Bull*, 8 (1935), A-729.

Hai-jen-tsao (Digenia Simplex Ag)—Chemical Study of Hai-jen-tsao, a variety of marine alga has long been used in China as a vermifuge. The alginate acid extracted by 2% sodium carbonate contains uronic acid and either glucuronic or mannuronic acid. The boiling water extract yields galactan, *d*-pararabin, a small amount of alkaloids and fucoidin which are subjected to detailed examination. It contains 0.20% of iodine—CHIH-FANG HSU *Science (China)* 18 (1934), 1418, through *Chem Abstr* 29 (1935), 4129.

Stramonium—Constituents of European Datura, Cultivated in China From air dried European *Datura stramonium* cultivated in China there were isolated, besides hyoscyne, hyoscy

amine and atropine, two neutral principles to the extent of 0.3%, *datugen* $C_{13}H_{10}O_2$, melting point, 295° , α 41.60° and *datugenin*, $C_{16}H_{12}O_6$, melting point, 265° , α 75° —T Q CHOU *Chinese J Physiol*, 9 (1935), 77, through *Chem Abstr*, 29 (1935), 4130

Valerian—Presence of α -Pyrrol Methyl Ketone in Stabilized The residues (2770 Gm) from the fresh rhizomes and roots of valerian stabilized with ethyl alcohol were employed. The filtrate obtained after distillation of the ethyl alcohol was washed with ether which left an acid residue with an odor of valeric acid, was neutralized with sodium carbonate (25%), and extracted with ether (357 Gm). The ether extract upon evaporation yielded a brown semi liquid mass, which was saponified with alcoholic potassium hydroxide (10%). The solution was concentrated, taken up with water, extracted with ether and from this residue (107 Gm) was obtained a liquid (10%) b_D^{25} $60-125^\circ$, which after further fractionation yielded a yellowish liquid (16%) b_D^{25} $68-73^\circ$, producing upon standing 0.2 Gm of a solid, crystallized from petroleum ether, melting at 90° , soluble in water and organic solvents. This was identified as α pyrrol methyl ketone by its oxime (melting point $144-145^\circ$), phenylhydrazone (melting point $143-144^\circ$) furacrylic derivative (melting point, $134-135^\circ$) which melting points agree well with those obtained for the derivative from the synthetic product —E CIONGA *Compt rend*, 200 (1935) 780, through *Chem Abstr*, 29 (1935), 3770

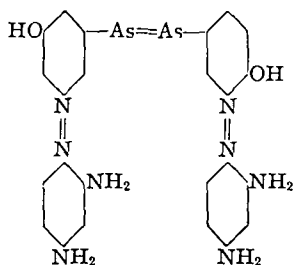
Unclassified

Arsenamides Compounds Containing the As-N Linkage Those who have investigated the reaction between arsenous halides and amines have given conflicting reports. These are discussed briefly. Work described in the present paper indicates that the reaction is more complex than previous work indicated. The earlier conflicting reports are due to failure to isolate all the products of the reaction. In nearly all reactions two or more products were obtained or indicated. The reaction between an arsenous halide and an amine takes place according to the following equations

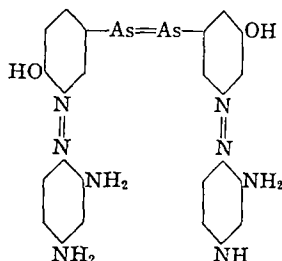
- 1 $AsX_3 + RNH \rightarrow X As NHR HX$
- 2 $X_2AsNHR HX + RNH \rightarrow X_2AsNHR + RNH HX$
- 3 $AsX_3 + 2RNH \rightarrow XAs(NHR HX)$
- 4 $XAs(NHR HX)_2 + 2RNH \rightarrow XAs(NHR)_2 + 2RNH HX$
- 5 $AsX_3 + 3RNH \rightarrow As(NHR HX)_3$

The course of the reaction is influenced by order of mixing strength of base and the arsenous halide used, possibly also certain steric effects. Under these varying conditions $As(NHC_6H_5 \cdot HCl)_3$, $Cl_2AsNHC_6H_5$, $As[N(CH_3)_2C_6H_5 HCl]_3$ were obtained. In addition to the arsenic compounds there is always a large amount of ammonium halide formed. Several types of compounds have been isolated. The type $XAs(NHR HX)$ and $As(NHR HX)_3$ are high melting solids, soluble in water, usually with decomposition and insoluble in organic solvents. They resemble ammonium halides in properties. Compounds of the type X_2AsNHR are high boiling liquids or low melting solids. They fume in the air and are decomposed violently by water. The name "arsenamide" is suggested for compounds containing the As-N linkage. So the following compounds prepared by the author are named $C_2H_5(I)As \cdot NHC_6H_5$ aniline ethylthioarsenamide, $Cl_2AsN(C_2H_5)_2$ diethylaminedichlorarsenamide, $As(NC_5H_{10} HCl)_3$ piperidine arsenetriamide trihydrochloride, $ClAs(NH \cdot CH_2 \cdot CH_2 \cdot NH HCl)_2$ ethylene diamine chlorarsendiamide dihydrochloride. Experimental work is reported and each of eleven reactions discussed in detail —G O DOAK *J Am Pharm Assoc*, 24 (1935), 453 (Z M C)

3,3'-Bis-(Azometa-Phenylenediamine)-4,4'-Dihydroxyarsenobenzene and 3,3'-Bis-(Azo-2,6-Diaminopyridine)-4,4'-Dihydroxyarsenobenzene—Preparation and Properties of Since it is known that certain azo dyes penetrate tissue readily and also that some have a definite trypanocidal action, it was decided to prepare some azo dyes from arspenamine base by diazotizing it and coupling with diamines. Arsono and arsono azo compounds have been described and some patents have been issued but none are of the type prepared by diazotizing arspenamine and coupling with metaphenylenediamine and with 2,6-diaminopyridine. The two substances prepared are named in the title and have the following structural formulas



(I)



(II)

Aqueous sodium hydroxide solutions of these compounds, injected intravenously into albino rats stained conjunctiva ears and abdominal cavities in the characteristic manner. Both compounds were much more toxic than other arsphenamines. The sodium salt of I was bacteriostatic to *B Typhoid* and *B Staphylococcus* in concentrations of 1-20,000. The free base was only slightly soluble in water but a saturated aqueous solution was bacteriostatic to both *B Typhoid* and *B Staphylococcus*. Both compounds seem too toxic for therapeutic use. Details of the experimental work are reported. Results of bacteriostatic and germicidal tests are tabulated.—A. E. JURIS *J Am Pharm Assoc* 24 (1935) 457 (Z M C)

5,5-Diphenylbarbituric Acid The compound, which cannot be prepared by the conventional method, was obtained in small yield along with a high melting, unidentified product, by the condensation of benzene with alloxan by means of sulphuric acid. It was tested intraperitoneally on rats and was found to be effective only in doses 6-8 times the effective dose of luminal. The effective doses invariably caused death.—S. M. McELVAIN *J Am Chem Soc*, 57 (1935), 1303 (E B S)

BIOCHEMISTRY

Barbituric Acid Derivatives—Determination of, in Urine Fifteen to twenty cc of urine are boiled with 0.2 Gm. norite and centrifuged warm. The clear supernatant liquid is decanted and the residue collected on a filter and dried. The residue is then warmed with 3 to 4 cc of absolute alcohol and 5 cc of chloroform and filtered. Two cc of this filtrate is cleared with absolute alcohol. 20 drops of 1% solution of cobalt nitrate in absolute alcohol and several drops of a 1% solution of potassium hydroxide in absolute alcohol added. In the presence of barbituric acid derivatives a blue color appears. Morphine, apomorphine and eukodal give similar reactions.—MOHRSCULZ *Munch med Wschr* No 18, through *Pharm Weekblad*, 72 (1935), 696 (C H W)

Benedict's Test—Modification of This method for the rapid determination of sugar in urine, is based on the depth of color of the filtrate obtained after heating 5 cc of Benedict's qualitative reagent with 0.5 cc of urine in a boiling water bath for five minutes. The color of the filtrate is compared with standards. If the urine contains 2.0% of glucose the 5 cc of reagent is just decolorized and the filtrate is colorless. In the presence of 0.4% of glucose in the urine would result in the decolorization of 1 cc of the reagent. The standard color for this amount of sugar is obtained by dilution of 4 cc of the reagent to 5.5 cc with water. A series of standards is prepared by diluting decreasing volumes of the reagent to 5.5 cc, each decrease of 1 cc of reagent will correspond to an increase of 0.4% of glucose in the urine. The accuracy obtained by this method is sufficient for clinical purposes.—J. FINE *Brit Med J*, 11 (1934), 167, through *Quart J Pharm Pharmacol*, 8 (1935) 133

Duodenin—Insulotropic Hormone of Intestinal Mucosa Extracts of the mucosa of the duodenum and the proximal part of the jejunum contain a substance 'duodenin,' which stimulates the secretion of insulin from the pancreas. Injected subcutaneously into rabbits, it causes a fall of blood sugar. It is also active if given by mouth. Pepsin does not affect the hypoglycemic action. By treating an extract with pepsin and hydrochloric acid, the action of 'secretin' which stimulates the external secretion of the pancreas, is abolished but the action of 'duodenin' on the internal secretion of insulin remains unchanged. Trypsin seems to reduce the activity of duodenin.—H. HELLER *Arch Exptl Path Pharmacol*, 177 (1935) 127 through *Quart J Pharm Pharmacol*, 8 (1935) 153

PHARMACEUTICAL ABSTRACTS

EDITOR A G DuMez, 32 S Greene Street, Baltimore, Maryland

ABSTRACTORS

WILLIAM B BAKER	CASIMER T ICHNIOWSKI
JOHN C BAUER	ROLAND E KREMERS
GERSTON BRUCH	CLIFFORD S LEONARD
ARTHUR H BRIAN	L LAVAN MANCHEY
HENRY M BURLAGE	ARTHUR E MEYER
ALBERT H CLARK	A PAPINEAU-COUTURE
ZADA M COOPER	HARRY ROSEN
GUSTAV E CVALINA	A S SCHWARTZMAN
AMELIA DeDOMINICIS	EMANUEL V SHULMAN
MELVIN F W DUNKER	EDGAR B STARKEY
GEORGE W FIERO	MARVIN R THOMPSON
PERRY A FOOTE	E G VANDEN BOSCHE
RALPH R FORAN	GLENN S WEILAND
SAMUEL W GOLDSTEIN	ANNA E WHITE
H B HAAG	ELMER H WIRTH
G W HARGREAVES	THOMAS G WRIGHT
WILLIAM H HUNT	MAX M ZERVITZ

CONTENTS

Chemistry	
Analytical	214
Toxicological Chemistry	224
Pharmacognosy	
Vegetable Drugs	225
Pharmacy	
Galenical	226
Pharmacopœias and Formularies	233
Non Official Formulæ	233
Dispensing	235
Pharmaceutical History	237
Pharmaceutical Legislation	238
Pharmacology Toxicology and Therapeutics	
Pharmacology	239
Toxicology	249
Therapeutics	251

ANALYTICAL

Acetone, *n*-Butanol and Ethanol—Analysis of, in Aqueous Solution Ten cc of distillate containing not more than 5 Gm of alcohols is diluted to 100 cc and 10 cc of this dilution is added to a cold mixture of 10 cc of 0.4*N* potassium dichromate and 10 cc concentrated sulphuric acid in a 2.5 by 25 cm test-tube. Two glass rods are dropped into the tube and the contents are thoroughly mixed. A stopper carrying a 1-mm capillary tube, the lower end of which is bent at right angles, is inserted and the tube placed in a vigorously boiling water bath. After 10 minutes it is cooled and diluted to 400 cc in a 1 liter Erlenmeyer flask. Fifteen cc of a 20% potassium iodide solution is then added, the flask is stoppered and allowed to stand 2 minutes, and the iodine released is titrated with 0.1*N* thiosulphate. A blank is run in the same way. The difference is designated as M_1 and has a value as shown by the equation

$$M_1 = 6.92B + 0.691A + 8.78E$$

in which M_1 is in cc of dichromate consumed, B is equal to the weight, in grams, of butanol, A the acetone and E the ethanol. A second titration is made to obtain another equation, and one of two procedures may be used. In one, a second oxidation, exactly like the above, is applied to a sample of distillate extracted with carbon tetrachloride. Twenty cc of the distillate is placed in a test tube with 40 cc of carbon tetrachloride, shaken, and allowed to stand 2 hours at 25° C. Ten cc of the aqueous solution is removed, diluted to 100 cc and 10 cc of this solution oxidized as above to obtain a value, M_2 which is given by the equation

$$M_2 = 2.75B + 0.386A + 8.22E \text{ plus correction}$$

Instead of extracting with carbon tetrachloride another equation may be obtained by carrying out the oxidation under different conditions. Ten cc of original distillate, containing not more than 2 Gm of alcohols per 100 cc, is diluted to 100 cc, and 5 cc of this dilution is added to a cold mixture of 25 cc of concentrated sulphuric acid and 10 cc of 0.4*N* potassium dichromate and the procedure for M_1 followed. A blank is run in the same way. The difference in titration is multiplied by two to give the value, N, shown in the equation

$$N = 24.62B + 17.68A + 8.84E$$

Then from the three equations the butanol, acetone and alcohol values may be calculated.—L. M. CHRISTENSEN and E. I. FULMER *Ind Eng Chem, Anal Ed*, 7 (1935), 180 (E. G. V.)

Acetylsalicylates—Decomposition of Acetylsalicylic drug mixtures kept in paper containers decompose on storing. Total salicylic acid was determined by hydrolyzing with alkali and determining the salicylic acid formed by bromometry according to Koppeschaar. The content of the preparations in free salicylic acid (*s. e.*, formed due to decomposition) was determined similarly without the previous saponification. As even pure acetylsalicylic acid decomposes under this treatment to some degree the value obtained for free salicylic acid should be diminished by 6.48%. Freshly made Kalmopyrine contained practically no free salicylic acid, a sample 6 months old contained about 12% and a sample stored for 2 years contained 44%.—V. GERVAY *Magyar Gyogyszeresztud. Társaság Értesítője*, 11 (1935), 241, through *Chem Abstr*, 29 (1935), 3776

Acid Indices of Official Oils and Waxes Lime Liniment of the Belgian Pharmacopoeia IV. The variations in the different methods for determining the acidity of fats and waxes recommended in the Belg. Phar. IV are pointed out and tabulated. The following changes in the paragraph relative to the technique used to determine the acid index are recommended. Dissolve 2 Gm of the substance in 20 cc of a mixture of equal volumes of neutral ether and chloroform and 5 drops of phenolphthalein, titrate with a 0.1*N* solution of alcohol potassium hydroxide to the appearance of a red color persisting for 15 seconds. The acid index is equal to the number of mg of potassium hydroxide used to neutralize the free acid of 1 Gm of the substance analyzed (1 cc of 0.1*N* KOH is equivalent to an acid index of 2.8056). Acid indices for the individual fats and waxes are recommended and since linseed oil is used in the preparation of lime liniment, the following change is urged. The acid index of linseed oil should be less than 2.2 (equivalent to 0.8 cc of 0.1*N* alcoholic KOH).—GARY P. WEIL and CLAIRE ANSELME *J. pharm. Belg* 17 (1935) 377-381, 399-401 (S. W. G.)

Alcohol—Determination of, in Tinctures A comparison of different methods of determination of alcohol in tinctures showed that sufficient accuracy could be obtained by the methods of the British, Swedish or German Pharmacopœias, the two latter being the simpler and more convenient. The British method is more troublesome and requires to be checked by a determination of the refractive index of the distillate. The British method (modification II) is very suitable for the determination of alcohol in tinctures containing ether.—A JERMSTAD and O ØSTBY *Norsk Farm Tidsskr*, 43 (1935), 4, through *Quart J Pharm Pharmacol*, 8 (1935), 122 (S W G)

Alkaloidal Salts—Estimation of, by Direct Titration of Their Acid Radicles The author describes a method which he has used since 1927 as a control method in the preparation of compressed and hypodermic tablets. The distinguishing characteristic of his method is the use of benzyl alcohol as the solvent instead of alcohol water solvents. A table showing some typical results would indicate that the method is quite satisfactory for the purpose intended.—FELICE A ROTONDARO *Am J Pharm*, 107 (1935), 237 (R R F)

Alkaloids—Determination of Application of the Mercurimetric Method to New Biological Products The mercurimetric method was successfully applied to determination of these alkaloids. They were precipitated from a 1% solution by the use of the Mayer-Valzer reagent (mercuric iodide alkaloid hydroiodide) and the complex destroyed by a mixture of nitric and sulphuric acids. The mercuric ion was precipitated by nitroprussiate and titrated with 0.1N sodium chloride. Tables of actual and theoretical equivalents are given. Apioi was detected by the following method also. To a mixture of 1 cc. of a 1% aqueous alcohol solution of the alkaloid and 5 drops of a 2.5% aqueous alcoholic phosphomolybdic acid solution was added 0.5 cc. concentrated sulphuric acid ($d = 1.84$), the mixture stoppered and shaken well. The color became an intense greenish blue changing to red orange on heating 2–3 minutes but returning to blue when cooled. Addition of 2–3 drops of 12% hydrogen dioxide before heating produced a yellow color which after heating changed to a persistent cerise. The reaction is sensitive to 1 mg.—A IONESCO-MATIU and C POPESCO *Bull soc chim biol*, 17 (1935), 671, through *Squabb Abstr Bull*, 8 (1935), A-745

Aloin—Examination of Three Samples Solubility tests were conducted on three samples of aloin, by saturating with excess solvent and macerating for forty eight hours with frequent shaking. These tests were done at ordinary laboratory temperatures, but under identical conditions in each case. A table is given which shows the results of these tests.—D B DOTT *Pharm J*, 134 (1935), 648 (W B B)

Alpha-Amylase—Determination of In order to calculate the concentration of alpha-amylase in a given enzyme preparation from the amount of starch liquefied under the specified conditions, the authors have introduced a new enzyme unit, the "liquefon," defined as "that amount of starch liquefying enzyme which will convert the standard starch paste at the rate of 25 mg. of dry starch per minute at zero time under the given experimental conditions." Since the rate at zero time is directly proportional to enzyme concentration, the number of liquefons per gram of preparation is an exact measure of the alpha amylase content. The actual procedure follows. The 150 Gm. sample of starch paste is cooled to about 19.5° C., so that after stirring in the enzyme infusion or the sodium chloride solution the temperature of the stirred paste is 21° ± 0.2° C. The correct time of stirring for the initial outflow is determined by running one or more blanks. Using this correct time, 15 cc. of enzyme infusion is stirred into 150 Gm. of paste and the mixture is placed in the bath at 21° C. After 59 minutes the mixture is sucked into the pipette and its outflow time is determined. The measurement of the outflow time of the mixture is begun just before the end of the hour reaction period in order to correct for the liquefaction occurring during the measurement. In order to check the stability of the paste, another blank should be run on 150 Gm. of paste which has stood for 1 or 2 hours at 21° C. The outflow time of this check blank should not deviate more than 3 or 4% from the first blank. In pipetting the 15 cc. portions it is necessary to avoid the introduction of saliva. A small cotton plug prevents contamination. From the outflow time of a given mixture the percentage decline is calculated, and from this the amount of starch liquefied is obtained from the table or equation. The enzyme content or activity of the infusion is derived from the amount of liquefied starch by means of the equation

$$\text{Log}_{10} L = (S - 1078) (0.000565)$$

where L = liquefons per 10 cc. of infusion and S = milligrams of starch liquefied in 1 hour. From

the concentration of the infusion the number of liquefactions per Gm. of preparation is calculated — S JOZSA and W. R. JOHNSTON *Ind. Eng. Chem., Anal. Edit.*, 7 (1935), 143 (E G V)

Aluminum—Sensitive Reagent for Separation of Aluminum and Beryllium The aluminum ion is precipitated in hydroalcoholic solution by ferrocyanides. The following reagent is recommended: Calcium ferrocyanide $12\text{H}_2\text{O}$ 20 Gm., distilled water 670 cc., alcohol (96%) 400 cc. Dissolve the ferrocyanide in the water, add the alcohol, shake, allow to stand and filter if necessary. Keep the reagent in a dark place. The sensitivity is 0.02 mg. aluminum per cc. The reaction is carried out by adding the sample to the reagent and heating to boiling for several seconds, the reaction goes better if the sample contains about 0.001 Gm. aluminum per cc. The same reaction may be used for quantitative determinations by nephelometry, potentiometry, gravimetric method (drying at $85-90^\circ$) and by determination of the excess of a known quantity of the reagent used, which may be done by manganometry using $N/10$ or $N/20$ solution, and in this case the sample should be in the form of the sulphate and the alcohol should be removed from the reagent by evaporation on a water-bath. The precipitate given by beryllium is more soluble than that given by aluminum and it may be separated by dilution and filtration, when the aluminum will remain as the precipitate — T. GASPAR and Y. ARNAL *Ann. chim. anal. chim. appl.* (Mar. 15, 1935) through *J. pharm. Belg.*, 17 (1935), 510 (S W G)

Ammonia and Amide Nitrogen—Determination of, in Plant Tissue The ammonia present in plant tissues as ammonium ions, that is the free or preformed ammonia, has been determined since 1850 by distillation with magnesium oxide, preferably *in vacuo*. A study of the possibilities of interference from a number of commonly found plant constituents and of the conditions under which this determination is usually conducted, has led to the suggestion of a technique that depends upon the distillation *in vacuo* with a borax sodium hydroxide mixture used in conjunction with a phosphate buffer solution. The ammonia is then nesslerized and determined in a Pulfrich spectrophotometer. Under these conditions, interference from other substances is minimal. The new reagent is particularly designed for determinations of ammonia in solutions to which phosphate buffers have been added, as the use of magnesium oxide is then inadmissible, its convenience, however, suggests that it may be generally applied with advantage — G. W. PUCHER, H. B. VICKERY and C. S. LEAVENWORTH *Ind. Eng. Chem., Anal. Edit.*, 7 (1935), 152 (E G V)

Antipyrine—Contribution to the microchemistry of Antipyrine sublimes with difficulty. If the sublimation is continued over an extended period of time crystals suggesting snow crystals are obtained. The reaction is not definite for quantities less than 1 mg. Antipyrine may be beautifully crystallized by taking up in water and adding very fine crystals of sodium chloride. This "salting out" process results in the formation of many prismatic crystals, right angled, six angled plates with an upper angle of 128° and side angles of 116° and oblong diamond shaped crystals with an acute angle of 66° . If nitric acid is added to a small quantity of antipyrine a beautiful color results which, however, disappears upon evaporation of the acid. When the acid is completely evaporated white crystals result which polarize light with a brilliant play of colors. The reaction is not very sensitive, 2 mg. being required for positive reaction. If antipyrine is first salted out and then a drop of sodium nitrite solution and a drop of hydrochloric acid are added, sea green crystals are obtained. This reaction is one of the best for antipyrine and has a sensitivity limit of 0.1 mg. and a dilution limit of 1:300. Potassium ferrocyanide followed by sulphuric acid results in star formations. In several places thin diamond-shaped crystals may be seen which have an acute angle of 82° (Limit 0.1 mg. dilution 1:200). Potassium ferrocyanide also gives beautiful crystals especially if the antipyrine is precipitated from diluted hydrochloric acid solution with the ferrocyanide and a drop of acetone added just previous to the precipitation. Needles grouped in star formations are found (Limit $\frac{1}{8}$ mg. dilution 1:200). Sodium nitroprusside gives excellent crystallization in acid solution (Sensitivity limit 0.1 mg. dilution 1:200). Platinum chloride gives yellowish crystals with acid solutions of antipyrine (Limit $\frac{1}{8}$ mg. dilution 1:200). If sodium iodide is added to the crystals obtained with platinum chloride a black mass of fine crystals is immediately formed. This soon changes to dark red with the formation of leather crystals — M. WAGENAAR *Pharm. Weekblad*, 72 (1935), 642 (E H W)

Arsenates—Volumetric Determination of The conditions necessary for the volumetric determination of arsenates by means of their reduction to arsenites by potassium iodide in the presence of sulphuric acid and titration of the arsenite formed by iodine in alkaline solution were

studied The three factors considered were the quantity of sulphuric acid and potassium iodide used and the duration of heating Correct results are obtained when the molarity of the arsenate solution, expressed in terms of arsenic pentoxide, lies between 0.0165 and 0.00099, if 2 cc. of sulphuric acid ($d = 1.8$) and 0.8 Gm. of potassium iodide are used for each 10 cc. of arsenical solution and if the duration of heating on the boiling water bath is about 10 minutes —M. F. TABOURY and H. AUDIER *Bull. soc. chim. mem.*, 1 (1934), 1570, through *Squibb Abstr. Bull.*, 8 (1935), A-748

Arsenic—Quantitative Determination of Small Amounts of An exhaustive investigation of the methods proposed for this determination is discussed and the following conclusions offered (1) The methods for the quantitative determination of the arsenic content in a preparation of fairly well known composition and that in a natural product are fundamentally different If no interferences are expected a simple oxidation titration method is satisfactory (2) The reduction to metallic arsenic by hypophosphite in strong hydrochloric acid solution is improved for this work (3) The methods which depend upon the isolation of the arsenic by means of the Schneider distillation procedure are not applicable because in these microchemical technique has not been sufficiently developed (4) For the quantitative determination of arsenic in a natural product the arsenic mirror formation or reduction by hypophosphite are methods that might be recommended In the reduction to arsine the use of zinc powder is preferred to granular zinc Any arsine remaining dissolved in the evolution flask is driven out simultaneously by a stream of hydrogen The arsenic mirror is dissolved in iodine monochloride solution and the separated iodine is determined volumetrically in strong hydrochloric acid solution in the presence of cyanogen with iodate Marsh's technique for the mirror formation is improved —J. GANGL *Pharm. Monatsh.*, 16 (1935), 87-92 (H. M. B.)

Arsenobenzenes—Chemical Examination of Arsenic was determined according to Schulek and Vilecz Schulek recently proposed use of two drops of 0.5% α -naphthoflavone as indicator in micro-determinations Samples of Revival and nearsphenamine contained 18.32-19.63% arsenic, 9.40-10.42% sulphur and 6.64-7.65% sulphur distillable with hydrochloric acid Solusalvarsan samples contained 1.883-1.917% arsenic Total sulphur content was determined according to Winkler after decomposition by nitric acid and hydrogen dioxide Sulphur distillable with hydrochloric acid was determined by method of Schulek and Dozsa —S. LASZLO *Magyar Gyógyszerészeti Társaság Értesítője*, 11 (1935), 266, through *Chem. Abstr.* 29 (1935), 3776

Benzene—Detection of, in Alcohol If the alcohol contains much above 0.01% benzene by volume it is diluted to approximately that value with alcohol free from benzene A 40 cc. portion is placed in a 100 cc. glass stoppered cylinder with 6 cc. of carbon tetrachloride Distilled water is added to the 90-cc. mark followed by 10 cc. of sodium sulphate solution (10 Gm. anhydrous salt to 100 cc. solution) The cylinder is stoppered, shaken and allowed to stand until the layers separate Five cc. of the bottom layer is transferred by pipette to a test-tube Three cc. of nitric acid (containing 70 Gm. of 20% oleum, 45 Gm. concentrated sulphuric acid and 43 Gm. of concentrated nitric acid) is measured in a small cylinder and added to the test-tube shaking During 10 minutes the tube is shaken twice more, and at the end of that time 20 cc. of distilled water is added rapidly from a cylinder After mixing by pouring into another test tube and back again the bulk of the water layer is decanted and discarded The lower layer is placed in an evaporating dish on an electric hot plate When the carbon tetrachloride is gone, the dish is emptied into the test tube just used, and is rinsed into this tube with 1 cc. of amyl alcohol The dish is then rinsed into the tube using 4 cc. of caustic soda solution (140 Gm. made up to 250-cc. solution) The tube is mixed by swirling and then 1 cc. of acetone is added, the tube swirled again and placed in a rack for observation of color produced in the top layer Pure benzene at the concentration of 1 in 10,000 by volume in rectified alcohol gives by this test a red color with a purple quality in the top layer This color holds for some hours and then fades to a dull orange red As the benzene content rises above 0.01%, the color produced soon becomes too dark for identification Pure toluene gives a slightly brownish yellow and reagent xylene produces a definite though not intense green which fades in 30 minutes, giving way to a dull orange Blanks should be run —A. C. LANSING *Ind. Eng. Chem., Anal. Edn.* 7 (1935), 184 (E. G. V.)

Calcium and Phosphorus Analysis—Digesting Biological Materials for Weighed samples of suitable size are placed in 500-cc. Kjeldahl flasks, 20 to 30 cc. of concentrated nitric acid is added and the flasks are then heated gently, with frequent stirring until the samples pass into a semi colloidal dispersion Heating to dryness must be avoided The heating should require about 30

to 45 minutes Ten cc of 70% perchloric acid is added and the flask placed over a free flame Very low flames are necessary during the perchloric oxidation When fuming begins the flame is so adjusted that only a trace of perchloric acid fumes reach the upper region of the flask The heating is continued until the solution is colorless or only a faint yellow color remains After slight cooling 50 cc of distilled water is added Vigorous boiling occurs driving out the remainder of the nitrogen dioxide fumes leaving a clear solution The solution is filtered into a volumetric flask and the Kjeldahl is thoroughly washed When the solution has cooled it is made to volume and aliquots are taken Calcium and phosphorus may be determined by the usual procedures—H W GERRITZ *Ind Eng Chem, Anal Edit*, 7 (1935), 167 (E G V)

Calcium Hydroxide—Solubility and Determination of Calcium hydroxide, obtained by slaking quicklime, comes into equilibrium with water after shaking for one hour and is much more soluble than the crystalline variety, at 15° C, the solubility of the former is 0.133% and of the latter 0.122%, calculated as calcium oxide The determination of calcium by weighing as oxide after precipitation as oxalate is subject to several sources of error, and should be discarded, accurate results may be obtained by the volumetric method using permanganate provided that the precipitated calcium oxalate is washed, before decomposition with acid with a saturated solution of calcium oxalate in water The author recommends the use of pure precipitated calcium carbonate as a volumetric standard, a weighed quantity of the carbonate being ignited to oxide in platinum, slaked and titrated with acid using methyl orange or methyl red as indicator—H BASSETT *J Chem Soc Lond* (1934), 1270, through *Quart J Pharm Pharmacol*, 8 (1935), 117 (S W G)

Camphor—Titrimetric Determination of, in Drug Preparations To substance equivalent to 0.2 Gm camphor (or hexetone) in a 100-cc flask add 0.15 Gm sodium bicarbonate, a drop of 0.1% bromophenol blue and 10 cc hydroxylamine hydrochloride (2 Gm dissolved in 10 cc water and 50 cc absolute alcohol) Heat the mixture with small flame for four hours under a short reflux condenser Cool, and add 10% hydrochloric acid until the blue color changes to yellow Prepare a blank in the same way and to each add carbon dioxide free 0.1N sodium hydroxide until a green color appears Then add solid phenolphthalein to each solution and further titrate until a lilac color is shown by both liquids The difference in no of cc required is equivalent to camphor content, each cc of 0.1N sodium hydroxide is equivalent to 0.0152 Gm camphor—R WOLSTADT *Magyar Gyógyszerészeti Társaság Értesítője* 11 (1935), 257, through *Chem Abstr*, 29 (1935), 3776

Cellophane and Kuprophane as Dialysis Membranes Cellophane No 300 (Kalle and Co) has a thickness of 20 μ and Kuprophane (Bemberg A G) 10 μ If the permeability of Kuprophane is 100 then cellophane is 51, and the parchment paper used for dialysis is 13 The membranes have sufficient strength when wet, and are satisfactory for rapid electro dialysis—H BRINTZINGER and H OSSWALD *Kolloid Ztschr*, 70 (1935), 198, through *Pharm Zentralh*, 76 (1935), 277 (E V S)

Chloride and Potassium Ions—Volumetric Microdeterminations of The chloride determination follows Samples of the order of 1 cc of 0.01N solution are titrated directly with 0.005N silver nitrate solution, using a 10-cc burette calibrated in 0.02-cc divisions The samples are conveniently contained in the cut-off end of a test-tube The conditions for a satisfactory end point with dichlorofluorescein are approximately neutral solution, not over 2 drops of 0.01% solution of indicator, acetone added in small amounts approximating the original volume of the sample and illumination from the side or rear of the observer For the determination of potassium excess of chloroplatinic acid solution is added to the sample and the solution is evaporated to dryness over a water-bath The residue is washed with successive portions of 80% alcohol and 20% ammonium chloride both saturated with potassium chloroplatinate The precipitate is washed into a crucible with 1 cc hot water The potassium chloroplatinate is reduced to chloride and platinum in neutral solution with finely divided magnesium The chloride set free is then titrated as described above—B BULLOCK and P L KIRK *Ind Eng Chem, Anal Edit* 7 (1935), 178 (E G V)

Chloroform and Carbon Tetrachloride—Reaction for Distinguishing between Papaverine hydrochloride is soluble in chloroform but insoluble in carbon tetrachloride Ten mg of papaverine hydrochloride (or any other alkaloid having this property) is added to one cc of the liquid (CHCl₃ or CCl₄) in which a small fragment of iodine has previously been dissolved If the liquid is chloroform the violet color will change to yellow or yellowish red, if it is carbon tetrachloride the

violet color will remain unchanged and the alkaloidal salt will not go into solution This reaction is suggested as a check to be used with other means of differentiation between these two liquids, e g, refractive index, etc —J ROZEDOOM *Pharm Weekblad*, 72 (1935), 689 (E H W)

Chromatographic Adsorption and Its Applications The method of separation by chromatographic adsorption, devised by the botanist Tswett, consists in passing a solution of the colored substances to be studied through a tower of finely powdered adsorbing material, the various pigments are adsorbed at different levels, and can be isolated and studied separately The method is described in detail, and various applications which have been made to date are reviewed Forty-one references —EDGAR LEDERER *Chimie & Industrie*, 33 (1935), 1072-1078 (A P C)

Cod Liver Oil—Vitamin Potency and Associated Characteristics of Average In order to determine the average quality of cod liver oil purchased in the retail market, 67 samples were obtained from various sources and sections of the British Isles The blue value, vitamin A and vitamin D values were determined The determinations were all made by approved methods The oils were divided into 5 groups according to localities and average blue values for each group determined Composite oils were prepared from 64 of the samples, a composite of samples below the median, one from those above the median, and one from a mixture of the latter two Blue values were determined directly in all cases and on the unsaponifiable portion in 36 cases Spectrophotometric examinations of 3 of the composite samples were also made The vitamin A and D values were determined on the composite samples A number of tables of results are given and the possible errors introduced by the methods used and also by the 'personal equation' are discussed The following conclusions are drawn by the authors The characteristics of average cod liver oil as obtained above are Blue value 9.3, blue value (unsaponifiable matter) 21.8, E 1.1% 328 μ 0.505, vitamin A (biological assay) 670.0 units per Gm, vitamin D (biological assay) 81.0 units per Gm The vitamin assays were based upon results from 40 pairs of rats for each assay It is calculated that the error in the vitamin A assay does not exceed -14 to +17% and that from the vitamin D assay -14 to +16% by a 22/1 chance —RONALD S MORGAN and HARRY PRITCHARD *Analyst* 60 (1935), 355-368 (A H C)

Copper—Determination of, in Foods with Special Reference to Milk A method for determining copper in foods is given in detail The original paper should be consulted for details Part of the authors' summary follows 1 Diphenylthiocarbazon in chloroform is used as an extraction agent to remove copper from foods 2 With milk containing 0.12 parts per million reliable duplicates may be obtained using as little as 20 Gm of milk The error is ± 0.02 parts per million 3 The method is applicable to foods in general and is unaffected by such metals as iron, tin, aluminum, lead, zinc, nickel and manganese 4 After all possible precautions to avoid contamination the copper content of sixteen samples of milk from cows of different breeds and different localities was found to range from 0.09 to 0.17 and a mean of 0.12 parts per million —N D SYLVESTER and L H LAMPTT *Analyst*, 60 (1935), 376-382 (A H C)

Coriander (Coriandrum Sativum)—Report on Examination of Samples of Indian and Foreign Different samples of Russian coriander contained approximately the same amounts (average 22.18%) of material soluble in petroleum ether, Moroccan, Tuticorin and local (Udamalpet) varieties were similar in their contents of ether extractives (average 20.11%) In fresh samples of all varieties the free fat acids amounted to 4.3-8.1 mg potassium hydroxide per Gm of oil, samples showing free fat acid values of 19.5 were definitely characterized as old stock The free fat acid values of the ether extractives of coriander constitute a valuable index of the quality and age of the product *New Method for Determining the Essential Oil Content of Coriander*—Extract 50 Gm of very finely powdered sample successively with 120 cc and 60 cc of 96% alcohol in two stages of 6 hours each at water-bath temperature, using a double-surface condenser Decant the first extract and press out the second extract as thoroughly as possible with a fine muslin cloth Dilute the combined extracts to 280 cc with distilled water and steam distil until the distillate is no longer cloudy Saturate the distillate with sodium chloride and extract with small amounts of petroleum ether Dehydrate the combined extracts with anhydrous sodium sulphate and filter into a flask containing a known amount of previously dried coconut oil Wash the sodium sulphate residue and the filter paper several times with anhydrous ether to remove traces of essential oils Remove the greater portion of the ether by means of a Soxhlet apparatus in a water-bath maintained at 45° and complete the removal of ether by drying *in vacuo* until the loss in weight is approximately 2 mg per 0.5 hour under 660 mm pressure The weight which is highest

in the series after attaining this steady loss in weight represents the combined weights of the essential oil, coconut oil and the flask. The method gives concordant results in duplicate determinations. The coconut oil prevents the volatilization of the essential oil during the removal of the ether. The oven-dry samples of Russian coriander contained approximately twice as much essential oil as the others.—B VISWANATH and C V RAMASWAMI *Ayyar Agr Live stock India*, 4 (1934), 583, through *Chem Abstr*, 29 (1935), 4130

Creatine and Creatinine—Microchemical Identification of The following methods for the differentiation of creatine and creatinine are given. 1 Crystallization of the sample from a drop of water on a slide and observation of the types of crystals formed. 2 Observation of crystals formed on addition of a drop of a saturated solution of picric acid or a drop of a solution containing 6 Gm iodine and 8 Gm potassium iodide in 150 cc instead of the drop of water in 1. The crystals are described and those from the first two procedures are illustrated. 3 Dissolve about 1 mg of the product in 1 drop of ammonia in a porcelain dish and add 1 drop of a saturated solution of picric acid. If the product contains creatinine, a persistent orange color develops, whereas with creatine the color of the mixture is the same as a control of ammonia and picric acid. If an orange tint which becomes stronger at first and then changes to yellow is observed, creatinine is present, the alkaline medium causing it to change to creatine. 4 Using a 1% solution of sodium nitroprusside instead of picric acid, a blood red color is obtained with creatinine and a faint rose color with creatine.—GEORGES DENIGES *Bull soc pharm Bordeaux*, 73 (1935), 89-97 (S W G)

Duododithymol—Assay of The tests and assay of duododithymol are critically reviewed. The following conclusions are drawn. The Belg Phar IV should retain the following points. 1 Modification of the formula for duododithymol according to Bougault (*J pharm chim*, 17 (1918), 221). 2 Color Yellowish red powder with a characteristic aromatic odor. 3 Solubility Insoluble in water and glycerin, slightly soluble in alcohol, almost completely soluble in ether, more soluble in chloroform, very soluble in benzene, test-limit of solubility in benzene (20 p). 4 Test of neutrality Aqueous filtrate neutral to litmus. 5 Moisture 1 Gm placed in a sulphuric acid desiccator for 24 hours loses at the maximum 0.01 Gm. 6 Mineral matter Calcination with sulphuric acid maximum of 3.5% of ash as sulphates. 7 Determination of mineral halides Assay limit with solution of silver nitrate, after exhaustion in the cold maximum 1% evaluated as potassium iodide. 8 Determination of organic chlorine Calcination with potassium hydroxide or carbonate and determination of the chlorine in the residue. 9 Free iodine Assay limit with N/10 hyposulphite maximum 0.25% iodine. 10 Iodate + free iodine Assay limit with N/10 hyposulphite maximum 0.50% iodine. 11 Determination of iodine Technique minimum 44% of the dried product.—LEON LECLERCQ *J pharm Belg*, 17 (1935), 423-428, 449-453, 467-471 (S W G)

Essential Oil Content of Drugs—Improved Method for Estimation of A detailed method for the estimation of essential oil content of drugs including a description of the method of operation of the apparatus, the condition of the sample before testing and the details of the distillation is given. A table is included which shows the amount of essential oil yielded by a number of samples of drugs, herbs and spices.—T TUSTING COCKING and G MIDDLETON *Perf and Ess Oil Rec*, 26 (1935) 207 (A C DeD)

Halides—Volumetric Determinations of Use of Dichlorofluorescein as an Adsorption Indicator Dichlorofluorescein has been used as an adsorption indicator in the argentometric titration of organic hydrochlorides dissolved in alcohol and inorganic halides in alcohol or aqueous solution. The analytical results have been within experimental error of the theoretical values on pure chemicals or of values obtained by the standard Volhard procedure on chemicals of ordinary commercial purity.—K BAMBACH and T H RIDER *Ind Eng Chem, Anal Ed*, 7 (1935), 165 (E G V)

Hexamethylenetetramine—Determination of, and Its Decomposition in Dilute Aqueous Solutions Re-examination of the method previously described shows that the micromethod without distillation is practically reliable especially for rapid determinations of hexamethylenetetramine in sugar containing drug mixtures. The distillation method naturally gives more exact values. Dilute solutions of hexamethylenetetramine may easily be decomposed during storage.—E SCHULEK and V GERVAY *Magyar Gyogyszeresztud Tarsasag Ertesitoje* 11 (1935), 272 through *Chem Abstr* 29 (1935), 3776

Insulin, Commercial—Rapid Method for the Determination of Purity of, in Vitro An acidified 0.2% solution of potassium ferrocyanide is a specific reagent for the precipitation of insulin from solutions. Several indifferent substances may then be precipitated from the insulin-free solution with picric acid. The authors have found that many chemical determinations depending on this principle may be made. These chemical determinations are useful and comparable with the physiological determinations.—I. I. NITZESCU and ST. SECAREANU *Bull. soc. chim. biol.*, 17 (1935), 118, through *Pharm. Weekblad*, 72 (1935), 696 (E. H. W.)

Iodine—Stability of Solutions of A study of the stability of solutions of iodine in various solvents. **Methyl Alcohol**—A solution of iodine in pure methyl alcohol showed only a very slight change in the analytical figures after keeping 160 days in a brown corked bottle, in the commercial pure alcohol some decomposition occurred. In both cases the odor of the solution showed the formation of iodoform, due to impurities in the solvent. Methyl alcohol is not recommended as a solvent for iodine. **n-Propyl Alcohol**—A 5% solution of iodine in n-propyl alcohol showed a considerable loss of iodine on keeping. When potassium iodide was also present the amount of decomposition was reduced, but was still considerable. **Glycerin**—A solution of iodine in glycerin showed no apparent change after keeping for one year. This also applies to a similar solution containing phenol. **Benzene**—A solution of iodine in benzene was found to have lost nearly all of its iodine after keeping for one year. Petroleum ether is to be preferred, the losses being much smaller. **Liquid Paraffin**—With pure liquid paraffin the strength dropped to about two thirds after a few days, and then remained constant. With a less pure oil the amount of free iodine dropped continuously. **Ether**—A solution of iodine in ether showed no change in strength after six months. **Chloroform**—A chloroform solution dropped, immediately after making, from 2.9% to 2.5%, and then remained constant in strength for six months. **Carbon Tetrachloride**—This solution is stable for at least six months. **Acetone**—In solution of acetone iodine forms iodoacetone which has been used as a poison gas. The strength rapidly drops and then remains constant. **Water**—Aqueous solutions, containing potassium iodide, are stable if kept in well-closed stoppered bottles, but not in corked bottles. **Tinctura Iodi Decolorata**—This is a very complex product which when first prepared contains ammonium iodide and duoamine. It decomposes rapidly, and should be eliminated from the Pharmacopœias.—W. HÖR. *Svensk Farm. Tid.*, 38 (1934), 422, 437, 457, 477, through *Quart. J. Pharm. Pharmacol.*, 8 (1935), 125 (S. W. G.)

Lactometer—New Type, Reading Total Solids The new lactometer herein described has a scale that reads directly in terms of percentage of total solids. The scale reading is predicated upon a butter fat content of 4% and is subject to a correction amounting to 1.2% of total solids for each variation of 1% of butter fat in the milk. Throughout its scale length the new lactometer is useful without correction for variation in the temperature of the milk provided its temperature lies between 58° F and 62° F. Where samples are at any temperature between these limits, or can readily be brought to have temperatures within these limits, this total solids lactometer will effect great economy of time in routine milk analysis. If the readings upon it lie between 11.2% total solids and 12.7% total solids, the temperature of the milk may range within the wider limits of 56° F to 63° F without any necessity of correction for temperature. The use of the total solids lactometer is not intended to do away with the check by gravimetric determination of total solids in all exceptionally important cases. Its use is merely a short cut in routine work. It is an instrument deliberately made to have the sensitivity conformable to routine milk analysis of to day, and deliberately made to give directly or after simple correction the figure (for total solids) that is otherwise arrived at indirectly by calculation through the general milk equation.—DAVID W. HORN. *Am. J. Pharm.*, 107 (1935), 212 (R. R. F.)

Methyl Salicylate—Determination of, According to D. A. B. VI The directions for assay are clear and understandable, but the results obtained are not uniform. Due to the small amount (1 Gm.) of methyl salicylate used in the assay, slight errors in weighing or measurements of reagents cause a high percentage of error. The use of alcoholic alkali as the saponifying agent gives a slower reaction than an aqueous solution and makes exact measurements more difficult. An assay based on the determination of salicylic acid produced a low result (95%). The difficulties encountered in the assay may be eliminated to some extent by increasing the amount of methyl salicylate to 2.5 Gm.—R. ECKERT. *Pharm. Zentralh.* 76 (1935), 237 (E. V. S.)

Micro- and Submicro-Colorimetric Determination of Iron The author recommends the

use of hydroxyquinoline for the determination of iron in organic liquids This method is based on the solubility of the ferric derivative of hydroxyquinoline in alcohol The solution is strongly colored a dark green and absorbs blue radiations, and may be used for colorimetric determination The reaction may be used for the determination of magnesium by finding the amount of hydroxyquinoline present by means of iron, and, from the hydroxyquinoline the amount of magnesium hydroxyquinolate—M J LAVOLLAY *Bull soc chim bel*, 17 (1935), 432, through *J Pharm Belg*, 17 (1935), 533 (S W G)

Micro-Copper-Pyridine Reaction—Application of, to Some Organic Acids The author has investigated the reaction used by Zwikker for the identification of barbituric acid derivatives adapting it to some of the organic acids The reagent consists of 4 cc of (10%) copper sulphate solution 1 cc pyridine and 5 cc of water When a few crystals of salicylic acid are introduced into the reagent crystal clumps, prisms and sometimes irregular hexagons are immediately produced The crystals are greenish blue and strongly birefringent Sodium salicylate gives an amorphous precipitate which soon resolves into the above described crystals When acetyl salicylic acid is introduced into the reagent the drop remains clear Upon scratching with the platinum needle, however, crystallization takes place with the formation of purplish blue prisms, rhomboids and hexagons The crystals are dichroic Calcium acetylsalicylate gives similar crystals after scratching Benzoic acid or benzoates give birefringent, dichroic (colorless to blue) prisms which soon resolve into stellate groups Cinnamic acid (dissolved in a little ammonia) gives rosettes of blue green prisms which later form into plates Anisic acid gives oblique dichroic prisms showing birefringence (colorless to blue) The prisms finally grow into stellate groups Anthranilic acid gives elongated birefringent hexagons and disk-shaped crystals Fumaric acid gives blue crystal clumps Dr Steenhauer states that the reaction is particularly valuable in distinguishing between salicylic and acetylsalicylic acids Seven photomicrographs are given—A J STEENHAUER *Pharm Weekblad*, 72 (1935), 667 (E H W)

Microsublimation as a Pharmacopœial Test The author comments upon the various microsublimation tests applied by the Swiss Phar V Some are practical but others are not accurate and could not be confirmed by the author Sixteen pharmacopœial tests are considered Microsublimation is really unnecessary for pharmacopœial purposes since chemical identification is more easily accomplished in other ways and is more convenient for the pharmacist—ROSEN THALER *Schweiz Apoth-Zig*, 73 (1935), 273 (M F W D)

Opium—Comparison of Proposed Methods The authors, constituting the Group Committee on Opium Assays of the U S P Committee on Revision criticize the opium assay procedure suggested by the International Committee Although this latter committee's method yields results which check satisfactorily, the lack of sharpness in the end point, the absence of any time saving factors, the potential hazard attending the use of smaller quantities of samples (especially in the case of gum opium), the apparent inaccuracy of the correction factor and the inconstant variations in results obtained by different collaborators combine to establish the fact that the proposed international committee's method is inferior to the method recommended by the group committee for adoption in the U S P XI—A RICHARD BLISS, JR *et al Am J Pharm*, 107 (1935), 193 (R R F)

Organic Matter in Plant Material—Destruction of, by the Use of Nitric and Perchloric Acids Place a 4-Gm sample of the material to be oxidized in a 400 cc beaker and add 10 cc of concentrated nitric acid Cover the beaker with a watch glass and heat gently until any rapid initial reactions have subsided Then heat to boiling and boil until the contents of the beaker are almost dry Remove the beaker from the hot plate and add 10 cc of dilute nitric acid (1 to 1) and 10 cc of perchloric acid (70 to 72%) Replace the cover glass and heat very gently to a low boiling temperature, avoiding superheating Maintain this temperature until all organic material has been removed from the sides of the beaker and from the solution, which will be indicated by a colorless or slightly colored solution Remove the cover glass, allow the beaker to cool a few minutes and wash any adhering salts into the beaker If the cover glass is washed with perchloric acid, the contents of the beaker need not be cooled The above method is applicable to a wide variety of plant materials, calcium, magnesium, potassium and phosphorus are determined by standard methods—J E GIESEKING H J SNIDER and C A GETZ *Ind Eng Chem, Anal Edu* 7 (1935), 185 (E G V)

Paraffin Wax—Tensile Strength and Density at Various Temperatures The tensile or

breaking strength of commercial paraffin wax was investigated at temperatures between -10° and 30° C. It varies considerably with the temperature, reaching a maximum value of 32 Kg per sq cm at about 3° C. The density was also measured over the same temperature interval, below 25° C. it varies in a linear manner with the temperature, having values of 0.909 and 0.922 Gm per cc at 25° and 5° C, respectively. There appeared to be no direct relationships between the two quantities measured—W F SCYER and K INOUE *Ind Eng Chem*, 27 (1935), 567 (E G V)

Peppermint Oils—Detection of Japanese Mint Oil in The following test for the detection of inferior Japanese oils in oil from *Mentha Piperita* is given. The oil (0.1 cc) measured in a 1-cc pipette (graduated in 0.01 cc) is mixed in a test-tube with 5.0 cc of a 2% solution of freshly redistilled aniline in glacial acetic acid, added from a burette. The reaction mixture is examined in a 1-cm cell of a Lovibond tintometer (B D H pattern) after an interval of 10 minutes. The reaction mixture must be protected from bright light. The presence of furfuraldehyde in the Japanese oils causes a red color having a red value of 4.5 to 7.4 when determined as above. Other oils also give some red color which varies somewhat for different types of oils (French, English Italian, American, etc.) but is very constant for each type and in all cases is much lower than the Japanese, rarely exceeding a value of 1.0. A rough quantitative estimation may be made of the extent of adulteration. Numerous tables are given showing results obtained with various types of true oils, with adulterated oils and with mixed samples of known composition. These results seem to be very satisfactory and conclusive—D C GARRATT *Analyst*, 60 (1935), 369-376

(A H C)

Phenolphthalein—Irreversible Fading of Besides the known reversible fading of phenolphthalein, an irreversible fading has been observed and investigated. It takes place on long keeping and is important when the indicator is used as a color standard. The effect is attributed to the formation of a tertiary carbinol carbonate ion and its subsequent reaction with hydroxyl ion, since the phenomenon is not observed with phenoltetrachlorophthalein which does not form the tertiary ion—A THIEL and G COCH *Z anorg allgem Chem*, 217 (1934), 254, through *Squibb Abstr Bull*, 8 (1935), A 666

Pyramidon—Microchemical Reactions for The author gives the following microchemical reactions for pyramidon. Pyramidon is not sublimable and identification by this method is impossible. Crystallization by precipitation is best accomplished by the process of salting out. A few grains of sodium chloride are added to an aqueous solution of the substance which causes it to crystallize in prisms often exhibiting refractive coloring longitudinally. The reaction is not particularly sensitive (0.1 mg). Mayer's reagent causes a precipitate soon resolving itself into yellowish white prisms with angles of 60° and 120° . Recrystallization from acetone improves the reaction. 0.05 mg (1:200) may be detected. Potassium cadmium iodide and potassium zinc iodide give similar reactions. With platinum chloride beautiful crystals are obtained. These are colored violet by an oxidation product of pyramidon. The reaction works well in a 1:100 solution having a minimum sensitivity of 0.1 mg. Gold chloride gives yellow needles and rosettes which are colored black upon the addition of nitric acid. (Limit 0.05 mg dilution 1:200) Picric acid gives prisms. Sensitivity 0.1 mg dilution 1:200. Para nitro phenol results in beautiful needles (Limit 0.1 mg dilution 1:200). Iodine potassium iodide gives an excellent crystallization especially when acidified with hydrochloric, sulphuric or acetic acid. Upon the addition of a few drops of acetone two kinds of crystals may be seen, one woolly and yellowish and one prismatic (Limit 0.02 mg dilution 1:200). Bromine potassium bromide gives green needles with an acidified 1:100 pyramidon solution. The reaction is not very sensitive. Chinosol gives green needles in stellate formation (Limit 0.2 mg dilution 1:100). Chinosol gives no trace of crystals with antipyrine and by means of this reaction 1% of pyramidon in antipyrine may be detected. Recrystallization from acetone is not necessary in this case—M WAGENAAR *Pharm Weekblad*, 72 (1935) 612

(E H W)

Red Pill (or Opium Substitute) The author gives in detail a method for the determination of heroin and morphine in a type of pill used for smoking purposes by addicts. Originally the pills were encountered in Shanghai but were later discovered in narcotic raids in the United States. They are very crude of variable physical and chemical constitution and the work of detecting and determining narcotic alkaloids entails a great deal of tedious analysis, mainly because only traces of heroin and morphine are present, mixed with a host of other innocuous but troublesome materials—PETER VALAER *Am J Pharm*, 107 (1935), 199

(R R F)

Sterols—Behavior of, toward Digitonin Tests showed that only those sterols with a hydroxy group on carbon atom No 3 in the same steric position as in cholesterol, which do not have too great a variation in the side chain give precipitates with digitonin —E FERNHOLZ *Z physiol Chem*, 232 (1935), 97, through *Squibb Abstr Bull*, 8 (1935) A 598

Surgical Dressings Criticism of Some of the Codex Standards The first point which appears to merit criticism in the new Codex concerns the adopted abbreviation for gram (g) The symbol employed in the B P (G) should have been selected in order to avoid the possibility of confusion between gram and grain For the convenience and easy reference of the majority, it is suggested that the English names for surgical dressings be given predominance The difficulties of the Dressings Sub-Committee in drawing up more stringent specifications might have been alleviated by stipulating that no consignment of any dressing should be condemned on one single examination In the absence of research revealing tests other than visual inspection, to attempt to describe a dressing in circumspect phrases is unsatisfactory The importance of the use of surgical dressings in the treatment of disease and the fact that most of them are invariably in contact with open wounds warrant the most exacting limits Another omission which might be remedied in subsequent editions of the Codex is the complete absence of "Actions and Uses" in the Surgical Dressings part of the book Throughout the whole section there is nothing to guide the apprentice In the opening paragraph of Part II it is puzzling to find the Codex condoning a common and abused practice by the statement 'substances are often added to the size (or filling) in order to increase the weight' without limiting such an offense to a definite percentage basis under the dressings concerned In the subsequent paragraphs on tests for moisture, water soluble extractive, foreign matter and cotton and wool it seems advisable to augment the 'dry at 100' by the addition of the words 'to a constant weight' The absorbing tests might also be improved as it is not stated how the dressing should be manipulated during compression —J BAIN *Pharm J*, 134 (1935) 747 (W B B)

TOXICOLOGICAL CHEMISTRY

Fluorine—Importance of Fluorinated Methemoglobin in the Determination of, in Industrial Hygiene The spectral absorption curve of fluorinated methemoglobin has a very intense maximum at $\lambda = 6100 \text{ \AA}$ Methemoglobin cannot be detected in presence of oxyhemoglobin in proportions of less than 25%, but if the methemoglobin is converted into its fluorinated derivative, the sensitiveness is increased to 10% Determination of the maximum optical density ($\lambda = 6100$) of the fluorinated methemoglobin affords a satisfactory method of determining fluorine that has been added to methemoglobin, within a range of 0.1 to 3 mg, and is therefore suitable for biological and toxicological analyses for larger amounts, standard methods are satisfactory —R FABRE and MELLE S BAZILLE *14me Congres de Chimie Industrielle Paris*, Oct 21-27, 1934 (A P C)

Humors—Chlorine Content of, after Death The chlorine content (expressed as sodium chloride) was determined in various organic liquids (26 samples of whole blood, 18 of blood plasma 10 of pericardial liquid, 9 of pleural serosities 7 of peritoneal liquid, 6 of blood from the liver) of 20 corpses, the samples in all cases having been taken not later than 48 hours after death In spite of wide variations in individual results, it is concluded that the chlorine contents of the various liquids are lower in the corpses than in the living organism the differences indicating that after death chlorine diffuses from the richer humors toward the poorer In diagnosing plasmatic hypochloremia by dilution of the blood of the cadaver (diagnosis of submersion in fresh water) such a conclusion must be based on a decrease in the chlorine content that is decidedly lower than the minimum that can be observed normally —CHARLES SOUTTER *Ann Med Legale Criminol Police Sci* 15 (1935), 385-405 (A P C)

Hydrocyanic Acid—Toxicology of Hydrocyanic acid absorbed by mouth or respiration can be identified in small quantities by distillation with dichromate and sulphuric acid The most suitable medium to receive the vapors is silver nitrate in ammonia Hydrocyanic acid is never formed by putrefaction or decomposition of tissues —PLUTARCO R ORELLA *Anales de Farm Bioquim* 6 (1935) 1 (A E M)

PHARMACOGNOSY

VEGETABLE DRUGS

Cinchona—In Amani A short historical survey of cinchona in Amani, Tanganyika Territory, is given. The alkaloid content of the various barks in different years is given, 10.55% quinine (as sulphate) in Ledger bark, and 11.21% in hybrid bark, being the highest obtained at any time. The yields of bark from the various species are given and results show that *C. ledgeriana* produces considerably less than the others. The market value of the various barks is discussed, and it is shown that the hybrid commands the best price per tree, *C. ledgeriana* having the lowest value. A description of the preparation and composition of cinchona febrifuges is given.—R. R. LE G. WORSLEY *Bull Imp Inst*, 33 (1935), 14-31 (A P-C)

Colophony—East Indian In Northern Sumatra, colophony and turpentine are obtained from *Pinus Merkusii*, the production in 1933 being 790 tons and 237 tons respectively. The colophony shows an acid value of about 193, compared with a range of 145 to 185 for the American product.—*Ber Afd Handelsmuseum Kon Ver Kol Inst* (1934) 35, through *Quart J Pharm Pharmacol*, 8 (1935), 284 (S W G)

Derris—Storage of Derris root, kept in a dry and cool place and not unduly exposed to light, undergoes no loss of rotenone on storage. If powdered, it should be kept in well closed containers. The rotenone content of the samples examined was determined by the ether crystallization method.—I. W. SPOON *Ber Afd Handelsmuseum Kon Ver Kol Inst* (1935), 90, through *Quart J Pharm Pharmacol*, 8 (1935), 284 (S W G)

Diatomaceous Earth—East Indian Deposits of diatomaceous earth in the Dutch East Indies are of four types: the Californian marine type, which occurs in a very pure form, the Hanoverian fresh-water type, two abnormal fresh water types consisting of curved hollow tubes and of long needles respectively. For the technical utilization of these it is necessary to decide which types are most suitable for particular purposes. In view of the cost of shipping such bulky material, it does not appear probable that export would be profitable.—E. C. J. MOHR *Ber Afd Handelsmuseum Kon Ver Kol Inst* (1934), 89, through *Quart J Pharm Pharmacol*, 8 (1935) 284 (S W G)

Euphorbia Prunifolia Jacq This herbaceous plant is common as a weed in the cotton fields of lower Egypt. The morphology and anatomy of the plant are illustrated. The analysis of the plant shows the presence of resins, a caoutchouc like substance, euphorbone and an acrid irritant vesicating principle. The plant possesses drastic purgative properties and is commonly used by the Egyptian fellahs for that purpose.—H. KAMEL and I. R. FAHMY *Rep Pharm Soc Egypt* 6 (1934), 29, through *Quart J Pharm Pharmacol*, 8 (1935), 285 (S W G)

Isapgula—Structure and Histology of Seeds of Plantago Ovata Forsk A detailed report on the anatomy and histology of the seeds is given, including descriptive illustrations. The following summary is given: 1. Ripe seeds of *Plantago ovata* are collected in the Punjab and N. W. Frontier Provinces of India. One hundred seeds weigh from 0.148 Gm to 0.195 Gm. They are "boat shaped" about 1.4 mm wide by 2.8 mm long. The dorsal surface of the majority of seeds in commercial samples is pale gray-brown with an elliptical central red-brown spot, in a smaller number in each sample the red brown spot is irregular in size and distribution or covers the whole surface. The furrow in the ventral surface represents the hilum and contains a whitish tissue of collapsed cell walls in which there are two elliptical red-brown gaps one on either side of its center which is dark in color. 2. The single seed coat consists of (a) The outer epidermis of large, colorless, mucilage cells with a cuticle, in contact with water they swell forming a mucilaginous jelly, three regions in the hemicellulosic mucilage of these cells have different staining reactions, the cells often contain starch grains, this epidermis does not extend beyond the edges of the furrow. (b) A layer of collapsed cellulose residues of about six rows of cells. (c) The inner epidermis of suberized cells with brown contents, the pigment layer, which completely invests the endosperm. 3. The cells of the endosperm have very thick cellulose walls with large simple pits. The embryo occupies almost the entire length of the seed; its cells as well as those of the endosperm, contain protein and oil. 4. When dead seeds are moistened with water, their embryos become blackened. 5. The variation in color of the seeds is due to the inclusion of a film of air in a split of varying extent in the collapsed layer of the testa, in India the splitting occurs naturally owing to changes in the humidity of the atmosphere. Seeds grown in England remain permanently brown.

The outer epidermis of the testa is easily separated from the remainder of the seed and constitutes Ispaghula Husks " 6 The mountants which render the cellular structures most clearly evident are aniline and clove oil —E W SKYRME *Quart J Pharm Pharmacol*, 8 (1935) 161-185 (S W G)

Opium—Jugoslavian A comparison of the work of several investigators shows that opium from this country has an average of 14.5% morphine and surpasses in content that obtained from India (8%), Egypt (9.3%) Russia (9.7%) Persia (10%) and Turkey (12%) A table of comparison of this drug from 84 Turkish sources and 105 Jugoslavian sources shows that one fourth of the Turkish samples have a morphine content of less than 10% and 86.7% of the samples had a content of 14% or less, only 15% of the Jugoslavian samples showed a content of less than 14% and 75.4% of the number had a content of 15-20% Adulterants were found to be acacia, starch, toasted bread, apricot and quince kernels The production in this country varies from 20,000-200,000 Kg annually —S BECKER *Pharm Monatsh*, 16 (1935), 85-86 (H M B)

Orobancha Ramosa, L This parasitic herbaceous plant is known in Egypt as 'Haluk.' The morphology and anatomy of the plant are illustrated It contains about 3% of mannite, a small quantity of sugars and tannins, traces of the glycoside orobanchin and its decomposition products, and high proportions of proteins, carbohydrates and ash The laxative properties for which this plant is used may be due to the mannite present —M A H MAHDI and I R FAHMY *Rep Pharm Soc Egypt*, 6 (1934), 35, through *Quart J Pharm Pharmacol*, 8 (1935), 286 (S W G)

Pharmacognosy Syllabuses—British and American, Compared The American pharmacognosy syllabus is considerably wider in scope than that of Great Britain and aims 'to include every crude vegetable or animal drug that the pharmacist is likely to be called upon to sell or dispense' Most of the drugs in the British Syllabuses are included in the American lists, exceptions being *Cera Flava*, *Creta Coca Mel* and *Sabina* The American syllabus embraces 305 drugs (151 primary and 154 secondary) while the British lists only 80 —G E TREASE *Pharm J*, 134 (1935) 680 (W B B)

Withania Obtusifolia, V Tack and W Somnifera, Dunal These two solanaceous species grow in Egypt The first has been recently discovered by Tackholm They closely resemble each other anatomically but have characteristic morphological differences Both of them appear to contain no solanaceous alkaloid —D Y HADDAD and I R FAHMY *Rep Pharm Soc Egypt*, 6 (1934) 41, through *Quart J Pharm Pharmacol* 8 (1935) 286 (S W G)

PHARMACY

GALENICAL

Alcohol—Concentration of, when Stored in Wooden Vessels The author stored 60 liters of 56% alcohol in a wooden barrel in a dry locality where the temperature was fairly high After eight years the alcohol content had increased from 56 to 75% He explains this by assuming that the wood of the barrel acts as a dialyzing membrane in which the water is absorbed, the alcohol behaving as a colloid The absorbed water finally evaporates from the outer surface of the barrel To prove his contention he placed a hydro alcoholic mixture in two barrels the outer surface of one being varnished The bung-hole of the varnished barrel was left open so as to allow some evaporation After four years the alcoholic content of the mixture was somewhat less The alcoholic content of the mixture in the unvarnished barrel however increased 4-5% in the four year period —P SAUVAITRE *Bull soc pharm Bordeaux*, 73 (1935), 111, through *Pharm Weekblad* 72 (1935), 826 (E H W)

Althea Leaves and Root—Evaluation of Many articles have been published basing the determination of mucilaginous drugs on viscosity measurements of the extract However, it is impossible to give a procedure which will be satisfactory for all mucilaginous drugs In preparing an extract of the principles of althea root a minimum of heat should be employed to prevent the solution of starch A 10% extract was prepared as follows The weighed amount of drug was lightly packed in a tall cylinder the necessary amount of water poured on, and allowed to stand at room temperature for one hour Every six minutes the contents were agitated by turning the cylinder through 360° on its horizontal axis It was then poured through cotton and then filtered clear through a double filter paper As the result of viscosity measurements run on numerous samples it may be said that the best results are obtained by macerating a drug all of which will

pass through a 1-mm mesh sieve for one hour at room temperature in a tall cylinder, shaking gently every ten minutes. An evaluation of althaea root is suggested. In the preparation of an extract of the leaves, it was shown that the drug should be powdered as finely as possible. Moderate heat increases the viscosity, whereas heating at water bath temperature causes a precipitate and lowers the viscosity. A determination for althaea leaves is also suggested.—E WALDSTÄTTER *Scientia Pharm*, 6 (1935), 61 (M F W D)

Cherry Laurel Water and Solution of Hydrocyanic Acid—Preservation of, by Paraffin Oil and Official Vaseline The concluding article on the preservation studies reported earlier (*J Am Pharm Assoc, Abstract Sect*, 29 (1935), 71). A vaseline layer superimposed upon the solution of hydrocyanic acid, protection against light and low temperature (refrigerator) give a stable preparation.—A GUILLAUME and G DUVAL *Bull sci pharmacol*, 42 (1935), 211 (C T I)

Chloroform—Preservation of, for Use in Anesthesia One per cent of absolute alcohol was added to chloroform and the product was kept at 20–26° C for 6 months in small colored flasks. On examination at the end of this period the product was clear and had an odor of pure chloroform. Tests for chlorides, chlorine, usual organic impurities, aldehydes, carbonyl chloride, etc., were negative. However, a portion of the above liquid gave positive tests for the impurities named after being subjected to light, and the author concludes that the product should be preserved by the addition of 1% of absolute alcohol and protection from light.—ADELE LISSIEVICI-DRAGANESCI *J pharm chim*, 21 (1935), 533 (M M Z)

Colloidal Silver (Protargol)—Researches on the Modification of the Physicochemical Properties of, with the Length of Time of Its Preservation Solutions of protargol are not equally preserved on storing. The concentration of these solutions is influenced but little by the variation of the degree of dispersion of the protargol, on the other hand the quality and the color of the glass of the bottles exercises a very sensitive influence, the greatest decrease in the degree of dispersion being observed when ordinary clear glass is employed. The presence of air likewise presents a considerable effect while its absence affects the degree of dispersion very little. From the sixth day of preservation on, the solutions of collargol showed traces of coagulation. However, from the twentieth day of preservation on a distinct diminution of the degree of dispersion was observed. The samples studied were composed of particles having diameters of 52–60 μ . The viscosity of the solutions varied according to the nature of the samples, the viscosity being the same when the solutions were of the same concentration. In the last case, the variation of the viscosity in the course of preservation was dependent upon the concentration, as soon as the latter was increased, the viscosity varied still more, it declined in a diluted solution, but increased in a concentrated solution (5–10%). The solutions of collargol presented clearly the properties of lyophilic colloidal solutions. The decrease in the viscosity of the solutions of collargol is in general parallel to the lowering of its degree of dispersion. Whatever may be the conditions of preservation, there is an increase in the coloration of the solutions. This variation is not parallel to the modification of the degree of dispersion. The maximum is produced when preserved in the presence of air. This fact is explained by the modification of the properties of proteins destined to stabilize the preparation.—I A FIALKOV and E M NATANSOHN *J Prikl Khim*, 7 (1934), 328–338, through *Chimie et Industrie*, 33 (1935), 674 (W A P)

Drug Extraction II The Effect of Fineness of Powder and of Variation in Solvents on the Percolation of Belladonna Root In connection with a general study of the fundamental principles of drug extraction, drugs of different types were used. The present report is concerned with the swelling of belladonna root in various solvents and the effect of fineness of powder in various solvents. Measurements were made (with a filar micrometer) of thin strips of cross sections before and after the addition of the solvents. A number of proportions of the following mixtures were tried: alcohol and water, glycerin and water, glycerin and alcohol. In hydroalcoholic liquids increase in alcohol reduced swelling. Alcohol alone had practically no effect. Glycerin alone caused gradual swelling. In mixtures with water, swelling increased with increase of water. For testing fineness of powder Nos 20, 40, 60 and 80 powders were used. For drug containing 10% of moisture, 90 cc of menstruum seemed best to render 100 Gm of drug "evenly and distinctly damp." U S P directions for percolation were used. Various fractions were assayed for total alkaloids and total extractive. Results are tabulated. Within the limits of No 20 and No 80 powder the fineness of powder was of minor importance. Several tables show the results of percolation with various alcohol and water mixtures. As the alcoholic strength in-

creases, extraction of alkaloids becomes more rapid and the yield of extractive greater Four proportions (alcohol 5, water 1, alcohol 4, water 1, alcohol 7, water 3, alcohol 1, water 1) have approximately the same efficiency, extracting substantially all the alkaloid Menstruum for U S P fluidextract appears to be well chosen Swelling of the belladonna is discussed in connection with the swelling of chestnut wood reported in a previous experiment—WILLIAM J HUSA *J Am Pharm Assoc*, 24 (1935), 446 (Z M C)

Drugs—Storage of, New Problems in The proper storage for drugs is of growing importance as shown by (1) The increasing skill in chemical manipulation which has led to the isolation from natural sources and the marketing of remarkably unstable substances with very definite and pronounced physiological action, whose existence was not even suspected twenty five years ago (2) The synthetic preparation of an increasing number of complex organic substances characterized by relative instability in particular the metallic organic medicaments (3) The introduction of new methods of administration, e g, parenteral methods, where the medicament is introduced outside the body's natural defenses, often in massive doses (4) The decomposition of drugs which may be initiated by methods of sterilization A study of the properties of insulin will indicate how easily substances of this class are inactivated Studies on vitamin A indicate that the factors essential for stability should be the absence of oxygen low temperature, choice of suitable vegetable oils as a solvent Vitamin C may be kept in preserved fruit juice which has been tyndallized in the absence of air Evidence collected shows that solutions of irradiated ergosterol in olive oil prepared under certain defined conditions and kept at 0° C retain their activity unchanged for two years but are liable to lose their activity slowly at room temperature It is important that preparation be carried out under well controlled conditions, as the stability of various makes appears to be different probably due to the difficulty of removing traces of oxygen during irradiation A knowledge of the stability of metallic organic compounds of arsenic, gold, bismuth, antimony and mercury is essential owing to the ease with which changes may occur in their constitution Special care must be taken to prepare fresh solutions of these metallic substances, and they should also be kept in an inert atmosphere Sterilization, bacterial infection, chemical changes oxidation, autoxidation and actinic reaction are other factors which influence stability—J C BOWEN *Pharm J*, 134 (1935), 351 (W B B)

Galenic Tinctures of D A B VI Intimate Knowledge of the Tincture The eight various menstrua used in the preparation of the 41 tinctures are listed with examples The official definition as given in the D A B is discussed literally Vinegars are also included *Types and reasons for the Spontaneous Changes in Tinctures*—For a complete understanding the knowledge of the causes of turbidity and of the deposits in the tinctures is necessary Likewise a knowledge of the solubilities of the constituents of the drug in the menstruum used and the temperature of manufacture is required Variation in temperature of the tincture stored may be different from that of the manufacturer but sufficient to cause a sedimentation Changes by oxidation and reduction may be due either to external factors such as sunlight, or internal factors, by certain constituents such as ferments, enzymes hormones or vitamins *Old and New Possibilities of Examinations*—The author cites physico physiological properties grouped to distinguish tinctures such as color, color and odor and color and taste Some tinctures possess all three attributes The comparison of the color tone to a color scale, e g, Ostwald color scale, is preferred The residue remaining after evaporation of the tincture may be used as a test The alcohol number, i e the cc of alcohol in 10 Gm of tincture determined after saturation with potassium carbonate, is a newly introduced test The author reviews certain documents on the history of the introduction of capillary analysis as a means of detection in pharmacy and cites Friedrich Goppelsroeder as the Father of Capillary Analysis—HERMANN KUNZ-KRAUSE *Pharm Zentralh*, 76 (1935), 174, 205 (E V S)

Iodine—Antiseptic Power of Certain Solutions of This is a confirmation of the work of LaWall and Tice and of Karns The tinctures of iodine usually employed are much too concentrated, the formula containing iodine 2 Gm potassium iodide, 24 Gm, and diluted alcohol (about 50%) a sufficient quantity to make 100 cc, possesses a raised germicidal power does not irritate the skin and penetrates easily has a saline concentration near that of the serum mixes perfectly with water and answers all needs—T SATRIANO *Ann Farm Biogum* 5 (1934), 37–50, through *Chimie et Industrie*, 33 (1935) 674 (W A P)

Iodine Ointment—Non-Staining During the course of the examination of a number of

samples of non staining iodine ointment a large variation in iodine content was noted. Investigations were carried out regarding the absorption of iodine by different bases under varying conditions. Iodine is only slowly absorbed by a base of melted vaseline (B. P. 1923) and prolonged heating is necessary to effect combination. This results in the loss of a large proportion of iodine, especially if an open vessel be used. The National Formulary (Great Britain) directs the iodine to be rubbed down with arachis oil in a warm mortar until solution is effected. Melted soft paraffin is then added and the whole thoroughly mixed. A sample made strictly according to these directions does not result in a non staining preparation. On heating there is a further gradual absorption of iodine by the base, but at the same time loss of free iodine occurs. The directions given by the B. P. C. 1934 are to mix the iodine with the arachis oil, add the yellow soft paraffin and heat gently with occasional stirring at a temperature not exceeding 60° until complete combination is effected, as indicated by the disappearance of the brown color. However, complete combination is not a practical proposition nor is it necessary in order to produce a non-staining preparation. Further, contrary to the B. P. C. statement, the disappearance of the brown color is not an indication of complete combination—the brown color disappears when the free iodine falls below about 0.7%. During the manufacture of the N. F. and B. P. C. 1934 ointments a dark brown resinous substance is produced which sticks to the sides and bottom of the vessel. The formation of this substance results in a serious loss of iodine, since 17.26% iodine was found in the alcohol soluble portion of the substance, and 4.46% iodine in the alcohol insoluble portion.—R. W. RICHARDSON
Pharm. J., 134 (1935), 589 (W. B. B.)

Kaolin—Emulsifying and Suspending Power of an Extracoloidal, "Kaolin Blanc Extracoloidal Suspensiv" (Gignoux & Co., Lyon, France). This product consists of particles 250 times smaller than the finest baryte and 20 times smaller than the regular colloidal kaolin, possesses unusual water absorptive power, remains suspended in water, stabilizes emulsions of both types inactive, tasteless and odorless. For liquid emulsions 1–5% is necessary, for pastes or thick emulsions at least 7% and it must always be added to the water. For concentrations to 7% an egg beater may be used to bring about dispersion, if mechanical stirrers are used concentration to 17% may be obtained. It is used as an absorbing, wetting and gelatinizing agent in various pharmaceutical and cosmetic preparations such as toothpastes, skin salves, antiseptics, disinfectants, for emulsification, suspension and dispersion of pigments, oils, waxes and resins, as an adhesive thickening and emulsifying agent for creams, face milks and liniments, as an extraction medium for pomades and drugs and in a dry condition for shampoos and face powders.—*Reichstoff-Ind. Kosmetik*, 10 (1935), 112 (H. M. B.)

Ointment Making. Bases include the two forms of wool fat, petrolatum, absorption bases from lanolin, benzoated lard, cold cream and greaseless bases from glyceryl monostearate or vanishing cream. Anhydrous is seldom used alone and petrolatum is added to it to make it spread easily. Ointments for the face, sunburns, etc., are often made with cold creams or greaseless cream bases. Lanolin and its bases are employed when quick penetration is desired, petrolatum when slow action is wished. Lanolin has supplanted benzoated lard which is not so easily absorbed and tends to become rancid. Hydrogenated oils as cottonseed are being used for tin ointments to which they impart good body, spreading qualities and sufficient absorptiveness for ordinary purposes. Waxes are added only to give body, beeswax is preferred since it makes the ointment less granular, cocoa butter is often added for emollient effect. Other bases used which are not so desirable are glycerite of starch and casein cream. The function of an ointment is to (1) promote healing, (2) allay pain and (3) protect the affected area from infection and the air. Effective antiseptics are mercury salts and phenols. The details of commercial manufacture are given—*ANON. Drug and Cosmetic Ind.*, 36 (1935), 687–688 (H. M. B.)

pH—Pharmaceutical Study of. This concludes a report begun in the previous JOURNAL, taking up first pH and stability of galenical preparations. A considerable number of the various findings are reported. With ergot preparations there are also contradictory statements. Confusion in literature is increased by the undependable results of various assay methods. Six investigators have concluded that pH of the fluidextract and alkaloid solutions should be adjusted to about 3.0 but they do not agree about which acid is best. Others think this figure questionable. Adjusting hydrogen ion concentration has been quite successful with aconite preparations. Swanson did the original work recommending that pH values of tinctures and fluidextracts be adjusted between 2.5 and 3.0. Among miscellaneous vegetable preparations which can be im-

proved by adjusting p_H are Compound Tincture of Gentian, preparations of veratrum, gelsemium, nux vomica and B P Compound Tincture of Cardamom. Scoville has studied a large number of tinctures of lesser importance, precipitation being increased in some, retarded in others. Miscellaneous chemical preparations have had considerable study. Some of these are Syrup of Ferrous Iodide and Syrup of Hydriodic Acid, solutions of arsenous iodide, solutions of potassium arsenite, Donovan's Solution, Solution of Iron and Ammonium Acetate, Iron and Ammonium Citrate, Solution of Magnesium Citrate. Fungous growths in Acid Solution of Phosphates can be prevented by addition of acid and precipitation in Compound Elixir of Glycerophosphates was reduced by addition of lactic acid. p_H affects color of Elixir of Ferric Pyrophosphate. p_H of Spirit of Ethyl Nitrite changed greatly during deterioration. Various hypochlorite solutions show much variation in p_H . There is evidence that hypochlorous acid ionizes in an amphoteric manner. p_H is an important factor in the stability of alkaloids during sterilization, p_H of solutions for injection must be stabilized to a value comparable to p_H of blood. Buffering to the physiological p_H , solutions of morphine, cocaine, tutocaine and larcocaine for injection is important. Decomposition of morphine at high temperatures and at different p_H values has had considerable investigation. Cocaine requires an acid medium for stability. Various investigations are reported. Dissociation constants for cocaine and its hydrolysis products have been determined. The results are given. Other alkaloids discussed are procaine, atropine, homatropine, cinchona alkaloids, hydrastine, physostigmine and pilocarpine. Miscellaneous organic compounds studied were sodium luminal, thiosulphates, benzyl alcohol solutions, urotropin solutions, strophanthin solutions, iodoform in solution, hydrogen peroxide solutions, phenol neocarsphenamine. Fundamental principles not yet of practical value have been established. Ions which are in an adsorbed state have reaction qualities different from free ions. Hydrogen-ion concentration measurements on synthetic solutions in connection with pyrophosphates have been of value. The presence of a transition point at p_H 4.3 between the two types of oxidation, addition of oxygen and evolution of hydrogen has been demonstrated. A number of p_H values for the maximum stability against hydrolysis of esters have been determined and some of these are given. Olivier has claimed that the influence of the hydrogen ion concentration upon hydrolysis is conditioned by the nature of the compound. A bibliography of more than 300 references is appended.—FREDERICK F JOHNSON *J Am Pharm Assoc*, 24 (1935), 498 (Z M C)

Pills—Adsorptive Properties of Substances Used in the Preparation of The author summarizes his work as follows: 1. Of the vegetable constituents employed in the preparation of pills the greatest adsorbing power in relation to strychnine is found in althaea and licorice roots. 2. The adsorbing properties of a dandelion powder are insignificant, they are lower than those of yeast extract. In the preparation of pills with strychnine it is most rational to use dandelion root as the inert constituent. 3. The vegetable constituents employed in the preparation of pills cannot be looked upon as indifferent, because adsorbing the therapeutic substance from the pillular mass they influence the pharmacodynamic effect of the therapeutic agent. 4. Considering the change in conditions of the pharmacological activity of therapeutic substances it is necessary to work out exactly the nature of constituents employed in the preparation of pills, so as to know what vegetable constituents must be used for a given substance. 5. Pills containing alkaloids must not be kept for a long period of time.—T. TSCHERIKOWSKYA *Sovets Pharm* (1935) 1-7 (A S S)

Plants—Ultrafiltration and Its Application to the Extraction of the Active Principles of A description of the preparation of ultra filters. The active principles of belladonna, henbane and strophanthus pass through an acetate collodion filter, of porosity calculated to let pass only crystalloids as Graham understood that term, and can thus be obtained in a very pure state.—L. I. BRACCIO *Boll chim farm*, 74 (1935), 185, through *Chem Abstr*, 29 (1935), 4517

Propylene Glycol—Use of, As a Solvent Experiments were carried out to ascertain the value of propylene glycol as a solvent for pharmaceutical use. From the results of these experiments, it appears that propylene glycol is not as good a solvent as ethylene glycol of defatted cochineal but in the case of cudbear it is superior. Propylene glycol is a solvent of the constituents of aloes which react with ammonia, and of the tannins in catechu. It is suggested that further work should be done to test the non toxic properties accredited to propylene glycol.—J. RAY *Pharm J* 134 (1935) 590 (W B B)

Pyrethrum—Deterioration of The loss of insecticidal activity of pyrethrum is due to

oxidation and is activated by light. It can be partially inhibited by hydroquinone or tannic acid. Some slow loss of potency occurs during storage, the cause of which is unknown. Extracts dissolved in kerosene and other inert solvents are fairly stable. Strong soaps and alkalis may be deleterious because they hydrolyze the esters.—F TATTERSFELD *Chem Trade J*, 96 (1935), 273, through *Squibb Abstr Bull*, 8 (1935) A 937

Raspberry and Strawberry Flavors Raspberry extract may be prepared by pulping the fruit allowing it to ferment with sugar at 25–30° and concentrating by distillation, sugar and acid should be in ratio of 100 : 47. Addition of vanillin or vanilla extract is desirable. Cheaper extracts may be fortified with synthetics such as iso butyl formate, or acetate, iso butyl acetate, iso amyl butyrate and iso butyrate. Other substances used in large proportions are ethyl formate butyrate, iso butyrate, oenanthat, iso amyl acetate and acetaldehyde. Small quantities of clove oil and alpha ionone and traces of ethyl benzoate, neroli oil, terpeneless lemon oil, cinnamon oil, orris oil and methyl salicylate have also been recommended. In the case of strawberries, the fermentation process is omitted and the alcohol recovered by distillation *in vacuo*. It should be fortified by the addition of ethyl methyl phenyl glycidate ("Aldehyde C16"). Traces of methyl salicylate and pimento oil, coumarin with or without vanillin and the following esters may be employed: iso amyl butyrate, and iso butyrate, ethyl formate, acetate, butyrate, iso butyrate, pelargonate, benzoate and cinnamate, iso amyl formate and valerate, benzyl acetate and valerate. Other constituents are benzaldehyde, eugenol, clove oil, cinnamon oil, neroli oil, terpeneless orange oil, orris oil and cognac. The sugar to acid ratio should be 100 : 16.—H STANLEY RED-GROVE *Am Perfumer*, 30 (1935), 193–194, 222 (G W F)

Solution of Adrenaline (1–1000)—Practically Neutral, with Good Keeping Qualities. The following formula is recommended: Adrenaline 1 Gm, *N* hydrochloric acid 5.45 cc, solution of sodium bisulphite (d 1.33) 5 cc, sodium chloride 7 Gm, water enough to make 1000 cc. The amount of hydrochloric acid used is the quantity theoretically required to form the hydrochloride of the adrenaline, and the *pH* of the solution is 3.8.—LOUIS JULIEN *J pharm chim*, 22 (1935), 53–59 (S W G)

Solution of Bismuth and Ammonium Citrate, B P C 1934 It is suggested that 20 cc of distilled water be used in preparing Liquor Bismuthi et Ammonii Citratis B P C for mixing the citric acid and the bismuth subnitrate, instead of 2 cc as stated by the B P C. Also, more detailed instructions regarding the washing of the bismuth citrate should have been given in the B P C regarding this solution.—R D KOTWAL *Pharm J*, 134 (1935), 564 (W B B)

Solutions—Sterilization of, for Injection Many drugs intended for parenteral administration are of a heat labile nature, the heat stability varying with the drug under consideration. The degree of thermostability and the loss in activity of the solutions during periods of storage at ordinary temperatures are closely related problems. All apparatus used in the preparation of Solution of Adrenaline Hydrochloride B P must be sterile, and, together with the ingredients, should be free from alkali, iron and ammonium salts. A routine method for preparing this solution is to dissolve the chlorbutol and sodium chloride in 90% of the finished volume of hot sterile distilled water, stopper the vessel with a sterile rubber bung and allow to cool. Place the adrenaline in a small bottle, displace all the air by an inert gas such as nitrogen and add a few cc of sterile distilled water followed by the hydrochloric acid measured from a sterile pipette. Pour this solution into the solution of chlorbutol and salt, rinse the smaller vessel with several quantities of sterile distilled water, add to the main solution, make up to volume, displace all air from above the solution, stopper and mix well. In regard to solutions of morphine salts, the *pH* value, often a good guide to the extent of decomposition, gives little assistance, a highly decomposed sample having a *pH* showing little variation from a normal solution. It seems, however, that the change is one of oxidation and a more stable solution may be made by preparing it under aseptic conditions, with the total exclusion of atmospheric oxygen. A satisfactory 50% solution of dextrose has been prepared by the routine method of dissolving the requisite amount of dextrose B P in an equal quantity of boiling distilled water contained in alkali-free resistance glass apparatus. The solution so obtained is filtered through a bed of fine kieselguhr on a Buchner funnel and corrected to volume when cold by a further suitable addition of water. It is then ready for sterilization at 10 pounds for half an hour.—H GARTSIDE *Pharm J*, 134 (1935) 507 (W B B)

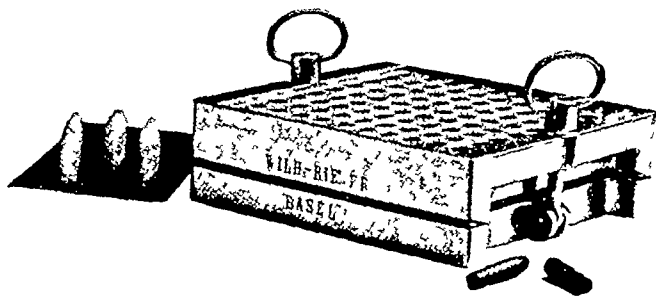
Sterile Solutions—Preparation of Some Detailed directions are given for preparing sterile solutions of the following for intravenous therapy: camphoric acid and salts, camphorcarboxylic

acid and salts, camphorthiocarboxylic acid and salts, ($p\text{-CH}_3\text{C}_6\text{H}_4\text{S}$), naphthoresorcinol trihydri, sodium polythionates, quinine, copper and urotropine salts, tetraglycolyl orthosilicate dyes, diphenyl derivatives, erythritol tetranitrate and nitroglycerin —E CHIERICI *Boll chim farm*, 74 (1935) 145, through *Chem Abstr*, 29 (1935), 4516

Sterilization Notes The article contains a summary of the conclusions from discussions on papers on sterilization. In brief, the conclusions are (1) Ampuls must be previously cleansed and sterilized by hot air at 160° for two hours, (2) distilled water should be used, (3) neutralized and sterilized oil must be used for only liquid injections, (4) greatest of aseptic conditions should be observed, (5) autoclaving at temperatures between 110° and 120° for fifteen to twenty minutes is the perfect method of sterilization, (6) bacteriological control should be maintained over preparations if filters are used, (7) neutral glass should be used for ampuls (8) stocks should be renewed frequently —ANON *Pharm J*, 134 (1935), 384 (W B B)

Sterilization Notes Samples of olive oil and almond oil, submitted to sterilization by heating to temperatures of 150°C to 155°C for one hour, were examined at intervals in order to detect any effects due to heating. Sterilized olive oil showed considerable loss of color and had developed a greenish shade. Almond oil was slightly less colored than an untreated sample. The acid value of the two oils, after treatment, was the same as before treatment. No increase in the acidity was noticeable at weekly intervals for a month. The conclusion is that the treatment causes no subsequent deterioration. R A O'Brien and H J Parish state that the accumulated experience of some years convinces them that heating contaminated oil to 150°C for an hour ensures sterility, whatever the contamination. They also state that "the prescribed method of Tyndallization may fail to sterilize contaminated oils." Novocaine dissolved in 0.001N hydrochloric acid is stable when sterilized in a current of steam, and hydrolysis on autoclaving is not more than 2%. Hydrogen-ion concentration is not affected by sterilization. The pH value of novocaine solutions should not be more than 5. Ampuls for novocaine solutions should be made of Jena glass, since the action of a minute quantity of alkali on an unbuffered solution can alter the pH value and cause strong hydrolysis —ANON *Pharm J* 134 (1935), 647 (W B B)

Suppository Mold—Apparatus, Small Scale, for Pharmaceutical Manufacturing The mold, made of a nickled brass alloy, prepares 100 suppositories and weighs about 6 Kg. The form is divided horizontally into two halves at a point where the suppository has the greatest diameter. The two halves fit together by four guide grooves with springs at the corners, and are tightened by



two wing nuts. The method of assembling and using the mold, as well as the proper preparation of the suppository mass, is described in detail —GÄRTNER and SCHENKER *Schweiz Apoth Ztg* 73 (1935), 357 (M F W D)

Tincture of Ginger, Strong The last British Pharm reinstates Tinct Zingib Fort after its having been omitted from the two intermediate issues. The changes after an interval of nearly fifty years are practically negligible, "moderately coarse powder" replaces "fine powder," directions for the process of percolation have been deleted and metric weights and measures are used —C E DODSLEY *Pharm J*, 134 (1935), 602 (W B B)

Water-Sterilization of, by a New Quartz Lamp An apparatus is described for the sterilization of water and such oils as cod liver, soya bean, rape, etc. —Riechstoff *Ind Kosmetik* 10 (1933) 111 (H M B)

PHARMACOPŒIAS AND FORMULARIES

Pharmaceutical Formularies and the Belgian National Formulary A historical review of the formularies and dispensaries of many countries with special emphasis on the Belgian publications—O VAN SCHOOR *J pharm Belg*, 17 (1935), 383-388, 405-410, 430-434 (S W G)

Pharmacopœial Questions from Practitioners Two preparations of the Swiss Pharm V—Tablets of Ipecac and Opium and Pastilles of Sodium Bicarbonate—are considered The formula of the first differs considerably from that in the fourth edition and should no longer bear the synonym Vigner Tablets The title of the second preparation should be Compound Pastilles of Sodium Bicarbonate—J B L *Schweiz Apoth-Ztg*, 73 (1935), 321 (M F W D)

Pharmacopœias—The Oldest of Switzerland A brief history of some of the outstanding pharmacopœias is given The earliest ones were private enterprises, the first appearing in Basle in 1561 Before this the mention of drugs was made in price lists, the first of these being dated 1404 Pharmacopœias as such are of comparatively recent origin The first Swiss Phar appeared in Latin in 1865, the second in 1872, the third in 1893 and the fourth in 1907 The earliest record of an apothecary shop is found in Basle in 1250—ANON *Schweiz Apoth Ztg*, 73 (1935), 269 (M F W D)

U S P Revision The Committee of Revision of the Pharmacopœia of the United States 1930-1940 has issued the U S P X Interim Revision Announcement No 4, which includes revised or new texts for Magnesia Magma, Oil of Lemon, Non destearinated Cod Liver Oil, Large Poison Tablets of Mercury Bichloride and Small Poison Tablets of Mercury Bichloride The tests become official on October 1, 1935 The revised text omits the manufacturing details for milk of magnesia, but adds more exacting requirements for uniformity and purity than were in the old text, these being capable of enforcement through appropriate tests For purposes of minimizing the action of magnesia magma on glass containers, 0.1% of citric acid may be added The modification of the standards for oil of lemon brings them into conformity with new developments in manufacture and authorizes the official use of a domestic oil of lemon Increasingly large importations of so-called "undestearinated cod liver oil," for subsequent destearination, made desirable appropriate standards and tests of this non destearinated cod liver oil The poison tablets of mercury bichloride must be of a distinctive color (not white) and shall be of an angular or irregular shape (not discoid) When sold in quantities for household use they should be dispensed in glass containers of a distinctive angular shape, having irregular or roughened sides or edges On the exterior of each container must be placed a red printed label bearing the word "Poison" and a statement indicating the amount of corrosive mercuric chloride per tablet—ANON *Pharm J* 134 (1935) 748 (W B B)

NON-OFFICIAL FORMULÆ

Cellulose Varnish A varnish containing, *e g*, benzylcellulose 5-18, benzine 18-40, toluene or xylene 25-45 and butyl acetate 20-35% or benzylcellulose 2-12, benzine 50-80 and ether 25-80% used for pharmaceutical or toilet purposes, is contained in a collapsible tube and used as required—J WALD and G LEGRAND *French Pat*, 777 999 (Mar 6, 1935), through *Chem Abstr* 29 (1935), 4526

Cleansing Cream Containing Magnesium Hydroxide A cleansing cream which is solid at room temperature contains beeswax 1-6, petrolatum 30-60, mineral oil 30-60, free magnesium hydroxide 0.5-6.0 and water 10-30% U S Pat 1 999,161 relates to a skin cream comprising petrolatum, a cholesterol alcohol, ceresin wax, magnesium hydroxide and water—BRUCE WALTON (to Chas H Philips Chemical Co) U S Pat 1 999,160 (April 23), through *Chem Abstr*, 29 (1935), 4136

Cosmetic Pomade A pomade contains paraffin 40, camphorated oil 24, camphorated alcohol 130, sulphur extract 1 Gm and tincture of iodine 40 drops—F BALZARELLI and C BALDINI *French Pat*, 778,236 (Mar 12 1935), through *Chem Abstr*, 29 (1935), 4526

Cosmetics—Progress in, in 1934 A discussion of the progress made in 1934 in producing new shaving, hair and skin creams, face lotions and packs, sunburn and suntan preparations, depilatories eye and lip cosmetics bath, tooth and mouth products is offered—KARL PFAFF *Reichstoff Ind Kosmetik* 10 (1935), 88-92 (H M B)

Dentifrices Oils, fats or waxes are used as means for giving to the preparations the desired consistency Examples contain (1) liquid paraffin 200, gum tragacanth 20, soap 30, sodium

perborate 30, saccharin 0.5, essential oils 2 and calcium carbonate 250 Gm, and (2) olive oil 200, potassium acid phosphate 20, gum tragacanth 20, saponite 20, saccharin 0.5, essential oils 2 and calcium carbonate 250 Gm—G BEHR French Pat, 778,232 (Mar 12, 1935), through *Chem Abstr*, 29 (1935), 4525

Derris Root—Uses of Derris is effective against the following parasites many caterpillars, probably all larvæ of leaf-eating wasps, many beetles and their larvæ, turnip fleas, flower wasps, plant lice and red spiders. It is of no value against wasps, adult flies and moths, certain kinds of caterpillars, many beetles and scale insects. The powdered root, mixed with 40 parts of talc, makes a very good insect powder for dogs and cats—*Ber Afđ Handelsmuseum Kon Ver Kol Inst* (1934), 90, through *Quart J Pharm Pharmacol*, 8 (1935), 300 (S W G)

Face Powders—Trends in A sample of face powder taken from an early Roman tomb analyzed by the British Museum was found to be much like modern powders and to contain talc, lead carbonate, chalk and clay. In the intervening period little has been done but to eliminate the poisonous ingredients and to better balance the properties. Recent discoveries take two forms (1) face powder bases and (2) the substitutes. The former are really ingredients intended to improve slip and because of their adhesiveness to supplant stearates, others are intended to provide better covering power and adhesiveness, the slip being provided by talc. The substitutes are intended to provide all of the necessary properties of a face powder, i. e., covering power to a correct degree, slip, adhesiveness and sufficient absorbing power to hold perfume and color. The outstanding property to be concerned with is covering or hiding power. There is a real demand for a powder which does not become translucent and some new bases have been developed to utilize the principle of diffusion of light through the use of uniform infinitely fine (10 microns or less) particles of a particular shape rather than depend upon the reflection of light from varying percentages of opaque pigments—F CHILSON *Drug and Cosmetic Ind*, 36 (1935) 685-686

(H M B)

Grease Paints Grease paints are made up of two main constituents, namely, a dry base and a fat base. The dry base is selected from raw materials such as zinc oxide, kaolin, precipitated chalk. The more expensive dry bases are titanium oxide and subnitrate of bismuth which are used in high class grease paints. The fats used for the fat base have to be so selected that the product will only melt at a temperature higher than that of the blood. The fat base should be made up of selected material such as hard paraffin, soft paraffin, liquid paraffin, beeswax, lanolin and oils such as kernel and almond oil. The adhesion of the grease paint to the skin of the face is one of its main features. The perfume is added to the fat base, and the coloring matter to the dry base. Thorough incorporation of the one base with the other is absolutely essential, and any failure in this respect would ruin the entire composition—A G AREND *Perf Ess Oil Rec*, 26 (1935), 254

(A C DeD)

Hair Dyes—Manufacture of A discussion of the manufacture of hair dyes including the system of preparation and the examining of the dyed hair is given—A G AREND *Perf Ess Oil Rec*, 26 (1935), 211

(A C DeD)

Hair Lotion The lotion contains alcohol 420, camphor 15, ammonia 22, turpentine oil 40 and camomilla decoction 415 Gm—HENRI FAGNY French Pat, 776,966 (Feb 8, 1935)

(T G W)

Hormonöl Supra (Chemische Laboratorium Dr Kurt Richter, Berlin) is the pure oil of *Chelonian Aithæa* Sp *Spharigda* (giant turtle oil?) from Mexico. The oil penetrates the epidermis of the human skin extending through the corium to the subcutaneous tissues. It represents the most natural and strongest astringent known being completely absorbed by the human skin. It closes large pores and removes wrinkles. Since the oil is drying it may be used as such for oily skins, for dry skins, however, it should be used with about 10% vegetable oil (almond oil). The following formula for a skin cream is offered: Hormonöl Supra 20%, white American petrolatum 15%, lanolin 10%, Hydrocerin 10%, spermaceti 5%, water 45%. To obtain the maximum astringent action a cream should contain at least 20% of the oil. In preparing the cream do not stir any more than is necessary for emulsification, no more air than is necessary should be introduced. Since the oil begins to decompose at 35° C it should not be heated over a direct flame and in a cream the oil should be added when the mass has cooled to this temperature. The value of the oil depends upon its high vitamin content and the presence of certain hormones which have a specific action on slackened cellular tissue. It may be substituted in part for oils used in fatty or

night creams and also enter the composition of nourishing, wrinkle and other creams—*Riechstoff-Ind Kosmetik*, 10 (1935), 111–112 (H M B)

Lanolin and Its Uses The following formulas are suggested *adepts lanæ cum aqua* adeps lanæ 75%, distilled water 25%, *pharmaceutical lanolin ointment* adeps lanæ anhydr 65, distilled water 20, mineral oil 15, *lanolin cream* petrolatum 100 Gm, lanolin anhydrous 300 Gm, water 600 Gm, *lanolin cold cream* fatty almond oil 4200 Gm, white beeswax 600 Gm, spermaceti 600 Gm, lanolin 1800 Gm, stearin alcohol 200 Gm (may be omitted), water 2800 Gm, borax 50 Gm, *boroglycerin lanolin prescription* A Dissolve 10 Gm boric acid with heat in 40 Gm glycerin and add 200 Gm water B Paraffin 200 Gm, liquid paraffin 500 Gm, anhydrous lanolin 50 Gm, stearin alcohol 20 Gm, cholesterol 10 Gm Fuse one with another until solution results In perfuming lanolin creams too delicate odors do not permeate while stout strong odors are too rough The following are suggested chypre, violet, honeysuckle, benzyl acetate, certain hyacinth compounds and aldehydes Lanolin powders may be prepared by dissolving lanolin in acetone and incorporating with the powder, or by fusing lanolin 10, stearin alcohol 1 and mineral oil 5, slowly adding 20 Gm water containing 1 Gm potassium stearate, cooling, adding 50 Gm of water to form an emulsion Add this to 300 Gm powder, dry, pulverize and sift In superfatting soaps 5% of lanolin is easily absorbed by soaps It causes reduction in lathering power which may be corrected by addition of coconut oil, triethanolamine (2–5%) or stearin alcohol (2–5%) Lanolin promotes water in oil emulsions—JOSEF AUGUSTIN *Am Perfumer*, 30 (1925), 187, 188, 192 (G W F)

Mouth Wash Powders The powders comprise a stabilized oxygen-yielding compound mixed with a silver containing compound and preferably also with an acid substance The oxygen yielding compound, e g, urea-hydrogen dioxide, alkali peroxide-pyrophosphate, alkali perborate or percarbonate, is preferably free from water of crystallization and is stabilized in known manner e g, with magnesium silicate The silver compound may be an inorganic salt, e g, silver nitrate, silver sulphate or the silver chloride ammonium compound or an organic salt, e g, silver acetate, or the benzoate, salicylate, or *p* hydroxy benzoate Citric, tartaric, boric or phosphoric acid, etc, or acid compounds, e g, acid phosphates are used preferably in such proportion as to neutralize only 40 to 60% of the alkalinity of the oxygen yielding compound Flavorings and perfumes may be added In an example, dehydrated sodium borate 30 is mixed with the silver salt of *p*-hydroxy benzoic acid 16 and tartaric acid 11.25 Gm—*Deutsche Gold- und Silber-Scheideanstalt vorm Roessler* Brit Pat, 421,692 (Dec 28, 1934), through *Chem Abstr*, 29 (1935), 3785

DISPENSING

Apomorphine Hydrochloride—Preparation of, for Injection The Spanish Phar method gives the most stable solutions Although present methods do not yield solutions which are permanently colorless, there is no loss of activity associated with the appearance of the green color—D PONTE *Giorn farm chim*, 84 (1935), 53, through *Chem Abstr*, 29 (1935), 4517

Arsenical Fowler Solution The author discusses the changes in formulas for Fowler Solution involved in the third and fourth editions of the Belg Phar In the B P III the formula was Arsenic trioxide 1 part, Potassium carbonate 1 part, Water 2 parts This was changed in the B P IV to, Arsenic trioxide 1 part, Potassium bicarbonate 1 part, Water 2 parts The chemical reactions involved in the preparation of Fowler Solution are discussed with several references to the literature—G VERSCHURE *Pharm Tijdschr Nederland-Indie* 13 (1935), 41 (E H W)

Bakelite Containers In order to utilize bakelite ointment jars, it is not sufficient to see that they are not attacked Attention should be given to the ointment itself which may undergo alterations, especially modifications of coloration This is noticeable in phenolic preparations It is necessary to direct the attention of the manufacturers of bakelite to these facts—BUCCHE and SCHENKE *J suisse pharm* No 20 (1935) 242, through *J pharm Belg*, 17 (1935), 511 (S W G)

Calcium Gluconate for Injection Various methods of manufacturing calcium gluconate are mentioned The method of preparing solutions for injection as used by the firm of Merck Darmstadt, is as follows calcium gluconate, pure, for injection "Merck" is dissolved in the proper amount of water by warming and then heated under a reflux condenser for two to three hours The warm filtered solution is then run into carefully rinsed and sterilized ampuls being sure that

none of the liquid remains in the neck of the ampul. The ampuls are then sterilized for one hour at 100° on at least three successive days.—C. A. ROTHENHEIM *Pharm. Acta Helv.*, 10 (1935), 114 (M F W D)

Capsules—Accuracy and Speed Factors in Methods employed in determining contents of capsules are (1) dissolving contents of capsule and subsequent evaporation of solvent, (2) assay of ingredients, (3) emptying contents and weighing, (4) using empty capsule as counterpoise, (5) weighing a number of filled capsules at the same time using an equal number of empty shells as a counterpoise, changing empty shells for others after one or two operations. Objections are enumerated. One manufacturer said that the weight of empty shells of the same lot rarely varied more than 3% of the average weight. Empty shells made by different manufacturers may show a difference in wall thickness and hence in weight. One said that a 10% error would be the maximum. A table shows results obtained by weighing different batches taken at random from stock. Another table shows two methods. Two prescriptions of 12 capsules each were used. With one each capsule was weighed on an analytical balance and the average weight of the same size empty capsule subtracted, with the other the contents of the capsule were emptied on a tared watch glass and then weighed on an analytical balance. In both instances results were near theoretical. Of the three general methods for filling capsules, weighing each capsule is most accurate but is impractical for ordinary dispensing. The other two, "the punching method" and "the blocking method" are considered. Factors to be taken into consideration in any comparison are quantity of material per capsule, nature of material, use of the same prescription. Five prescriptions were filled, each by the two methods by the same operator. Tables show the results obtained. A 10% variance was arbitrarily selected, either plus or minus, from the theoretical average weight. The tables show a striking uniformity in the degree of accuracy obtained by average operators working under ordinary conditions by either punching or blocking methods. The punching method required about one-third less time. Of the 100 prescriptions filled only nine were within the 10% limit of variance, five of them filled by punching, four by blocking. The author concludes that comparative accuracy between blocking and punching is in direct ratio to the skill of the operator. Less time is required in punching than in blocking and with a comparable degree of accuracy. Results of the study indicate that a tolerance of more than 10% should be established. Average weight of an empty capsule obtained by the method described may be used as a tare in determining weight of filled capsules.—JOHN W. LEE *J. Am. Pharm. Assoc.*, 24 (1935), 469 (Z M C)

Chloral Hydrate Suppositories—Preparation of For preparing suppositories containing from 0.1 to 1.0 Gm. chloral hydrate in each, the author suggests the following: the powdered chloral hydrate is mixed in a mortar with one third of the "Astrafat"; the other two thirds of the mass melted and added; the whole mixed, and when of proper consistence poured into chilled molds. A series of suppositories containing up to 1.0 Gm. of chloral hydrate in each was prepared and the solidification and melting points tabulated. After two days the suppositories showed no crystals of chloral hydrate under the microscope. An investigation of chloral suppositories made with hydrogenated peanut oil of the Swiss Pharm. V. showed them to be too soft and not easily removed from the mold.—H. LEHMANN *Schweiz. Apoth.-Ztg.* 73 (1935), 297 (M F W D)

Error in Dispensing—Margin of Determination of the Reasonable or Permissible **Liquids** Though liquid prescriptions are usually measured, possibilities for error are greater than commonly held. Most of them are too small to be of practical significance. The three considered in this study in the order of importance are (1) the nature of the liquid to be measured, (2) shape and size of graduate used, (3) the personal equation. The first test aimed to determine relationship between size and shape of graduate and magnitude of error. The second test aimed to determine how magnitude of error was affected by physical properties such as color, viscosity. Liquids were measured in both cylindrical and conical graduates by 100 senior students. The liquid was poured from a quart bottle into the graduate, then to prescription bottle, then to a tared container and accurately weighed. Quantities were 10 cc., 25 cc., 50 cc. and 100 cc. The magnitude of error is greater with conical graduates. The larger the graduates and the larger the volume the smaller the percentage of error. Error due to personal equation is indefinite and impractical to measure. It is revealed by a definite trend in a series of measurements by an individual. It might be due to defective vision, to natural carelessness or to some other trait. In the second series of tests concerned with physical properties the magnitude of error was in the following order: Distilled Water, Elixir of Iron, Quinine and Strychnine (color), Syrup (viscous clear)

Milk of Magnesia (opaque), Castor Oil (oily) Color has a tendency to increase error and so does viscosity The large error for Castor Oil, 4.49%, is doubtless due to the fact that the refractive index is so near that of glass that adherence of the oil is not detected and insufficient time is allowed for drainage The large error with Milk of Magnesia is due to the impossibility of draining Results of the 100 workers are summarized in a table and another table shows per cent deviation from average weight 'From the data obtained it appears that twice the standard deviation is a reasonable margin of error for the measurement of the volume of liquids' This would permit acceptance of the following

Shape of Graduate	10 Cc	25 Cc	50 Cc	100 Cc.	Elixir I Q & S 100 Cc	Syrup 100 Cc	Milk of Magnesia 100 Cc	Castor Oil 100 Cc
Cyl	97%	94%	96%	95%	93%	94%	93%	93%
Con	95%	98%	95%	95%	95%	96%	95%	94%

MARVIN J ANDREWS *J Am Pharm Assoc*, 24 (1935), 477

(Z M C)

Histamine Injection The preparation containing histamine acid phosphate 1 mg, isotonic salt solution 1 cc and phenol 0.005, is used as an antirheumatic The recommended dosage is two to three subcutaneous injections a week for four weeks—*Bull Ch Synd Pharm Seine* (Feb 1935), through *J pharm Belg*, 17 (1935), 404

(S W G)

Hospital Dispensary Methods A brief survey of hospital dispensary conditions, more specifically pertaining to the average time taken per patient at the dispensary stage—*Pharm J*, 134 (1935), 353

(W B B)

Mercury Pill B P 1932—Note on The undernoted modification is suggested for the official formula for Mercury Pill

B P		Modification	
Mercury	33 Gm	Mercury	33 Gm
Syrup	14 Gm	Syrup	12 Gm
Liquid glucose	15 Gm	Liquid glucose	12 Gm
Glycerin	5 Gm	Glycerin	1 Gm
Licorice	33 Gm	Licorice	40 Gm
		Tragacanth	2 Gm

The tragacanth should be mixed with the second portion of the licorice and incorporated in the mass The quantity of glycerin has been reduced because there is enough hygroscopic material even without any glycerin at all—*P BOA Pharm J*, 134 (1935), 356

(W B B)

Methylene Blue Injection The following formula of De Raymond is given Methylene blue 10 Gm, sodium thiosulphate 50 Gm, saccharose 97 Gm distilled water enough to make 1000 cc Put up in 2- 5- and 10 cc ampuls for intravenous injections—*Bull Ch Synd Pharm Seine* (Feb 1935), through *J pharm Belg*, 17 (1935), 404

(S W G)

Pill Masses A brief survey is given of the various pill excipients prescribed by the British, Belgian Dutch French, Italian, Yugoslavian, German and Swiss Pharmacopœias The author claims to have satisfactorily prepared a large number of pills using as the liquid excipient a mixture of anhydrous glycerin and glucose The author includes a compilation of the formulæ of the above pharmacopœias for Bland's pills—*C A ROTHENHEIM Schweiz Apoth-Ztg*, 73 (1935) 285

(M F W D)

Vehicles—Compositions for Use as, for Other Substances A silica gel suitable as a vehicle for other substances, e g in therapeutic or cosmetic preparations, is obtained by introducing SiF_4 into an aqueous solution of H_2SiF_6 of Sp Gr at least 1.14, separating the gel formed and washing the gel with water until it ceases to have a H_2SiF_6 reaction The gel contains hydrofluoric acid in adsorptive combination and has disinfectant properties A high hydrofluoric acid content is obtained by using H_2SiF_6 of high concentration and operating at a high temperature Temperatures of 0–50° may be used Water or steam may be added during the reaction to keep the H_2SiF_6 concentration constant—*J BLOCH and E BLOCH Brit Pat*, 424,015 (Feb 13, 1935), through *Chem Abstr*, 29 (1935) 4524

PHARMACEUTICAL HISTORY

Apothecaries of the Hague This historical review cites the mention of certain early apothecaries of the Hague in the records of the city Among them are Pieter Willems de Vries 1561

Gregorius van Moersele 1562 and Gregorius de Apothecker 1563 The establishment of an apothecary in the time of Albrecht van Beyeren Colaert van Burustre (or Barastre) in 1397 is also mentioned—A J VAN HUFFEL *Pharm Weekblad*, 72 (1935), 751 (E H W)

Cosmetics in Recent Times—History of The second of a series of articles ALBERT HAUENSTEIN *Riechstoff Ind Kosmetik*, 10 (1935), 95-96 (H M B)

Homeopathy—History of An address reviewing the history of homeopathy—J KATZ *Pharm Zentralh*, 76 (1935) 269, 286 (E V S)

Pharmacy at the Beginning of the 19th Century This article, one of a series on historical pharmacy, describes Dutch pharmacy at the beginning of the nineteenth century Rather of interest is the fact that in 1812 the population of Amsterdam was nearly 200 000 and the number of pharmacists 150 To day the population is four times as large but the number of pharmacists remains nearly the same—A J VAN HUFFEL *Pharm Weekblad*, 72 (1935), 822 (E H W)

United States Patents Granted for Medicines during the Pioneer Years of the Patent Office 'Patent' means open, not secret A patent cannot be granted for a medicine of secret composition and the term "Patent Medicine," applied to medicine of secret composition is a misnomer Patenting a medicine does not preclude telling fairy tales about it, therapeutic claims in the description of some of the patents for medicines are false and fraudulent In this paper some interesting phases in the patenting of medicines are related and the history from its beginning in England is discussed, a number of well-known remedies being mentioned Our Constitution gives the power to "Promote the progress of Science and useful arts by securing, for a limited time to authors and inventors the exclusive right to their respective writings and discoveries" The first law under this provision was enacted in 1790 and provided for a board consisting of the Secretaries of State and War the Attorney-General and the President Thomas Jefferson, Henry Knox and Edmund Randolph made the first board The first patent was issued to Samuel Hopkins to cover a process for manufacturing "Pot and Pearlash" No grant for any medicine was issued under this law A new law was issued in 1893 The first patent dealing with therapeutic matters was issued in 1796 to a physician for a device for removing pain the acme of fraud In 1836, a fire destroyed records patents drawings and designs but Congress had published Indexes which were filed elsewhere and titles of the patents were preserved in this way In 1836, a new law was passed and numbering of patents was begun Between 1790 and 1836 about 75 patents covering pills medicines, ointments and salves were issued These are listed with name of medicine, date and patentee The John Cullen process patent for "Liquid Magnesia" in 1818 was probably the first for a medicine, the product resembles our present solution of magnesium citrate, and even then magnesium compounds were recognized as having aperient properties A photostatic copy of a 'Diaphoretic or Sweating Powder' patent is given and also a summary of other Howard Patents Bitter Tonic, Tincture of Myrrh Compound Antispasmodic tincture, Astringent tincture Others mentioned are Chlorine Cosmetic in 1833, Ointment for Curing Many External Diseases, 1835, Ointment for Cure of Cancer in 1836 Thomson's Improved System of Botanic Practice of Medicine, in 1836 Photostatic copy of a page of the latter is given—LYMAN F KEBLER *J Am Pharm Assoc* 24 (1935) 485 (Z M C)

PHARMACEUTICAL LEGISLATION

Food and Drug Legislation—National The text of a radio address Reference is made to the first step in food and drug legislation in 1850, the passage of the present law in 1906 and the growing recognition of need for its revision S5 popularly called the Copeland Bill contains valuable features of the present law It eliminates provisions that have caused courts to make interpretations that afford avenues of escape for unscrupulous, it extends provisions to cosmetics and advertising it amplifies and reinforces some provisions that safeguard public health it strengthens procedural provisions The Bill contains definitions of foods, drugs and cosmetics The definition of standards are broad If it becomes law the motive of fear upon which much advertising is based should be disposed of because statements of fact are required If there is not sufficient consumer interest it is in danger of not becoming a law—RALPH W CLARK *J Am Pharm Assoc* 24 (1935) 490 (Z M C)

Laws and Orders Regarding Pharmacy in 1934 A review of laws and orders which include general matters sickness compensation management of pharmacies legislature pharmaceutical concessions improvements help the commerce of new remedies spirits serums narcotics, and

statements introducing new remedies, patented medicines, etc.—WALTER SCHMIDT *Pharm Zentrallh*, 76 (1935), 240, 253 (E V S)

PHARMACOLOGY, TOXICOLOGY AND THERAPEUTICS

PHARMACOLOGY

Carotene and Vitamin A—Absorption of A study has been made of the absorption of vitamin A and carotene administered to a patient suffering from a condition which led to part of the contents of the thoracic duct being diverted into the pleural cavities. Analysis of the fluid removed at intervals from the chest cavities enabled approximate estimations to be made of the amount of vitamin A and carotene absorbed by the way of the chyle. It was found that a relatively small proportion of the carotene administered orally could be accounted for by the pigment found in the chylous fluid, whereas in the case of vitamin A, the amount recovered was such as to indicate an almost complete absorption. The vitamin, administered as the free alcohol, was found present in the lymph mainly in the esterified condition, and it is thought probable that the linkage with the fatty acids during passage through the intestinal walls accounts for the much higher coefficient of absorption as compared with that found when carotene was given. Observations on the chylous fluid show that over a range of reaction, much wider than that encountered in body fluids, no trace either of carotene or of vitamin A passed a dialyzing membrane. Both compounds appeared to be present in colloidal form and closely associated with the highly dispersed fat.—J C DRUMMOND, M E BELL and E T PALMER *Brit Med J*, 1 (1935), 1208 (W H H)

Castor Oil—Purgative Action of, and Alimentary Disequilibrium Experimental evidence is presented showing that the purgative action of castor oil is due to an alimentary disequilibrium. If the castor oil be introduced into a diet properly balanced, no nutritive disturbances or laxative actions become manifest, the oil is assimilated by the animal. The authors deduce that the truly active principle and very probable cause of purgation is the ricinoleide. The pigeon was used as the test animal.—R LECOQ and J SAVARE *Bull sci pharmacol*, 42 (1935), 161 (C T I)

Chemical Constitution and Taste—Relations between In previous studies of the variations in taste attention was directed principally to modifications of the carbonyl and imide groups. The research reported in this paper followed the observation that the better known synthetic sweet compounds, such as saccharin and dulcin, are derivatives of ammonia in which one or more hydrogen atoms are substituted by negative radicals. The author studied the products derived from ammonia by substitution of an acyl radical for a hydrogen, *i e*, the acetyl radical and halogenated acyl radicals. The following compounds were prepared from aqueous or alcoholic ammonia and the ester acetamide, monobromoacetamide, monochloroacetamide, dibromoacetamide, dichloroacetamide, tribromoacetamide, trichloroacetamide, moniodoacetamide. With the chlorides and the bromides the taste became more sweet with increase in number of halogen atoms introduced into the acyl radical, or as the radical becomes more negative. The *pH* values for 1% solutions of the dihalogen substituted compounds are higher than for the mono or trihalogenated compounds. The *pH* values are lower for those compounds of bitter or pungent taste.—ANTONIO GIACOLONE *Gaz Chim Ital*, 65 (1935), 129–131 (ANNE E WHITE)

Cocaine Salts—Study of the Activity of Different A series of solutions of salts of cocaine containing in 10 cc the same quantity (0.892 Gm) of cocaine base or 1 Gm of cocaine-HCl was prepared and the reactions were regulated by means of the corresponding acids to *pH* 4. The solutions were assayed on the rabbit's cornea according to J Régnier (*Bull sci pharmacol*, 30 (1923), 580–646). The following values represent the percentage concentrations of cocaine-HCl which are the anesthetic equivalents of the solutions studied: Citrate 0.2, lactate 0.4, tartrate 0.6, sulphate 0.8, phosphate 1.0, hydrochloride 1.0, hydriodide 1.2, sulphocyanate 1.5, formate 2.5, acetate 2.9, salicylate 4, benzoate 5, phenylacetate 12. These results do not follow the theory that only the liberated base is responsible for anesthetic action. The following conclusions are drawn: 1. The activities of the salts do not arrange themselves according to the degree of hydrolysis. 2. Certain acids (particularly citric) exhibit actions entirely unfavorable to the utilization of the alkaloid, the solution of cocaine citrate being almost totally unabsorbed by the rabbit cornea. 3. The solubility in cellular lipids is not the only factor as claimed by the Meyer and Overton theory, since the salts arrange themselves according to an order determined by Hofmeister on albuminoid substances.—J RÉGNIER and R DAVID *J pharm chim*, 22 (1935), 16–22 (S W G)

Coffee and Decaffeinated Coffee—Effect of, upon Tremor in Normal Men and Women

Seven young men and an equal number of women received coffee on one day of each week for several weeks and decaffeinated coffee or no special beverages on the intervening days. With the hand in a static position and the forearm supported to the wrist, the vertical movements of the index finger were magnified by an optical lever and recorded photographically. The rate of the tremor remained approximately constant throughout the experimental period even when the different beverages were administered. The amplitude of the tremor was increased for several hours after a single dose of coffee, but was not changed by decaffeinated coffee. In the women coffee containing caffeine equivalent to 2 mg per Kg of body weight produced an increase in the amplitude of the tremor but in the majority of the men the effective dose was double this size—KATHRYN HORST and J R WILLSON *J Pharmacol*, 54 (1935), 147 (H B H)

Corydaline Hydrochloride—Action of, on the Isolated Small Intestine. Corydaline is the alkaloid from *Viola Bulbosa* (*Corydalis cava*) and corresponds to the formula $C_{22}H_{27}O_4N$. It suppresses the peristalsis of the small intestine—PEDRO N SIVORI *Rev Centro Estud Farm Bioquim*, 25 (1935) 209 (A E M)

Curare and Its Constituents—Pharmacology and Therapeutics of. A full historical and geographical survey of what is known about curare. The author found one sample of curare which had what he termed a "lissive" action that is, the power to remove pathological rigidities without interfering with voluntary movement, thus he was able to relieve tetany in dogs after removing the parathyroids and to relieve chronic spastic disease in man. He has examined many specimens of different varieties of Strychnos in further search for the lissive action. The lissive action is not shown by the crystalline curarine chloride prepared by King—R WEST *Proc Roy Soc Med* 28 (1935) 565 through *Quart J Pharm Pharmacol*, 8 (1935), 305 (S W G)

Acetanilid—Ratio of Toxicity of, to Its Antipyretic Activity in Rats. In rats febrile by yeast injections a dose of 12.5 mg per Kg of acetanilid produces an average fall in temperature of 0.6°C , while smaller doses are without significant effect and larger doses produced greater effects. Twelve and one-half mg per Kg has been taken to be the minimal therapeutic dose for rats. In normal animals, 50 mg per Kg of acetanilid produces a significant decrease in temperature, similar to the fall produced in febrile animals by 12.5 mg per Kg. The lowering of the temperature of the normal animal may be considered an early undesirable effect. The dose fatal to 50% of the rats is 800 mg per Kg. A therapeutic ratio of 64:1 for the antipyretic effect of acetanilid in rats has been obtained—PAUL K SMITH and W E HAMBOURGER *J Pharmacol* 54 (1935) 346 (H B H)

Adhesive Plaster—Irritants in. Patch tests with 8 varieties of adhesive plaster manufactured by six companies were made on 120 subjects, the patches left on for 48 hours and the reactions read. Fifty patients showed a reaction to one or more of the adhesives with the least number of reactions for one adhesive 16% and the greatest number 25%. In addition there were 13 late reactions. Six out of the group which showed marked reactions at the first removal of the adhesive tape with continued intensification at the second inspection, were tested with South American Para rubber (I), starch (II), lanolin (III), orris root (IV), iodine rosin (V), olibanum (VI), gutta serena (VII), beeswax (VIII), Burgundy pitch (IX), zinc oxide (X) and wood rosin (XI). In this group there was sensitization to at least two of the ingredients of adhesive plaster. Six were sensitive to IX, 5 to I, 3 to XI, 2 to VI, 2 to VIII, and one each to III, IV and VII. In the group showing only a slight erythema at the first inspection but who developed delayed reactions tests were made on 12 persons. At the first inspection there were two reactions to V and 3 reactions to XI. Three patients who showed nothing more than erythema at the site of the patch were patched with the 11 ingredients but no positive reactions were obtained and none of the reactions lasted 72 hours. The authors conclude that skin reactions are due to traumatic phenomena or to hypersensitivity to one or more of the ingredients of the plaster. They suggest that non irritating types of resins and rubber should be substituted for the present types used—L SCHWARTZ and S M PECK *Pub Health Repts* 50 (1935), 811, through *Squibb Abstr Bull* 8 (1935), A 915

Alcoholism—Experimental Studies in. IV Attempts to Modify the Concentration of Alcohol in the Blood after Intravenous Administration of Alcohol. The influence of various substances and procedures (diathermy, epinephrine, insulin, caffeine, carbon dioxide, oxygen, olive oil, physiological salt solution and magnesium sulphate) upon the concentration of alcohol in the human blood stream after intravenous administration of alcohol was tested. The maintenance of an elevated body temperature by diathermy apparently caused an increased rate of disappearance

of alcohol from the blood, none of the other procedures tried had any effect that could be considered significant—ROBERT FLEMING and DOROTHY REYNOLDS *J Pharmacol*, 54 (1935), 236

(H B H)

Alkaloids—Distribution of, in Different Parts of Central Nervous System and their Quantitative Microdetermination in Tissues II Quinine and Mescaline Quinine (I) appeared and disappeared more rapidly in the portions of the nervous system rich in cells. The concentration of I in the blood was at first a little more and then somewhat less than in the brain, the concentration in the liver and kidneys was much the highest. I was extracted from the tissues and determined by the fluorescence in sulphuric acid solution. Mescaline (II) determined by sublimation, showed a similar distribution to I although a greater concentration of II in the spinal fluid was observed. Dogs and monkeys were used in the experiment—M VOGT *Arch expil Path Pharmacol*, 178 (1935), 560, through *Squibb Abstr Bull*, 8 (1935), A 969

Alkaloids—Distribution of, in Different Parts of Central Nervous System and Their Quantitative Microdetermination in Tissues I Scopolamine and Atropine A study of the distribution of scopolamine and atropine in various parts of the central nervous system, at various intervals following the administration to dogs and cats and in the presence of ether and morphine. The greatest amount of alkaloid was found in the portions rich in cells, particularly the cerebral cortex and the lowest amounts in the nerve fibers and spinal fluid. The liver and particularly the kidney contained more alkaloid than the cortex. The blood contained approximately the same amount of alkaloid as the brain. The alkaloids were determined by their mydriatic effect in mice. Data are given for the absorption on animal charcoal of the hydrochlorides of apomorphine, bulbo-capnine, quinine, strychnine, atropine, scopolamine and mescaline, from M/100 and M/1000 solutions thereof—F VEIR and M VOGT *Arch expil Path Pharmacol*, 178 (1935), 534, through *Squibb Abstr Bull*, 8 (1935), A 969

Allium—Contribution to the Determination of Preparations of Daily oral administration of 0.5 cc of garlic juice decreased or prevented calcification (sclerosis) and prolonged life from 12.9 to 30–50 days in mice fed high protein diets and 0.2–0.3 cc per day of irradiated ergosterol (Vigantol). Similar results were obtained with *Allium ursinum* L. (I). This property of the allium preparations may be used for their bioassay. The allium preparations had no oral toxicity. The press juice of fresh I had such low toxicity by intravenous injection that it was practically not detectable in the mouse—U HINTZELMANN *Arch expil Path Pharmacol*, 178 (1935), 480, through *Squibb Abstr Bull*, 8 (1935), A 948

Ascorbic Acid (Vitamin C)—Comparison of Oral and Subcutaneous Administration of Protective Doses of The minimal protective dose by mouth is twice as large as that by subcutaneous injection—H C HOU *Proc Soc Expil Biol and Med*, 32 (1935), 1391 (A E M)

Bismuth-Lecibis—An Injectable Preparation of Lecibis a lecithin containing only solution of bismuth tri-camphocarbonate has been investigated. Dogs and guinea pigs have been used in this work and results show it to be relatively rapidly absorbed. After one intramuscular injection in a dog, the elimination begins quickly and continues for weeks—GEORGE KINGISEPP and JUTA OLESK *Deut Med Wochschr*, 61 (1935), 997–1000 (H R)

Blood Alcohol Its Relation to Intoxication in Man In general, intoxication is not noticeable in the human until the blood alcohol concentration is greater than 0.2%, from 0.31 to 0.4% there is a marked intoxication, alcoholic stupor is definite between 0.41 and 0.5%, above 0.5% coma and death may result—R G TURNER *Proc Soc Expil Biol Med*, 32 (1935), 1548

(A E M)

Bone Phosphatase—Activity of, in Chronic Fluorine Poisoning The effect of chronic fluorine poisoning upon bone phosphatase was studied by comparing the phosphatase activity of control rats at various ages prior to weaning with that of rats of the same age whose only source of fluorine was the milk of the mother rat on a diet containing fluorine. The number of rats in each litter was the same. The rats used for comparison were killed at the same age, and an extract of bone phosphatase from the hind legs prepared under identical conditions. Bone phosphatase activity for the control rats showed an increase with age from the time of birth to the age of thirty days, whereas that of the poisoned group showed a decrease from the time of birth, reaching a minimum at about fifteen days of age and returning to the normal for the control rats at thirty days of age. This decrease in bone phosphatase activity harmonizes with the obvious retardation of calci-

fication in the bones of young fluorine poisoned rats —JOHN O THOMAS, R H WILSON and FLOYD DE EDS *J Pharmacol*, 54 (1935), 160 (H B H)

Bulbocapnine—Ratio between Effective and Lethal Doses of, in the Cat. The minimal effective and minimal lethal doses of bulbocapnine vary markedly in the cat, in this series the former ranged from 2 to more than 4 mg per Kg, the latter from 70 (and less) to 130 mg per Kg. Body weight does not appear to be a factor responsible for this variation. The ratio between M E D and M L D ranged from an estimated low of 1.15 to 1.57 in this series. While most animals under lethal and sub lethal dosage showed strychnine-like convulsions predominately several manifested these effects only transiently, and one not at all —R S AMADON and A H CRAIGE *J Pharmacol*, 54 (1935), 334 (H B H)

Digitalis—Relationship of Potency of, as Determined by Different Methods. Among the group of samples of digitalis leaf, two (D and F) were found to be equally effective by the usual Hatcher-method of slow intravenous infusion into the mammal (cat and dog). To cause the same mortality in groups of frogs after injection into the lymph-sac, however there was required 45% more of leaf F than of leaf D, in the frog therefore leaf F was significantly weaker than leaf D. On the other hand, by clinical assay and by determinations of toxicity in experimental cumulative poisoning (dog), tinctures of leaf F were if anything, slightly more potent than tinctures of leaf D. In preliminary experiments the clinical assay-method was shown to be capable of distinguishing among tinctures of the relative strengths 75 100 125. In the cases of these two samples of digitalis leaf, therefore, assay in the mammal indicated potency more accurately than assay in the frog —R C LI and H B VAN DYKE *J Pharmacol*, 54 (1935) 151 (H B H)

Digitalis Lanata Ehrh.—Pharmacological Investigation on. The toxicity of the leaves of *Digitalis lanata* is distinctly greater (25%) than that of *Digitalis purpurea*. The toxicity of the powdered *Digitalis lanata* does not vary, even after a year of storage in an atmosphere of carbon dioxide. The leaves treated with chloroform and dried in a current of warm air are less active than those dried at ordinary temperature and without special treatment —A RABBENO and C MARINI *Boll Soc Ital Biol Sper*, 9 (1934), 748-750, through *Chimie et Industrie*, 33 (1935), 677 (W A P)

Dinitrophenol—Action of, on Rate of Oxidation of Ethyl Alcohol in Vitro. At a pH of 7.4 concentrations of dinitrophenol from 1-5,000,000 to 1-20,000,000 slightly increased the rate of oxidation of alcohol by rat liver *in vitro*, while higher concentrations slightly diminished it. This indicated that under some conditions an increase of tissue metabolism produced by dinitrophenol is accompanied by an increased rate of oxidation of alcohol —H W NEWMAN, W C CUTTING and M L TAINTER *Proc Soc Exptl Biol Med*, 32 (1935), 1479 (A E M)

Drugs—Absorption of, Through the Oral Mucosa. II. The ratio of sublingual to similarly effective subcutaneous doses was determined as follows. Cocaine 2 diacetylmorphine 3, thebaine greater than 4 emetine greater than 6 —ROBERT P WALTON *Proc Soc Exptl Biol Med*, 32 (1935), 1486 (A E M)

Drugs—Absorption of, Through the Oral Mucosa. III. Fat-Water Solubility Coefficient of Alkaloids. The oil-water solubility coefficient is an important factor in the selective oral absorption of alkaloids. Other factors which are significant are relative potency, degree of local vasoconstriction, irritation and alkalinity or acidity —ROBERT P WALTON *Proc Soc Exptl Biol Med*, 32 (1935), 1488 (A E M)

Drugs—Distribution of, in Different Parts of Central Nervous System and Their Quantitative Microdetermination in Tissues. VI. Chloral Hydrate. Data are given on the distribution of chloral hydrate (I) in various parts of the nervous systems of cats and dogs, at various intervals after administration. I was extracted from the tissues with ether and the ether residue taken up in dilute sulphuric acid. I was determined by reduction with zinc dust in acetic acid solution and titration of the chlorine according to the Volhard method. I appeared and disappeared more rapidly from the portions rich in cells. Maximum concentration was reached in a few minutes in all parts —M VOGT *Arch exptl Path Pharmacol*, 178 (1935), 628, through *Squibb Abstr Bull*, 8 (1935) A-969

Ephedrine—Observations on Dogs under Continued Influence of. Remarkable constancy is found in the systolic blood pressure of dogs in standard conditions. Ephedrine produces a disturbance of nitrogen metabolism, probably by diminishing the assimilation of protein. A transient diuresis is always observed. Glycosuria usually persists after withdrawal. Tolerance to the

pressor action of ephedrine is manifested Ephedrine administration in doses that maintain a continuous hypertension may be continued for 2 weeks without other effects, the blood pressure and protein absorption return to normal within a few days of withdrawal —ERIC OGDEN and A R TEATHER *J Pharmacol*, 54 (1935), 320 (H B H)

Ergoclavine—Action of, on Diuresis Ergoclavine is a new alkaloid obtained from ergot of rye and has pharmacological action similar to that of ergotamine and ergotamine With respect to its action on diuresis, ergoclavine in doses of 0.0075–0.04 mg per Kg intramuscularly diminished considerably the amount of fasting urine in dogs, and also inhibited the diuresis following the ingestion of water or sodium chloride solution, but to a smaller extent than did the injection of 0.15–0.2 mg of ergotamine Unlike the latter compound, ergoclavine did not decrease diuresis caused by a urea solution, but rather increased it —E ZUNZ and O VESSELOVSKY *Compt rend soc biol*, 119 (1935), 534, through *Squibb Abstr Bull*, 8 (1935), A 925

Ergoclavine and Sensibamine—Action of The author concludes that the new ergot alkaloids, ergoclavine and sensibilamine, produce pharmacological effects identical in character and intensity with those of ergotamine, and therefore with those of ergotamine also These comparative studies were made upon the isolated guinea pig and rabbit uterus as well as upon the "vasomotor reversal" preparation of the cat —A VARTIAINEN *J Pharmacol*, 54 (1935), 259 (H B H)

Ethyl Alcohol—Effect of Certain Drugs on the Metabolism of Alcohol was administered to dogs by stomach tube in doses of 15 or 30 Gm per Kg and determinations of blood alcohol made over a period of twelve hours The normal blood alcohol curve was not changed by the administration of one unit of insulin per Kg, either when the insulin was given alone or with sufficient glucose to prevent a drop of blood sugar Large doses of thyroxine or desiccated thyroid administered some days prior to the alcohol experiment caused very little change, if any, from the normal curve On the other hand the disappearance of body alcohol was greatly accelerated by the administration of dinitrophenol in a dose of 7.5 or 15 mg per Kg, the rate of alcohol consumption by the tissues being about doubled in some cases Dinitrocresol in a dose of 7.5 mg per Kg produced about the same results as did twice this dose of dinitrophenol Determinations of the loss of alcohol by breath showed that only a small part of the effect produced by the dinitro compounds was due to increased excretion by the lungs The doses of the dinitro compounds necessary to cause much acceleration in body oxidation of alcohol are probably too toxic for them to be of any practical use in the treatment of acute alcoholism and the results are presented solely for their scientific value —R N HARGER and H R HULPIEU *J Pharmacol*, 54 (1935), 145 (H B H)

Lanadigin, Digitoxin and Ouabain—Cumulative Poisoning by Lanadigin (or digilamid C) has been considered, by clinical test, to be a relatively non-cumulative glucoside It was compared with U S P ouabain and digitoxin by assay in the frog and dog and found to be of the same toxicity as digitoxin in the dog but about twice as toxic as digitoxin in the frog In cumulation experiments in dogs, lanadigin proved clearly to be a more powerful cumulative poison than either ouabain or digitoxin —H B VAN DYKE and R C LI *J Pharmacol*, 54 (1935), 161 (H B H)

Local Anesthetics—Relation of pH and Surface Tension to Activity of The authors report observations upon the relation between surface tension and physiological activity for ten local anesthetics at varying known hydrogen ion concentrations The following substances were studied: B-4-morpholine ethyl benzoate hydrochloride, B-4-morpholine ethyl cinnamate hydrochloride, B-4-morpholine ethyl phenylurethane hydrochloride, B-4-morpholine ethyl α -naphthylurethane hydrochloride, G-4-morpholinepropyl benzoate hydrochloride, G-4-morpholinepropyl cinnamate hydrochloride, G-4-morpholine propyl phenylurethane hydrochloride, G-4-morpholinepropyl α -naphthylurethane hydrochloride, cocaine and procaine Both surface tension lowering and anesthetic activity vary with the pH in a manner paralleling the titration curves, indicating that both effects can be attributed only to the base No correlation between surface tension lowering by the individual compounds and their physiological activity could be detected —JOHN H GARDNER and JOSEPH SEMB *J Pharmacol* 54 (1935), 309 (H B H)

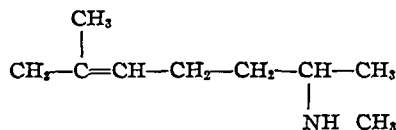
Luteal Hormone—Biological Study and Testing of The horns of the rabbit uterus at time of puberty appear small, very slightly vascular and slightly muscular Only a very small amount of blood vessels are visible, and the epithelium is simple Injection of luteal hormone alone pro-

duces no change. If some follicular substance is included, there is an increase in diameter in the horns of the uterus, the muscular appearance changes and the secretion is altered. Further injection causes intense reactions, the horns become extremely large, moist and congested, the muscular layer disappears and blood vessels appear in the form of a network. These vessels are dilated. The determination is carried out as follows: Inject subcutaneously into a 800-800 Gm Parisienne rabbit, at time of puberty, during 6 consecutive days, 4 mg per day of crystalline follicular substance contained in an oil solution. Also inject subcutaneously during the next 6 days the substance to be studied, in an oil solution. At the end of the twelfth day the animal is killed, the uterus removed and placed in formaldehyde solution. An examination in an Ultrapak is immediately carried out. Standard unit setup is the amount of luteal substance which corresponds to the physiological activity obtained by injection into an 800 Gm rabbit at age of puberty, after subcutaneous administration of follicular substance, of 0.2 mg of crystalline luteal hormone prepared in oil solution and injected during 6 consecutive days.—H. PENAU and H. SIMONNET, *J. pharm. chim.*, 21 (1935), 485 (M. M. Z.)

Male Hormone—Biological Estimation of, upon the Hardhead. A critique of the two currently used methods of standardization supplemented with a report of an improvement in the castration technique of Glaser and Haempel. B's technique consists in anesthetizing the fish with urethane or soneryl and then making as short a ventral incision as is possible with the aid of fine scissors at the area of the genital buds. The gonads are exposed carefully with the aid of surgical forceps, and then removed. The operative area is dried with absorbent cotton or surgical gauze, 'painted' with ether and sealed with collodion. The per cent recoveries by this technique, on two lots, were 89 and 100 respectively, as compared with the approximate 50% recoveries obtained with the straight G and H technique. B finds the intramuscular route the best method of giving the orchic extracts to the test objects. In no instance, did a non active extract, as determined on castrated test objects, prove to be active when intact fish were used. Careful temperature control and utilization of as large a number of fish as is practical are of paramount importance for accurate work.—A. BEAUNE, *Bull. sci. pharmacol.*, 42 (1935), 193 (C. T. I.)

Mannide and Isomannide—Fate of, in the Animal Body. The chemistry of mannitol, isomannide and mannide is reviewed briefly and the structural formulae are given. The results are summarized as follows: 1. The removal of 2 molecules of water from 1 molecule of mannitol with the formation of isomannide or mannide destroys the capacity of mannitol to be stored as glycogen in the liver of the white rat. 2. Mannide significantly increases the respiratory quotients of white rats, while isomannide does not. 3. Isomannide and mannide are ineffective in relieving insulin shock in mice and are also incapable of raising the fasting blood sugar level of rabbits.—J. C. KRANTZ, JR., W. E. EVANS, JR. and C. J. CARR, *Quart. J. Pharm. Pharmacol.* 8 (1935), 213-217 (S. W. G.)

Methylamino-methyl Heptene—Pharmacological Action of. This compound has the formula



It is a sympathetico-mimetic-amine which stimulates the respiratory center and to a lesser degree other parts of the central nervous system. It relaxes those smooth muscles which have an inhibitory innervation from the true sympathetic: the stomach, intestine, etc., but it dilates the pupil, stimulates the heart and will sometimes restore a heart with fibrillating auricles to a normal beat. With correct dosage and under suitable conditions the drug is capable of producing a great rise of arterial pressure which may not come down to normal for two or three hours. On intravenous injection of the drug the volume of the kidney, spleen, etc., shrinks; the stomach relaxes, the mucosa of the nose and pharynx shrinks greatly and the bronchioles dilate. The drug has a trade name 'octin,' is markedly slower in action than epinephrine, and will have a very considerable clinical use.—D. E. JACKSON, *J. Pharmacol.*, 54 (1935), 152 (H. B. H.)

Morphine—Action of, as a Metabolic Stimulant. Fifty-one successful experiments were made upon four dogs studied systematically at the fourth, eighth, sixteenth and twenty-fourth hour after the daily injection. The average metabolic increases for the entire twenty-four hours were

found very significant, being respectively 11.2, 7.3, 4.8 and 14.8%. The authors emphasize the importance of maintaining the adult animals at constant body weight and upon a practically perfect state of rest during the tests which were made in a copper chamber with closed Benedict Universal Apparatus—H. G. BARBOUR and JANET ANDREWS *J Pharmacol*, 54 (1935), 137

(H. B. H.)

Morphine, Codeine, Heroin and Dilaudid—Comparative Study of Analgesia Produced in Normal Subjects by The table gives the average results from five subjects, selected for their analgesic response, to whom various doses of the four drugs were administered subcutaneously at weekly intervals. Five sensitive face spots as determined with von Frey hairs were employed to measure the degree of analgesia. Neither the subject nor the observer had knowledge of the drug or dosage used.

	Dose Required to Give Equal Peaks of Analgesia Mg	Peak of Analgesia Reached Minutes	Duration of Analgesia Minutes	Subjective Degree of Depression	Subjective Degree of Euphoria
Morphine sulphate	8	90	200	5	1
Codeine phosphate	64	30	150	1	0
Heroin hydrochloride	1-1.5	30	130	2	4
Dilaudid hydrochloride	0.8	90	165	3	1

No definite correlation can be made between the subjective sensation of depression and the actual analgesia obtained. In confirmation of Mullin and Luckhardt it is noted that hyperalgesia often follows the period of analgesia even though the individual is still subjectively depressed at the time. A most constant and striking finding is the difference in time required after administration for the various drugs to produce their maximum analgesic action. Although solubility is not the only factor involved, rapid onset of analgesia does occur with the most soluble salts—C. C. PFEIFFER and M. H. SEEVERS *J Pharmacol*, 54 (1935), 156

(H. B. H.)

Nicotine—Contribution to Pharmacology of This study was made to determine the nature of the nicotine action causing failure of respiration in cats. Application of fairly large doses of nicotine to the floor of the fourth ventricle failed to paralyze respiration. The minimal lethal dose by intravenous injection was found to be consistently smaller than by intracarotid injection. Following the administration of the minimal lethal dose stimulation of the phrenic nerve and of the diaphragm directly showed that the myoneural junctions had been completely, or almost completely paralyzed. A record of phrenic nerve potentials showed that when the muscles of respiration had ceased to function as a result of nicotine the intermittent discharges from the respiratory center continued as in the normal. From the above evidence the authors conclude that nicotine causes respiratory failure as a result of a curare-like peripheral paralysis—HARRI GOLD and FRED ERICK BROWN *J Pharmacol*, 54 (1935), 143

(H. B. H.)

Parathyroid Hormone—Use of Rabbits in the Standardization of The blood serum of rabbits has been found to respond to injections of parathyroid extract given together with oral administrations of calcium chloride. The variations in the calcium concentrations in the serum of rabbits was found to be of a qualitative rather than a quantitative nature. The method of Hamilton and Schwartz (*J Pharmacol*, 46 (1932), 285) or its modification by the author may be used to detect, but not to measure small quantities of parathyroid hormone. The results of the experiments are given in tables and plotted curves—F. J. DYER *Quart J Pharm Pharmacol*, 8 (1935), 197-212

(S. W. G.)

Phenobarbital—Effects of Phenacetin and Aspirin, Respectively, upon Action of Whereas acetylsalicylic acid antagonizes the hypnotic action of phenobarbital, phenacetin in no way diminishes its activity. Phenacetin may exert a protective influence by antagonizing the toxic effects of phenobarbital—ALFRED GILMAN and HENRY G. BARBOUR *Proc Soc Exptl Biol Med*, 32 (1935), 1634

(A. E. M.)

Pituitary Extract—Hypersensitiveness to A case report in which a 28-year old housewife, without personal or family history of allergic diseases, exhibited a severe hypersensitivity to a dose of pituitary extract at the birth of her seventh child. Massive swelling of the lips and face was noted and the patient complained of a swollen tongue. She began to have difficulty in breathing, which was evidently due to obstruction in the upper respiratory tract. The edema of the larynx

increased rapidly and she had more respiratory difficulty. The administration of epinephrine relieved the situation and she recovered completely. Subsequent skin tests showed positive reactions to cattle, hog and human pituitary extracts, but negative reactions to cerebral cortex and skeletal muscle extracts of cattle, hogs or humans.—F A SIMON *J Am Med Assoc* 104 (1935), 996 (M R THOMPSON)

Potassium Salts—Diuretic Action of Doses of from 0.1 to 0.2 Gm per Kg daily for several days of potassium chloride, nitrate, bicarbonate, acetate and citrate were given by mouth to normal individuals and patients having edema, in some of the latter, kidney disease was present. These salts lead to the increase of excretion of water and potassium in the urine, the most regular and sustained diuresis occurred with the nitrate. The kidney was able to concentrate the potassium of the serum approximately fifty times. When this concentrating function is preserved in renal disease, potassium salts seem to be well tolerated.—NORMAN M KEITH and MELVIN W BINGER *J Pharmacol*, 54 (1935), 148 (H B H)

Pukateine—Pharmacological Action of The alkaloid, pukateine can be extracted from the bark of the Pukatea tree (*Laurelia Novae Zealandiae*, Monimiaceae). It has the formula $C_{15}H_{11}O_3N$, and the constitution has been established by Barger and Girardet. In the form of the hydrochloride pukateine has the following minimal lethal doses in terms of grams per kilogram body weight: frog, 0.25 (anterior lymph sac), mouse, 0.18 (subcutaneously), rabbit 0.12 (intravenously) and 0.2 (subcutaneously). It tends to depress all muscle tissue with the possible exception of the uterus. It depresses conductivity of the nerves. The action upon the central nervous system is similar to that of morphine, the depressive effect being most marked upon the respiratory center. It produces a peripheral vaso dilatation and this in conjunction of the diminished cardiac output produces a fallen blood pressure. The effect on the refractory period and the ability to prevent cardiac fibrillation is also described.—WILLIAM S FOGG *J Pharmacol*, 54 (1935), 167 (H B H)

Pyrethrins—Action of, on Marine Animals A pharmacodynamic study of the neuro muscular toxic activity of pyrethrins. The tests were carried out (1) by placing the test object in dilute emulsions of the pyrethrins, thereby allowing the animal to absorb the toxic agents by the respiratory tract, and (2) by administering the pyrethrins hypodermically. In each instance control tests were carried out to ascertain the effect of the dilutions of alcohol present in the emulsions. The pyrethrins are more active upon fish, crustacea and cephalopod molluscs when the toxic agents are taken up by the respiratory tract. Fish are also very sensitive to hypodermic doses. The echinoderms are practically unaffected by pyrethrins when administered by either of the above routes.—O GAUDIN *Bull sci pharmacol* 42 (1935), 145, 222 (C T I)

Retrorsine—Action and Toxicity of Retrorsine, an alkaloid of *Senecio retrorsus*, in the form of a hydrochloride induces weakness and paralysis of the extremities of frogs in the dosage of 1 mg per Gm. In white mice it causes acute death within two and one half hours with clonic convulsions in the dosage of 290 or more mg per Kg, injected intravenously. Doses of 70 to 145 mg per Kg, produce no convulsions but hepatic necrosis and renal degeneration in the majority of animals, and finally death in one to eight days. In guinea pigs, the minimal lethal dose of retrorsine hydrochloride by intravenous injection is approximately 320 mg per Kg. An amount equivalent to 50% of the minimal lethal dose, repeated every other day for four doses failed to bring about any visceral changes in ten days. The guinea pig is apparently less susceptible than the mouse to this alkaloid. Retrorsine has a depressor and a hyperglycemic action. It inhibits isolated rabbits' intestines, but contracts isolated guinea pigs' virgin uteri.—K K CHEN, A LING CHEN and CHARLES L ROSE *J Pharmacol*, 54 (1935), 299 (H B H)

Sedatives and Hypnotics The author discusses the physiology of the nervous system briefly and mentions some of the desirable qualities in medicaments. He describes the pharmacological action of the various classes of sedatives and hypnotics such as chloral, paraldehyde, the barbitol derivatives, bromides, cocaine, organic bromine compounds, scopalamine and others.—ALFRED FRÖHLICH *Scientia Pharm*, 6 (1935), 57 (M F W D)

Sodium Propyl-Methyl-Carbinyl-Allyl Barbiturate A Short-Acting Hypnotic. The drug was compared with pentobarbital sodium and amytal. Oral administration causes earlier appearance of ataxia. The duration of anesthesia was longer than with pentobarbital and about the same as with amytal. However, the time of recovery was only half that of sodium amytal.—EDWARD E SWANSON *Proc Soc Exptl Biol Med*, 32 (1935) 1563 (A F M)

Sodium Thioethanesulphonate—Metallic Derivatives of, in Therapeutics Organometallic compounds containing the —SH group in which H is replaced by gold, bismuth, antimony, mercury and other heavy metals, were prepared by the following series of reactions $\text{CH}_3\text{Br} \cdot \text{CH}_3\text{Br} + \text{Na}_2\text{SO}_3 = \text{CH}_3\text{BrCH}_2\text{SO}_3\text{Na} + \text{NaBr}$, $\text{CH}_3\text{BrCH}_2\text{SO}_3\text{Na} + \text{NaHS} = \text{HSCH}_2\text{CH}_2\text{SO}_3\text{Na} + \text{NaBr}$, treatment of the mercaptan with gold chloride gives $\text{AuSCH}_2\text{CH}_2\text{SO}_3\text{Na}$, amorphous, very light yellow containing 53% gold (theoretical 54.7%), remains unchanged when heated to 170°, above 170° gradually turns yellow and becomes light brown at 280°, easily soluble in water to a barely perceptible yellow, insoluble in oil and in all organic solvents, unaffected by the usual reagents for gold (except hydrogen sulphide which produces first a brown coloration and finally a precipitate of sulphide, stannous chloride in hydrochloric acid solution and nitric acid destroy the complex with precipitation of gold). A 5% solution, when injected subcutaneously or intramuscularly, is easily absorbed, it produces no shock phenomenon when injected intravenously. In spite of its high gold content, it is a little less toxic than most of the other gold thioderivatives (about 0.05 Gm. per kilo body weight), with the exception of the metallic thioderivatives of sugars, but the lower toxicity of the latter is accompanied by a correspondingly low activity.—AUGUST LUMIERE and FÉLIX PERRIN *14me Congrès de Chimie Industrielle, Paris*, Oct. 21-27, 1934 (A P-C) 3 pp

Spinal Anesthesia in the Rabbit Therapeutic Coefficients The minimal lethal dose as well as the minimal anesthetic dose by subarachnoidal injection was established for several anesthetics upon rabbits. From these two threshold concentrations the therapeutic coefficients for these anesthetics can be calculated as follows: metycaine, 4.0; procaine, 6.6; panthesine, 8.0; nupercaine, 11.4; tutocaine, 12.0; and pantocaine, 30.0.—R. N. BIETER, R. W. CUNNINGHAM, O. LENZ and J. W. MCNEARNEY *J. Pharmacol.* 54 (1935) 137 (H B H)

Syntropan—Contribution to the Pharmacology of The results of the various tests carried out, together with reproductions of kymograph tracings, are presented. The following conclusions have been drawn: 1. Syntropan has m.l.d. 1.1 Gm. per Kg. of body weight of toad intralymphatically in 18 hours and 316 mg. per Kg. of body weight of rabbit hypodermically in 40 minutes. Post mortem examination revealed no organic lesions. The heart was arrested in diastole with venous congestion. 2. In the toad and rabbit, syntropan in small doses stimulates the cerebrum and, if the dose is high, convulsions occur, which are central in origin. In fatal doses the drug paralyzes the cerebrum and the respiratory center. 3. In stronger solutions, syntropan acts like atropine in antagonizing the effect of arecoline hydrochloride on heart, intestine and ureter. 4. In the dog, syntropan in moderate doses lowers the blood pressure in spite of the acceleration of heart beat and vasoconstriction. The drug depresses the cardiac muscle directly. Syntropan stimulates the respiratory center in small doses. 5. There is no evidence that syntropan is a valuable drug for the relaxation of plain muscle tissue. In fact the uterus and mesenteric vein respond to the drug by a rise of tone. 6. The drug has practically no action on the gastrocnemius muscle of the toad in a 1:1000 solution. 7. The dilatation of the pupil of the rabbit produced by strong solutions of syntropan is inferior to that produced by atropine in more dilute solutions.—KARAM SAMAN and MOHAMED I. EL ASREGY *Quart. J. Pharm. Pharmacol.*, 8 (1935), 186-196 (S W G)

Thyroid—Pharmacology of, in Man A review, with discussion, of the effects produced by thyroid, thyroxine and certain compounds structurally related to thyroxine upon clinical patients. The iodine content of desiccated thyroid, with its relationship to calorogenic activity receives interesting consideration. It has been calculated that in a normal man the thyroid forms thyroxine or its equivalent at the rate of about 0.3 mg. a day and that there are about from 10 to 14 mg. in the body outside of the thyroid gland. Following the intravenous administration of a single dose of 10 mg. of thyroxine to a patient with myxedema, there is a marked lag in the clinical improvement behind changes in the metabolic rate, the period of highest metabolism being characterized by intoxication and the period of falling metabolism by improvement. Observations on the calorogenic action of diiodotyrosine, thyronine, diiodothyronine and N-acetyl thyroxine show that the amino group, the diphenyl ether group and all four iodine atoms are essential for the maximum effect of thyroxine. Of special interest is the rather rapid return of the metabolism to the level before treatment following a single dose of diiodothyronine (from seven to eight days respectively in two patients with rates of minus 35% and minus 40%) compared with the slow return following a single dose of thyroxine (from seventy to eighty days at a level of minus 40%). The increase

in metabolism produced by dinitrophenol in myxedema, with little or no clinical improvement, suggests that there may be different types of altered metabolism that cannot be differentiated by changes in the rate of oxidation alone. As the complexity of the molecule of various thyroxine compounds increases, the greater will be their absorption from the gastro-intestinal tract and hence the less the effect of alkali in augmenting the absorption. As a result of digestion with pepsin, data have been obtained which suggest that nearly all the calorogenic activity of the whole gland is possessed by less than half of the total iodine (acid-insoluble precipitate). The acid soluble portion does possess slight calorogenic activity and after a single large dose the metabolism appears to return to its level before treatment more rapidly than after an equal change produced by the acid-insoluble precipitate. This finding has an important bearing on the U S Phar method of standardizing desiccated thyroid by a determination of the total organic iodine. After heating with approximately normal sodium hydroxide for four hours, desiccated thyroid loses more than two-thirds of its calorogenic activity, whereas thyroxine is unaffected by the same treatment. This finding has an important bearing on the proposed standardization of desiccated thyroid by a determination of its thyroxine content. The subcutaneous administration of extracts of the anterior lobe of the pituitary produced an increase in basal metabolism in eighteen of twenty eight patients of various types including two with hypopituitarism, ten with low basal metabolism of unknown cause, several with nontoxic goiters, including three patients with mild myxedema, and one case of exophthalmic goiter. During the injections in the patient with exophthalmic goiter, a mild case of the disease became a moderately severe one.—W O THOMPSON, *et al* *J Am Med Assoc*, 104 (1935), 972 (M R THOMPSON)

Trichlorethylene—Contribution to Pharmacology of Trichlorethylene in amounts of 0.12 cc per 100 Gm of rat subcutaneously did not influence oxygen consumption. In perfused amphibian heart it had solely a depressant effect. When administered by inhalation to etherized dogs, it produced a fall in blood pressure and tended to diminish the rate and increase the depth of respiration. The influence of the drug on the coronary flow (Moravitz preparation) was irregular, in some cases it produced a decrease and in others an increase in the rate of flow. The authors are of the opinion that the drug exerts no specific influence on the coronary circulation. The relief afforded by trichlorethylene in certain cases of angina pectoris might be accounted for on the basis of its sedative action.—J C KRANTZ, JR, C J CARR, RUTH MUSSER and W G HARNE *J Pharmacol*, 54 (1935), 327 (H B H)

Ureas—Relative Anesthetic Effects of Various Hypnosis has been found to be a property quite common to the ureas. With respect to hypnotic effectiveness, in the alkyl ureas molecular weight is a determining factor, as with the aliphatic alcohols. In general, in the aliphatic ureas the hypnotic potency decreases in the following order, monoalkyl ureas, symmetrical dialkyl ureas (methyl series), unsymmetrical dialkyl ureas, symmetrical dialkyl ureas (ethyl series) and trialkyl ureas. The toxicity values are not consistent, thus making generalization concerning this property difficult. In the aryl and alkylaryl ureas molecular weight is not an important factor in determining hypnotic effectiveness. In these series, the position of a substituent group in position isomers is more important.—J S BUCK, A M HJORT and E J DE BEER *J Pharmacol*, 54 (1935), 188 (H B H)

Vitamin B—Studies of Crystalline IV **Injection Method of Assay** A modification of the Smith injection technique for vitamin B assay is described which is quick, convenient and reasonably accurate. The material to be tested is injected from a tuberculin syringe through a 26 gage needle into the fleshy part of the rat's hind leg. As much as 0.75 cc of the liquid (pH 4.0-6.0) containing as high as 10% solids can be introduced into each leg subcutaneously with satisfactory results. The effect can be noted within 12-48 hours. With an adequate dose the symptoms of paralysis disappear entirely with an accompanying gain in weight. If the dose is very inadequate, the symptoms are not alleviated and may become definitely worse and there is generally a loss in weight. If the injected dose is barely adequate, a partial cure may result. With minimum curative doses paralysis recurs in 5-10 days after successful treatment. As a result of an extremely large dose animals have remained cured for as long as 32 days. Surviving animals that are not cured by the first injection are used again after the lapse of one day. Those that are cured or definitely improved are kept on the depletion diet until paralysis recurs and are then reinjected. In this way, the same rat can be used several times. The curative dose according to the response standard established is 5γ. The minimum dose which completely cures practically every animal

js 75γ—M AMMERMAN and R E WATERMAN *J Nutrition*, 10 (1935), 25, through *Squibb Abstr Bull*, 8 (1935), A-1019

TOXICOLOGY

Amidopyrine—Toxic Reactions of Therapeutic doses of amidopyrine, e g, 0.2–0.648 Gm, can exert a harmful effect on the general condition of sensitive persons (fever, chill, nausea, headache, etc) and on the activity of blood forming organs. The effect on the granulocytopoietic apparatus is stimulating as well as inhibitive, decrease in the total granulocyte value and increase in the immature and young elements. In individual cases, there is a subsequent leukocytosis. The amidopyrine effect extends to the monocyte- and lymphocyte producing organs and also to erythropoiesis. These changes recede spontaneously when the drug is discontinued, otherwise it is to be expected that the initial symptoms advance to a marked granulocytopenia with typical clinical manifestations. Three cases described by Bonsdorff, of which two were fatal, illustrate this. It is of utmost significance whether other antipyretics are capable of producing granulocytopenia. Antipyrine, the parent substance of amidopyrine and its derivatives, fall in this group. Several cases of granulocytopenia have already been reported with antipyrine. Salicylic acid has not yet been found to be an offending substance in humans, but it has been observed to cause granulocytopenia in animals. Barbituric acid preparations are dangerous because they are often combined with amidopyrine. Indeed one of the acids, 5 ethyl 5 phenyl barbituric acid (Luminal) has been reported as causing a decrease in the granulocytic value in animals.—B v BONSORFF *Klin Wochschr*, 14 (1935), 465, through *Squibb Abstr Bull*, 8 (1935), A-563.

Arsine—Poisoning by A detailed description of a case in which an accidental fatal poisoning was traced to arsine from the circumstances accompanying the accident and the clinical symptoms, in spite of the fact that no arsenic was found in the analysis of the viscera. Death occurred 8 days after the victim had cleaned out the sludge from a tank 1 m high by 2 m in diameter, used for the purification of pyrites burner gases, the work having required only about 10 min. The sludge consisted of 13% iron sulphate, 84% lead sulphate and 2.6% arsenious oxide, instead of wooden tools, as usual, the victim had used an iron scraper which showed distinct signs of attack by acid. It was concluded that, in spite of the preliminary washing with water, there remained sufficient acid in the sludge to react with the scraper, with evolution of hydrogen which reacted with the arsenious oxide to form arsine.—J LECLERCQ and H SPRIET *Ann Med Légale Criminol Police Sci*, 15 (1935), 362–366. (A-P-C)

Arsphenamine—Ocular Reactions Due to In twenty cases of primary and secondary syphilis (19 had early syphilis) treatment with arsphenamine produced toxic ocular reactions of varying degree. The initial signs were usually subjective and unilateral and frequently so slight as to produce no detectable eye changes, usually, however, there was slight haziness of the vitreous or blurring of the nerve head. Continuation of arsphenamine aggravated the condition producing considerable optic neuritis and possibly secondary optic atrophy. Vision improved fairly rapidly and returned to normal if the arsphenamine was discontinued when the first symptoms were observed. Further antisyphilitic treatment with iodides, bismuth or mercury caused no ocular symptoms and did not prevent the return of the eye condition to normal. Subsequent treatment with arsphenamine was possible in most cases if given cautiously with cessation at the first signs of ocular symptoms, but some cases showed hypersensitivity to the drug. Of the twenty cases with ocular symptoms, nine showed other arsphenamine reactions including nutritive reactions, dermatitis and postarsphenamine hepatitis with jaundice. None of the cases showed any signs of neurosyphilis.—J J SKIRBALL and F M THURMON *Am J Syphilis & Neurol*, 19 (1935), 197, through *Squibb Abstr Bull*, 8 (1935), A-644.

Atropine—Action of, on Reanimation of Heart in Secondary Chloroform Syncopes The author points out that reported differences in the action of atropine in the heart in chloroform poisoning have been due to differences in the mode of injection. The author has injected atropine directly into the heart successfully, in contrast to results reported following injections into the jugular vein.—L GARRELON *Compt rend soc biol*, 118 (1935), 854, through *Squibb Abstr Bull*, 8 (1935), A-646.

Aurotherapy—Dangers in Therapeutic use of gold may cause modifications in the blood (eosinophilia and agranulocytosis). The symptoms which are associated with true saturation (coated tongue, nausea, diarrhea) resemble the picture obtained in the case of uremia, in fact, in

these cases, amounts of urea as high as 50-60 cg have been found. It is well to detect these slight azotemias, since they are forerunners of polynucleosis and therefore of saturation. Regular examination of the constituents of the blood should be carried out during gold therapy.—R. DULAL *Bruxelles-Med*, No 23 (1935), through *J pharm Belg*, 17 (1935), 472 (S W G)

Benzene—Experimental Research on the Toxicity of the Vapors of Concentration of Benzene in the Blood and Speed of Removal. A study of guinea pigs, weighing 800-850 Gm and subjected to benzene vapors, showed that the benzene content of the animal, especially with higher concentrations (20-50 mg /liter) is a linear function of the duration of inhalation, up to 20 minutes. The most severe symptoms are noticeable when the benzene content of the blood is 2.6-2.8 mg per 100 Gm of animal. Benzene vapors introduced into the animal by inhalation disappear quickly from the blood, when air is free from vapors, and the symptoms vanish. The vapors are eliminated chiefly by the lungs and partly by the kidney.—MARCEL PERONNET *J pharm chim*, 21 (1935) 503 (M M Z)

Bichloride of Mercury—Quantitative Study of Renal Injury in a Case of Acute Poisoning by A quantitative study of a case of acute mercuric chloride poisoning showed that extensive renal damage occurred almost immediately, lasted for several weeks and then improved slowly with return to normal function three and one half months after poisoning.—R. H. FREYBERG and F. H. LASHMET *Am J Med Sci*, 189 (1935), 392 through *Squibb Abstr Bull*, 8 (1935), A 589

Bromides—Toxic Reactions of A report of five cases of bromide intoxication observed in general medical practice. The recommended treatment is sodium chloride orally (6-8 Gm daily), by hypodermoclysis or intravenously.—E. H. HASHINGER and C. C. UNDERWOOD *J Kansas Med Soc*, 36 (1935) 183, through *Squibb Abstr Bull*, 8 (1935), A-752

Carbon Monoxide Poisoning—Chronic Effects on persons exposed to carbon monoxide for many years show that occurrence of chronic carbon monoxide poisoning cannot be doubted. Carbon monoxide haemoglobin is dissociated through abundant ventilation but this does not take place completely. A residue of carbon monoxide haemoglobin always remains.—HERMAN GERBIS *Deut Med Wochschr*, 61 (1935) 991-994 (H R)

Datura Stramonium—Food Poisoning from The authors describe an epidemic of food poisoning in Amsterdam involving at least 34 cases. The epidemic was caused by a grocery firm supplying a preserving factory leaves of *Datura Stramonium* in error, for savory.—H. PEETERS and J. C. DE JONG *Pharm Weekblad*, 72 (1935) 715 (E H W)

α -Dinitrophenol—Chronic Lesions Produced by When administered to guinea pigs in amounts approximating the human therapeutic dose, α dinitrophenol produced hepatic lesions giving no external symptoms and shown to be due to the nitro groups.—R. JONNARD *Ann Méd Legale Criminol Police Sci* 15 (1935), 181-183 (A P C)

Mercurial Diuretics—Reaction at Site of Injection of, as Influenced by Theophylline It has been demonstrated in animals and in man that the presence of theophylline in combination with a mercurial diuretic definitely decreases the local toxic reaction.—ARTHUR C. DEGRAFF and ROBERT C. BATTERMAN *Proc Soc Exptl Biol Med* 32 (1935), 1546 (A E M)

Methylene Blue, Methemoglobin and Cyanide Poisoning Methemoglobin does not accumulate in significant quantities in the blood of dogs after intravenous injection of clinically recommended quantities of methylene blue. This fact, however, should not bring into question the proposed methemoglobin explanation of the dye's action in cyanide poisoning. The failure of methemoglobin to accumulate is explicable on the basis of the known behavior of the reactions involved, namely the reduction of the formed methemoglobin by leuco methylene blue and the enzyme systems present in the erythrocytes, and the rapid disappearance of the injected dye from the blood. *In vivo* formation of methemoglobin is readily demonstrable after administration of both cyanide and methylene blue because of the stability of the cyanmethemoglobin which is formed. Considerably more than half of 2 M. L. D. of subcutaneously administered cyanide is demonstrably bound in the circulating erythrocytes of dogs injected with methylene blue immediately before administration of the cyanide. When the dye is injected continuously throughout the period of cyanide absorption a still greater fraction of the cyanide is bound in the blood. The principal action of methylene blue in counteracting the toxic effects of cyanide appears to depend

therefore, upon methemoglobin formation In the absence of experimental demonstration that methylene blue can replace the cyanide sensitive catalysts which are concerned with vital processes, the methemoglobin explanation appears to be all that is required —WILLIAM B WENDEL *J, Pharmacol*, 54 (1935), 283 (H B H)

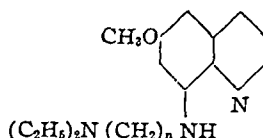
Phenolphthalein—Reactions Caused by A survey of the literature on reactions caused by phenolphthalein shows that the reports deal mainly with the general constitutional effects, *e g*, syndromes in which circulatory, renal or nervous disturbances predominate, and with cutaneous eruptions The total number of reactions observed is small considering the extensive use of the drug Most of the reactions were noted after a single or occasional average dose Nine cases of systemic disturbances resulting from an overdose and 6 cases of possible cumulative action are somewhat offset by 11 reported instances of no apparent ill effects from overdosage The laxative dose of the white phenolphthalein is 3 times that of the yellow which contains more of a residue known as the 'dark bodies' Compounds from which phenolphthalein is prepared and related derivatives were not responsible for the cutaneous lesions, nor was the vehicle responsible for the eruptions Chemical and microscopical examination of the blood and urine in normal persons showed no noticeable difference before and after use of the drug Eruptions may appear after the first dose suggesting previous contact, or the occasional use of an average dose may bring on a sudden development of hypersensitivity Phenolphthalein, but none of the other commoner drugs reproduced the cutaneous lesions The reactions suggest an allergic response in persons sensitized to the drugs In most cases skin tests are negative Abramowitz assumes that there is a form of specific hypersensitiveness, allergic in nature, in patients who have eruptions due to phenolphthalein He also suggests that other tissues besides the skin may become sensitized accounting for the general reactions that develop —E W ABRAMOWITZ *Arch Dermatol Syphilol* 31 (1935), 777, through *Squibb Abstr Bull* 8 (1935), A-974

Refrigerating Agents—Toxicity of the Newer Air conditioning apparatus is generally of the water injection type, and as the water comes into direct contact with the air that it cools, it is important that it be not contaminated through leaks by the cooling gases The new cooling agents (ethyl chloride, dichloroethylene, dichloromethane) are less toxic than carbon dioxide, ammonia or sulphur dioxide, but all cooling agents are injurious to the human organism when they modify the composition of the atmosphere Fluorine compounds (CF_2Cl_2 , CFCl_3 , CF_3Cl , etc) recently proposed in America are not without drawbacks Efforts should therefore be directed along the lines of improvement of the apparatus to render practically impossible contamination of the cooling water or of the cooled atmosphere —R LANDSBERG *Rev Gen Froid*, 15 (1934), 239-241, through *Chimie & Industrie* 33 (1935), 1111 (A P C)

Toxicity—Relation of, to Mode of Administration After the injection of 15.5 cc procaine (scurocaine) (I) solution containing 0.00012 Gm epinephrine (adrenaline) per 3 cc or a total of 750 mg I, into the exposed femoral artery of a 13 Kg dog the dog showed an intense excitation for 10 minutes The injected foot was used awkwardly, but was not paralyzed and the animal was completely normal on the following day A month afterwards, the same dog, though considerably weakened from other experiments, was given 700 mg I intravenously in the same leg as previously injected Respiration became slow and deep and after 5-6 movements ceased entirely and the heart stopped beating With the intravenous injection 0.25-0.5 cc "soluprotin" the phenomenon of intense shock was obtained regularly, but the injection of 1 cc into the artery was followed by some local reactions but no indication of a general reaction Similarly the injection into the artery of 20 cc acetylcholine, 1 mg epinephrine (adrenaline), 1 ampul of cobra toxin amounts which could not be injected intravenously, gave only varied local reactions Up to 5 cc of the compound (sommifen) of 5 allyl 5-isopropyl barbituric acid with 5.5 diethyl barbituric acid diethylamine had to be injected into the femoral artery to obtain a simple quieting effect although general anesthesia was obtained with 3 cc intravenously On the other hand the injection into the femoral artery of the sodium salt of 5 cyclohexenyl-1.5 dimethylbarbituric acid (sodium evipal) produced almost the same anesthesia as the intravenous injection The author suggests that the injection of some of these substances into the arteries may be characterized by a loss of toxicity without a loss of the desirable effects —P GOINARD *Compt rend soc biol*, 118 (1935), 689, through *Squibb Abstr Bull*, 8 (1935), A 631

THERAPEUTICS

8-Aminoquinoline—Derivatives of, as Antimalarials IV Compounds referable to the formula



were prepared, where N is represented by 6, 7, 9 and 11, respectively. The therapeutic indices of the compounds were, in the order given 13.3, 33.3, 40 and 5. Homologs containing an uneven number of methylene groups in the side-chain were more active and had a higher index than those possessing an even number of such groups. The relatively high index of 40 in the case of the nine carbon side-chain was occasioned chiefly by the low toxicity of the compound. The preparation of the greater number of compounds was based upon the use of α - ω -glycols. By use of the di-bromide and the bromido acetate, the corresponding α -diethylaminoalkyl acetates were obtained. Heating the latter with hydrobromic or hydrochloric acid gave the diethylaminoalkyl bromide or chloride which was then condensed with 8-amino-6-methoxyquinoline. The stabilities of the compounds increased with the length of the side-chain. Diethylaminopentyl chloride undergoes cyclization upon distillation, the higher homologs with less ease after three to four months standing.—O. J. MAJIDSON, O. S. MADAJEWA and M. W. RUBZOW. *Arch. Pharm.* 273 (1935) 320 (L. L. M.)

Amyl Nitrite—Use of, in Cases of Contraction Ring. A paper describing the use of amyl nitrite during labor in the rare condition in which a ring of persistently contracted muscle occurs in the body of the uterus, and prevents the delivery of the child. Amyl nitrite when administered causes relaxation of this ring. The author has tested the effect of amyl nitrite upon isolated strips of human uterus suspended in a bath, but he did not observe much effect.—C. R. CROFT. *Proc. Roy. Soc. Med.*, 28 (1935), 481, through *Quart. J. Pharm. Pharmacol.*, 8 (1935), 303 (S. W. G.)

Antipyretics. Antipyretics should only be sold on a physician's order and recognized as palliatives until the irritating cause is removed. Acetylsalicylic acid (I), the least dangerous of the drugs, might be excepted from such restriction. Acetanilide (II) so loudly declaimed as a cause of cardiac weakness and excluded from the B. P. and Canadian Formulary is undoubtedly efficient and perhaps not more dangerous than 1,5-dimethyl-4-dimethylamino-2-phenyl-3-pyrazalone (III, amidopyrine) which has replaced it as the official drug. *p*-Aceto-phenetide (IV, phenacetin) is not so dangerous and 1,5-dimethyl-2-phenyl-3-pyrazalone (V, antipyrine, phenazone) is credited as being even less harmful. I is much less dangerous but also much less efficient. 2-Phenyl-4-quinolinecarboxylic acid (VI, cinchophen) decreases fever and pain of acute articular rheumatism and like the others, may relieve pain of chronic lesions in muscles and joints, but its use should be carefully controlled. The evidence of the use of combinations of antipyretics with sodium bicarbonate or other alkali or caffeine is drawn largely from the use of relatively acute toxic doses. Sodium bicarbonate does however protect I in the stomach and its use is a little more credible than caffeine. The synergistic effects of combinations of III and barbiturates or IV and diethylbarbituric acid (VII) have been reported. Many cases of agranulocytic leucopenia have resulted from the use of III-barbiturate combinations. The IV-VII combination might be more extensively tested. Codeine (VIII) has compared with morphine little value in relieving pain yet appears to be effective in certain headaches. Clinical experience seems to justify the combination of VIII with antipyretics. The combination IV-VII-VIII may frequently replace morphine.—V. F. HENDERSON. *Can. Med. Assoc. J.* 33 (1935), through *Squibb Abstr. Bull.*, 8 (1935) A 989.

PHARMACEUTICAL ABSTRACTS

EDITOR A G DuMEZ, 32 S Greene Street, Baltimore, Maryland

ABSTRACTORS

WILLIAM B BAKER	ROLAND E KREMER
GERSTON BRUCH	CLIFFORD S LEONARD
ARTHUR H BRYAN	L LAVAN MANCHEY
HENRY M BURLAGE	ARTHUR E MEYER
ALBERT H CLARK	A PAPINEAU-COUTURE
ZADA M COOPER	W ARTHUR PURDUM
GUSTAV C COWALINA	HARRY ROSEN
AMELIA DeDOMINICIS	A S SCHWARTZMAN
MELVIN F W DUNKER	EMANUEL V SHULMAN
GEORGE W FIERO	EDGAR B STARKEY
PERRY A FOOTE	MARVIN R THOMPSON
RALPH R FORAN	E G VANDEN BOSCHE
SAMUEL W GOLDSTEIN	GLENN S WEILAND
H B HAAG	ANNA E WHITE
G W HARGREAVES	ELMER H WIRTH
WILLIAM H HUNT	THOMAS G WRIGHT
CASIMER T ICHNIOWSKI	MAX M ZERVITZ

CONTENTS

New Remedies	
Synthetics	254
Specialties	254
Bacteriology	268
Botany	273
Chemistry	
General and Physical	274
Inorganic	274
Organic	
Alkaloids	275
Essential Oils and Related Products	278
Fixed Oils Fats and Waxes	280
Glycosides Ferments and Carbohydrates	282
Other Plant Principles	284
Unclassified	286
Biochemistry	289

NEW REMEDIES

SYNTHETICS

Atabrin (Winthrop Chemical Co, Inc New York, N Y) is the dihydrochloride of met'hyloxychlor diethyl aminopentyl amino-acridine. It is also known as chinacrin. It is claimed to be an efficient and satisfactory agent for the treatment of malaria, destroying sexual and asexual parasites of tertian and quartan malaria and the asexual forms of tropical malaria. It is marketed in tubes of 15, 0.1 Gm tablets—*Am Drug* (Mar 1935), 106 (T G W)

Prostigmin (Hoffmann-La Roche, Inc Nutley, N J) is a 0.5% aqueous solution of the dimethyl carbamic ester of meta-oxyphenyl trimethylammonium methyl sulphate, a parasympathetic stimulant resembling physostigmine. It shows a pronounced action on peristalsis but at the same time the less pronounced miotic influence and almost complete absence of cardiac and vasomotor effects. It is administered hypodermically or intramuscularly for post operative gas pains, for intestinal atony and for the severe constipation of the bed ridden and other chronic cases. It should not be used with asthmatics. It is marketed in cartons of 12 and 50 1.1 cc ampuls—*Am Drug* (Feb 1935), 110 (T G W)

SPECIALTIES

A P L (Ayerst, McKenna and Harrison Ltd, Rouses Point, N Y) is a preparation of the hormone of the placenta, prepared and biologically standardized in accordance with the technique of Dr Collip of McGill University. It is a specific stimulant which when administered subcutaneously and intramuscularly will increase the endocrine activity of the ovary. Its use is indicated in uterine hemorrhage, in mastalgia and in the secondary type of amenorrhea. It is not intended for intravenous use. It is available in the form of a sterile standardized solution containing 100 biological day units (Collip) per cc. It is marketed in boxes of 6, 1 cc ampuls and in 5 cc and 10 cc rubber stoppered bottles—*Am Drug* (May 1935), 108 (T G W)

Absorbent Medicine for Internal Use. An intestinal absorbent medicine is prepared by dispersing kaolin of colloidal fineness in an aqueous dispersion of an inorganic hydroxide gel, e.g. aluminum hydroxide, ferric hydroxide—JOHN WYETH & BROTHER, Brit Pat 423,541 (Feb 4, 1935), through *Chem Abstr*, 29 (1935), 4523

Acecolex (Anglo-French Drug Co, Inc New York, N Y) contains acecoline (stabilized acetylcholine hydrochloride) 2 Gm, fenchone (terpenic ketone of camphor group) 10 Gm, ichthyol, 1.25 Gm, titanium oxide, 2 Gm, butyl para amino benzoate 1 Gm, zinc oxide, 10 Gm, excipient, q s ad, 100 Gm. It is claimed that recently formed and small varicose ulcers treated by this method usually heal and cicatrize within a week, older ulcers and those with edema and lymphangitis become clean and healthy in a week and cicatrize in a month. It is indicated in the treatment of varicose ulcer, atonic wounds and skin ulcerations in which there is a strong trophic factor. It is supplied as an ointment in 1 oz tubes—*Drug Circ*, 79 (June 1935), 70 (T G W)

Alomin (Eli Lilly & Co, Indianapolis, Ind) is a finely subdivided powder which goes readily into suspension in water and contains kaolin 24 Gm, aluminum hydroxide, 24 Gm, calcium carbonate, 16 Gm, bismuth subcarbonate, 16 Gm, sodium chloride 3 Gm, acacia 6 Gm, aromatics q s, dextrose, q s to make 100 Gm. It is claimed to neutralize mineral and organic acids, absorb toxins of bacterial origin, check excess secretions from mucous membranes, and allay irritation in the gastro intestinal tract. It is indicated in gastric hyperacidity and hypersecretion, useful in the presence of frank organic disease such as gastric or duodenal ulcer, also in certain cases of dysentery and diarrhea. It is marketed in 4 oz and 1-lb jars—*Drug Circ* 79 (July 1935), 62 (T G W)

Aminogen (Christina Laboratories, New York, N Y) is a preparation containing the submolecular immunologic determinants of the protein molecule complex. Its use is recommended in the treatment of gastro duodenal ulcers and for the abolition of muscular spasms, of the angioedema and hyperemia and for increasing the quantity of anti pepsin and proenzymes in the blood. It is administered by intramuscular injection. It is supplied in packages containing 12, 24 and 100 2 cc ampuls—*Am Drug* (Jan 1935), 108 (T G W)

Androcalcion H (Laboratories Cortial, Paris) are found on the market as yellow colored tablets, each tablet containing 0.15 Gm calcium lactate, 0.05 Gm magnesium glycerophosphate

0.05 Gm theobromine, 0.02 Gm Testes pulv, and 0.02 Gm Iodaseptinum Androcalcion E is found on the market in blue colored tablets, each tablet containing 0.2 Gm calcium lactate, 0.02 Gm magnesium glycerophosphate, 0.01 Gm iodomethyl hexamethylenetetramine, 0.02 Gm Testes pulv, and 0.02 Hypophysis Lobus anterior—*Pharm Weekblad*, 72 (1935), 752

(E H W)

Antagasan (Behring works) is a lactic acid bacterial preparation used for diseases caused by bacterial infection. The lactic acid bacteria present in the preparation biologically prevent the growth of pathogenic bacteria. Antagasan has no toxic properties and also exhibits no harmful effect on the tissues. The preparation works by lessening secretion and causing the disappearance of the pathogenic germs. It is used in surgery in catarrhal ulceration of the mucous membrane, in wounds, as an irrigant in cystitis, in otitis and laryngology, in inflammation of the middle ear, etc. It is applied in tampons and gauze bandages which are changed every 24 hours. It is found on the market in bottles of 20 and 100 Gm—*Pharm Weekblad*, 72 (1935) 824

(E H W)

Anterior Pituitary Extract (E. R. Squibb & Sons New York, N. Y.) is an alkaline aqueous extract of the anterior pituitary glands of cattle, and containing the thyrotropic and sex stimulating factors of the anterior pituitary gland. It is administered intramuscularly. It is used for pituitary types of dwarfism and Simmond's disease. It is supplied in 10 cc vials containing 100 growth units—*Drug Circ*, 79 (June 1935), 25

(T G W)

Antutrin-S (Parke, Davis & Co., Detroit Mich.) is the sex hormone of the anterior pituitary as obtained from the urine of pregnancy. It is a standardized product representing in each cc, 100 rat units. It stimulates ovarian function notably the development of the corpora lutea. Its use is indicated in metrorrhagia, menorrhagia, uterine bleeding, retarded sex development and amenorrhea. It is supplied in the form of a hypodermic solution in 10 cc rubber capped vials—*Am Drug* (Apr 1935) 108

(T G W)

Arsaceticum According to the *Schweiz Apoth Zeitung* (1935), 204, the original *Arsaceline* is no longer produced by I. G. Farben. If the product is called for under this name one should dispense sodium acetylarsanilicum, meeting the requirements of the Pharmacopœia—*Pharm Weekblad* 72 (1935) 752

(E H W)

B. R. I. Colloid (Anglo French Drug Co., Inc., New York, N. Y.) is a lead selenide colloid that has been investigated experimentally and clinically at the Bristol (England) Royal Infirmary and found to be of value in operable carcinoma. It is also called "D.S." It is administered intravenously in 5 to 10-cc doses at weekly intervals during 8 to 12 weeks. The maximum dose is 15 cc. It is supplied in 5, 10- and 15-cc ampuls—*Am Drug* (Mar 1935), 106

(T G W)

Baldronit (Otto Reichel, Fabrik pharm u biol Erzeugnisse Berlin-Neukölln) is a sedative and hypnotic. It is an extract of 80% *Valeriana montana* and 5% *Adonis vernalis* with 12.5% of ethyl allyl barbituric acid with amidopyrine. It is useful in cardiac neurosis, neurasthenia and hypertension—*Deut Med Wochschr* 61 (1935), 1002

(H R)

Biocholine (Anglo French Drug Co., New York, N. Y.) is a physiologically tested solution of choline hydrochloride, entirely free from mono- and diethylamines. It possesses the property of rebuilding the cholesterol molecule and increasing the cholesterol content of the blood. Its use is indicated in active tuberculosis, both pulmonary and extra pulmonary. It should not be used in those diseases (e.g. diabetes) where there is already an excess of cholesterol in the blood. It is supplied in boxes of 25, 50 and 100, 1-cc ampuls (0.02 Gm of choline hydrochloride per ampul)—*Am Drug* (Apr 1935), 108

(T G W)

Biseptol (The Maltbie Chemical Co., Newark, N. J.) is a light soft, antiseptic powder containing bismuth salts, boric acid, thymol iodide, alum, menthol and other ingredients in a base of fine talcum. It is easily wetted by serous exudates. It is used as a dry surgical dressing for the treatment of skin abrasions and skin infections, and is marked in 1-oz. sprinkler top cans—*Drug Circ*, 79 (June 1935), 70

(T G W)

Bismo-Kaolin (Flint Eaton & Co., Decatur Ill.) is a white creamy liquid containing in each fluidounce 40 grains each of bismuth subcarbonate and kaolin in colloidal suspension. It contains no cathartics or oil, no sugar or alcohol. It is marketed in 4- and 16 oz. bottles—*Am Drug* (Mar 1935) 106

(T G W)

Bismurung is an ointment consisting of bismuth oxychloride in colloidal dispersion in an emollient base. It is recommended as an antiseptic ointment which is soothing and healing in any inflamed, irritated or painful condition of the skin. It is beneficial in all forms of dermatitis.

pruritus, eczema and many other conditions Bismurung is supplied in 1 oz and 2 oz tins—*Quart J Pharm Pharmacol*, 8 (1935), 317 (S W G)

Bokanol (Chatelain's Laboratories, Paris, George J Wallau, New York, N Y Dist) is a preparation containing in each case 3 cc dose 0 001 Gm of colloidal iron, 0 150 Gm of sodium glycerophosphate, 0 060 Gm of sodium cacodylate and 0 0015 Gm of strychnine cacodylate The solution is dispensed in a 3-cc ampul and is recommended in the treatment of neurasthenia chlorosis and anemia—*Am Drug* (Feb 1935), 108 (T G W)

Bromostronturan, sodium bromide strontium chloride-urea, is supplied as an intravenous or intramuscular injection, and as tablets for oral administration, for the treatment of itching dermatoses It is recommended for the treatment of acute and chronic eczema, urticaria, purpura, neurodermatitis and other forms of dermatitis The dose in severe cases should be one 10 cc ampul injected intravenously every day In less severe cases 5 cc injected four times a week will be sufficient Bromostronturan tablets should be given 2 or 3 times daily to supplement the injections in severe cases, but may be given alone in milder cases The 10 cc ampuls are issued in boxes containing 1, 3 and 8 ampuls The 5 cc ampuls are supplied in boxes of 2 and 8 Bromostronturan tablets are issued in packages of 25 and 100—*Quart J Pharm Pharmacol*, 8 (1935), 317 (S W G)

Cal-B (The Calco Chemical Co, Inc, Bound Brook N J) is a mixture of wheat germ vitamin B and calcium gluconate It is used for the relief of calcium deficiency and the tonic effect of vitamin B It should be given only on the advice of a physician It is marketed in bottles of 4 oz—*Drug Circ*, 79 (July 1935), 60 (T G W)

Calcidex (Intravenous Products Inc, New York N Y) is a solution of colloidal calcium combined with pure dextrose Each 10 cc of the solution represents the equivalent of 6 grains of calcium hydroxide or 10 grains of calcium chloride It is administered intravenously or intramuscularly for conditions associated with calcium deficiency, such as tuberculosis bronchial asthma, bronchitis or hay-fever It is marketed in packages of 6, 25 and 100, 10 cc ampuls—*Am Drug* (Feb 1935), 110 (T G W)

Calcinate (Carroll Dunham Smith Pharmacal Co Orange, N J) are ampuls containing 0 09 Gm of calcium It is a sterile aqueous solution, less painful than calcium chloride and is tolerated to about twice the quantity It contains 13 1% calcium or nearly 50% more calcium than calcium levulnate It is administered intravenously or intramuscularly It is indicated in calcium deficiencies It is supplied in ampuls of 5 and 10 cc in boxes of 6, 25 and 100—*Drug Circ*, 79 (July 1935), 60 (T G W)

Calcio-coramine (Gesellschaft fur chemische Industrie, Basel) is a well crystallized double salt of pyridine β carbonic acid diethylamide (coramine) and calcium rhodanate It is soluble in water and has been shown by experiments on rabbits to be only slightly toxic The circulatory and respiratory stimulant action of the coramine is increased by the calcium rhodanate especially as far as the heart action is concerned Calcio coramine is found on the market in 400 mg tablets Dose 1-2 tablets three times a day—*Pharm Weekblad*, 72 (1935), 824 (E H W)

Calcium "Eci" (Electrochemische Industrie, Ltd, Roermond) is a calcium gluconate ($C_6H_{11}O_7$)₂Ca, in powdered form *Pharm Weekblad*, 71 (1935), 825 (E H W)

Calogran (Flint, Eaton & Co, Decatur, Ill) is a granular effervescent form of calcium gluconate It contains 50% of the gluconate It is designed for real calcium therapy affording easy solubility and adequate dosage It is indicated in all cases where calcium is indicated, such as edema, inflammatory conditions, exudative diathesis and weeping eczema It is supplied in 5-oz bottles—*Am Drug* (Apr 1935), 108 (T G W)

Canfidrol-Solution, Canfidrol-Ampuls (Laborat Farmacol Reggiano, Correggio, Italy) contain calcium camphosulphonate and ephedrine hydrochloride put up in containers of 15 cc and in packages of 6 ampuls, 1 cc each and 3 ampuls, 5 cc each—*Pharm Presse* 40 (1935), 279 (M F W D)

Carmacin "Tabloid" (Burroughs Wellcome & Co, Inc New York N Y) contain calcium carbonate, grains 12 magnesium carbonate grains 8, sugar, grains 8, oil of peppermint, q s The antacid effect of calcium carbonate is augmented by that of magnesium carbonate which also acts as a mild saline purgative, alkalizes the urine, and is a mild diuretic It is suitable for treatment of hyperacidity dyspepsia and heartburn The antacid properties render it useful in acute

gastric catarrh, acute gastro enteritis and gastric ulcer It is supplied in glass tubes of 25 products—*Drug Circ*, 79 (June 1935), 70 (T G W)

Caspetol (E R Squibb & Sons, New York, N Y) is a palatable combination of Squibb's tasteless castor oil with 15% of a special light mineral oil with 3% of alcohol It is marketed in 3-oz bottles—*Am Drug* (May 1935), 108 (T G W)

Cavodol tablets contain a cod liver oil concentrate with a potency of 1000 vitamin A and 500 vitamin D units, reduced iron colloidal copper, calcium iodide, berberine sulphate and extract of gentian They are recommended for the treatment of avitaminosis and anemia The adult dose is 1 to 2 tablets three times daily with water or milk Children can be given half of the adult dose Two tablets are equivalent to 1 tablespoonful of cod liver oil The tablets are supplied in bottles of 100—*Quart J Pharm Pharmacol*, 8 (1935), 318 (S W G)

Ceanothyn (Flint, Eaton & Co, Decatur, Ill) is a hydroalcoholic extract of the bark of the root of *Ceanothus americanus* containing the alkaloids of this drug in uniform solution The preparation is claimed to be a reliable hemostatic, applicable to conditions of actual bleeding largely restricted to hemostasis where capillaries are involved It is administered orally and is well adapted to routine prophylactic use in minor surgical procedure in throat and nose operations in oral surgery and in urological and gynecological work It is marketed in 1-pint bottles—*Am Drug* (May 1935), 108 (T G W)

Choloton for Injection (Chemisch Fabrik Promonta G m b H, Hamburg 26) is a solution of albumin-free liver extract, extrahepatic bile duct and bile It is supplied in ampuls and is used in liver and bile duct diseases—*Deut Med Wochschr*, 61 (1935) 1002 (H R)

Chondrocein (Christina Laboratories New York, N Y) is a cartilaginous extract consisting chiefly of purified and chemically controlled scleroproteins extremely rich in disulphide and sulphhydryl groups The administration of these sulphur compounds has found a great value in the treatment of all forms of arthritis, sciatica, neuralgia and neuritis In addition to the disulphide and sulphhydryl groups it contains scleroproteins which act as nonanaphylactic and non specific agents, thereby stimulating cellular activity and leucocytosis It is dispensed in the form of a sterile solution designed for intramuscular injection It is marketed in packages of 12, 24 and 100, 2 cc ampuls—*Am Drug* (Feb 1935), 106 (T G W)

Chromosmon (Curta & Co) is a dark blue liquid marketed in ampuls of 10 cc It is a solution of methylene blue and glucose and is used in all cases of gas poisoning, as prussic acid carbon monoxide, illuminating gas, etc—*Pharm Weekblad*, 72 (1935), 825 (E H W)

Citrofinal is a new name for the sodium chloride free kitchen salt *Citrovin* manufactured by Chem Fabrik Bad Homburg and recommended for use in salt-free diets—*Pharm Weekblad* 72 (1935) 752 (E H W)

Collosol Calcium (Crookes Laboratories, Inc, New York N Y) is an 0.85% aqueous colloidal suspension of calcium oleate (representing 0.05% of metallic calcium) designed as an effective agent in calcium therapy Its use is indicated in the treatment of tuberculosis especially when combined with iodine treatment It has also been found of value in the control of hemorrhage (ante and post operative) as a prophylactic in hay-fever and in the treatment of pelvic pains in women It is administered intramuscularly intravenously or orally It is marketed in boxes of 6, 0.5 and 1-cc ampuls, in 30 cc rubber-capped bottles, and in 8 and 16 oz bottles—*Am Drug* (Feb 1935), 108 (T G W)

Collosol Iodine (Crookes Laboratories, Inc, New York, N Y) is a loose colloidal combination of hydroiodic acid and protein suitable for administration either by the oral, subcutaneous or intravenous route It is offered in oleaginous and in aqueous solution and also in ointment form Collosol Iodine Oil may be rubbed into the skin without staining it is non-irritating and is non-coagulative of tissues and it rapidly penetrates the tissues Collosol Iodine Aqueous produces slow elimination of iodine and affords minimum danger of iodism The oil is used by local absorption in localized rheumatoid arthritis and for enlarged glands and goiter It is also used in the treatments of skin diseases, such as eczema, chilblains and ringworm of the scalp The aqueous solution is used orally in arthritis and goiter and as a spray in catarrhal conditions When injected subcutaneously, intramuscularly or intravenously it is of value in syphilis and in rheumatism Collosol Iodine Oil is dispensed in 1-, 4-, 8 and 16 oz bottles The aqueous solution (0.2% iodine) is dispensed in 4-, 8, 16 and 80 oz bottles The isotonic intravenous fluid (0.2% iodine) is dispensed in 10-cc ampuls (6 to the package) and also in 4 oz bottles The intramuscular or sub

cutaneous fluid (1% iodine) is supplied in 1-cc ampuls and in 1 oz bottles—*Am Drug* (June 1935), 110 (T G W)

Cortical-Liquid, Cortical-Ampuls (Istituto Opoterapico Pisa) contain the aqueous total extract of the fresh cortex of the suprarenal glands, put up in containers of 40 cc and in packages of 6 ampuls, 2 cc each—*Pharm Presse* 40 (1935), 279 (M F W D)

Cratægol Tablets (Carroll Dunham Smith Pharmacal Co, New York N Y) are orange colored sugar-coated tablets each containing 2 minims of cratægus compound, 1 minim of fluid extract of apocynum, 1 grain of sodium nitrite, $\frac{1}{100}$ grain of gold and sodium chloride and $\frac{1}{100}$ grain of nitroglycerin. These tablets are indicated in high blood pressure with its attendant vertigo, nasal hemorrhage flushed red hot skin and cardiacal complications. They are marketed in packages of 1 000 and 5 000—*Am Drug* (Mar 1935), 106 (T G W)

Crystal Violet Jelly (Calco Chemical Co Bound Brook N J) is a 1% jelly of crystal violet in a water-soluble tragacanth base. It has been found to be a valuable agent in the treatment of burns. It is marketed in 4 oz and 1-lb glass jars—*Am Drug* (July 1935), 76 (T G W)

Cyclobis (Winthrop Chemical Co, Inc, New York, N Y) is composed of bismuth camphenilate, an organic bismuth compound containing 30% of bismuth. It is insoluble in water but gives a clear solution in oil, it is well tolerated, relatively non toxic and does not produce tissue irritation at the site of the injection. It is administered intramuscularly only generally given in courses, alternating with the arsenicals. It is indicated in all stages of syphilis and is well adapted for the treatment of congenital syphilis used in conjunction with the arsenicals. It is supplied in boxes of five 2 cc ampuls of the 10% oily solution—*Drug Circ*, 79 (July 1935) 29 (T G W)

Cysteine Hydrochloride (E R Squibb & Sons, New York N Y) is a preparation of the hydrochloride of the sulphhydryl compound cysteine, $\text{CH}(\text{COOH})(\text{NH})\text{CHSH}$, buffered with sodium borate, so as to produce a 0.5% solution having the p_{H} 4.0. It is recommended as a wet dressing for wounds stimulating granulation and epithelial proliferation. It is marketed in 0.5 and 5.0 Gm ampuls in packages of five—*Am Drug* (Feb 1935), 108 (T G W)

Dermo-Stop-Tablets (Fa Brady and Schmidgall Vienna, 12th dist) contain in each tablet 0.50 Gm basic calcium aluminum tannate in chocolate, 2 in a package—*Pharm Presse*, 40 (1935) 279 (M F W D)

Deriphyllin Oral (Chemisch Pharmazeutische A G Bad Homburg Frankfurt a M) is a solution of theophylline oxyamine containing 0.412 Gm per cc. It is used as a diuretic and cardiac tonic—*Deut Med Wochschr* 61 (1935) 1002 (H R)

Dermabella Skin Oil (Fabrik fur pharm Spezialitäten, Homöopathie und Biochemie G A Reinecke, Hannover) a virgin cold pressed olive oil perfumed with natural products is used for sunburn body and skin care and as a massage oil—*Pharm Zentralh* 76 (1935), 380 (E V S)

Devegan (Winthrop Chemical Co, Inc, New York, N Y) Tablets containing acetylaminohydroxyphenylarsonic acid, a small amount of boric acid, and a substance obtained by subjecting carbohydrates to a partial transformation by mild oxidation and hydrolysis. A destructive agent against the flagellate and cystic forms of *Trichomonas*. It furnishes a culture medium for the lactobacilli normally present in the vagina and reestablishes the normal vaginal flora and thereby aids in preventing infection by foreign organisms. It is indicated in the treatment of *Trichomonas vaginitis* and of leukorrhea due to mixed and non specific bacterial infections. It is issued in boxes of 25 tablets—*Drug Circ* 79 (June 1935) 25 (T G W)

Dibroluur (Society for Chemical Industry, Katwijk, Netherlands) is bromdiethylacetylurea—*Pharm Weekblad* 72 (1935) 825 (E H W)

Dicalcium Phosphate with Viosterol (E R Squibb & Sons, New York N Y) is the trade name for tablets each of which contains 9 grains of dicalcium phosphate 6 grains of calcium gluconate and viosterol (Squibb) of the potency of 660 vitamin D units (1934 standard). The calcium phosphorus ratio is 1.625. Its use is indicated in the treatment of mild rickets in supplying calcium during pregnancy and lactation and in other conditions where calcium therapy is desirable. It is supplied in bottles of 50 tablets—*Am Drug* (Apr 1935), 108 (T G W)

Diffundol (Diffundol G m b H Frankfurt a M) is an ointment containing soda salt ointment, ethereal oil rectified oil of turpentine sulphur compounds and Formoxyl hydrate. It is used as an antirheumatic—*Deut Med Wochschr* 61 (1935) 1002 (H R)

Dinitrenal Capsules (Drug Products Co., Inc., Long Island City, N. Y.) are capsules each containing alpha dinitro phenol sodium (100 mg.), suprarenal and charcoal. It is claimed to be a metabolic stimulant which accomplishes controlled reduction in weight, if not due to lack of thyroid secretion. It is used in the treatment of obesity and should only be used under the supervision of a physician. It is issued in bottles of 20 and 100 capsules—*Am Drug* (Jan 1935), 108

(T G W)

Diotrast is the name applied in the United States to the substance known in Europe as *Per abrodil* (*Quart J Pharm Pharmacol* 5 (1932) 753). It is 3,5-diiodo-4-pyridone N-acetate of diethanolamine, and is used as a urographic contrast agent. It is a white odorless powder containing 51.8% of iodine, m.p. 246-247° C. It is supplied in 20 cc ampuls containing a 35% solution, the dose intended for an adult, but it can safely be given to young children without toxic effects—*Quart J Pharm Pharmacol*, 8 (1935), 318

(S W G)

Diplosal (C. F. Boehrung & Sons) is now produced as an ointment procurable in tubes and containing 5% diplosal. The diplosal is dissolved in oil and then worked up with other fatty constituents, the preparation being used in cases of muscular rheumatism to augment the internal therapy—*Pharm Weekblad*, 72 (1935) 752

(E H W)

Dosarter is the trade name for "collampoules" containing colloidal arsenic sodium silicate, sodium iodide sodium salicylate, analgesin and thiosinamine. It is indicated in arteriosclerosis when it is administered hypodermically in 3 cc doses. It is supplied in 3 cc ampuls—*Am Drug* (Mar 1935) 106

(T G W)

Drug Specialties and Nostrums—Certain, in Tea Form. The composition of some fourteen different tea mixtures expressed in proportionate relationship of the herbal constituents is given—W. PEYER *Süddeut Apoth.-Ztg*, 75 (1935), 321, through *Chem Abstr*, 29 (1935), 4519

Embrodex contains phenylethyl iodide 1% undecylenic iodide 0.2% incorporated in a non-greasy emollient base, for external application. It is suggested for the treatment of rheumatism, sciatica, arthritis, chilblains, sprains, as a chest rub in bronchitis and as an antiseptic dressing for wounds and ulcers. The absorption of embrodex causes hyperemia relieving congestion, and with the analgesic action of phenylethyl iodide gives relief from pain. Embrodex is applied 3 or 4 times daily to the affected part and rubbed gently until absorbed. It is supplied in small and large collapsible tubes in 1 lb tins, and in larger packings for hospitals—*Quart J Pharm Pharmacol*, 8 (1935) 318

(S W G)

Emmenin Liquid (Ayerst McKenna and Harrison Ltd., Montreal, Canada and Rouses Point, N. Y.) is an alcohol soluble, ether insoluble placental hormone prepared and biologically standardized by the technique employed by Dr. Collip of McGill University. It supplements the oestrogenic activity of the hypo functioning ovary and is active when administered by mouth. It is recommended in dysmenorrhea, menstrual headache, menopausal symptoms, amenorrhea and in vomiting in pregnancy. It is marketed in 4 oz bottles—*Am Drug* (Apr 1935), 108

(T G W)

Endo-Mangalac (Endo Products, Inc., New York, N. Y.) is a standardized solution of endomanganese proteinate which is superior to regular milk injections. It is indicated in pelvic infections, in neuritis, in furunculosis and in various forms of acne. It is administered intramuscularly. It is marketed in packages of 12, 25 and 100 1 cc ampuls and in packages of 12, 25 and 100, 2 cc ampuls—*Am Drug* (Feb 1935), 106

(T G W)

Endothyryn (Harrower Laboratory, Inc., Glendale, Cal. and New York, N. Y.) is the trade name for a standardized thyroid that is triple the U. S. P. strength. Its iodine content is 0.6% and it is virtually non-toxic. It is indicated in all conditions where total thyroid is given and it does the same work as one third the usual dose. It is marketed in bottles of 50 0.5 grain tablets—*Am Drug* (Feb 1935) 108

(T G W)

Entacard (Reed and Carnrick, Jersey City, N. J.) is the trade name for enteric coated tablets each containing 5 grains of sodium bicarbonate, $\frac{1}{2}$ grain of calcium carbonate, $\frac{1}{4}$ grain of potassium bicarbonate and $\frac{1}{4}$ grain of magnesium carbonate. It is claimed to afford systemic alkalization without gastric disturbance and is therefore of value in nephritis, rheumatism, diarrhea and for other disorders conditioned upon a lowered alkalinity. It is marketed in metal boxes containing 75 tablets—*Am Drug* (June 1935) 110

(T G W)

Entoral (Eli Lilly & Co., Indianapolis, Ind.) Pulvules containing killed pneumococci 25,000 million *H. influenzae*, 5,000 million streptococci, 15,000 million, *M. catarrhalis* 5,000

million An immunizing antigen administered orally which will produce heterophile antibody in sufficient amounts to increase the resistance of individuals to respiratory infections One pulvule is given one hour before breakfast for seven successive mornings, thereafter, two pulvules taken each week throughout the season For children under six years of age, one half the adult dose is given It is supplied in bottles of 20 pulvules—*Drug Circ*, 79 (June 1935), 25 (T G W)

Epherheumine (Kon Pharm Fabrieken, Brocades-Stheeman & Pharmacia, Netherlands) is a combination of 500 mg acetylsalicylic acid and 15 mg ephedrine hydrochloride, in tablet form—*Pharm Weekblad*, 72 (1935), 752 (E H W)

Ephetonogen is a combination of ephedrine and adrenaline, containing in 1 cc 0.0001 Gm of adrenaline and 0.02 Gm of ephedrine It is indicated in diseases accompanied by bronchial spasm and in infectious toxic collapse The advantage claimed for this combination is that the necessary quantity of adrenaline is much reduced, and adrenaline intoxication is avoided In rhino laryngology it may be administered by painting or spraying, or as an inhalant The dose is 1 or 2 cc daily It is supplied in boxes of six 1 cc ampuls—*Quart J Pharm Pharmacol*, 8 (1935), 318 (S W G)

Estrogenic Hormone (Reed and Carnrick, Jersey City, N J) is prepared from prenatal urine in aqueous solution containing 500 rat units (approximately 1,500 international units) per cc and in oil solution containing 2,000 rats units (approximately 6,000 international units) per cc Also in oil solution of higher unitage The aqueous solution is administered by subcutaneous injection and the oil solution by intramuscular injection It is used for amenorrhoea and dysmenorrhoea associated with uterine hypoplasia, in menopausal disturbances, and certain cases of functional sterility It is supplied in the aqueous solution (500 rat units) in boxes of 1 and 6 1 cc ampuls and in the oil solution (2,000 rat units) in boxes of 1, 3 and 6 1 cc ampuls—*Drug Circ*, 79 (July 1935), 29 (T G W)

Ethacreo (Sharp & Dohme Philadelphia & Baltimore) is an elixir containing chloroform creosote, terpin hydrate calcium and sodium glycerophosphates It is claimed to possess expectorant tonic and mildly antiseptic action, identical in strength with Elixir Terpin Hydrate and Creosote, N F V but differs in color and in the basic elixir which is used to make it more palatable It is indicated in every type of cough, particularly obstinate coughs, also in the treatment of chronic coughs of long standing and in hoarseness It is issued in 1-pint and 1-gallon bottles—*Drug Circ*, 79 (July 1935), 28 (T G W)

Femivir (Anglo-French Drug Co., Inc., New York, N Y) is a pluriglandular extract combining the hormones of the female reproductive glands with a small quantity of yohimbine It is prepared from fresh glands and the extract is presented in the form of specially coated tablets which are easily absorbed It stimulates the dormant female reproductive glands and produces sexual desires and is therefore used in sexual frigidity, amenorrhoea and in sterility It is marketed in bottles of 50 and 300 tablets and also in boxes of 12 ampuls for subcutaneous injection—*Am Drug* (July 1935), 76 (T G W)

Ferrodic iron granules contain colloidal ferrous phosphate in combination with glucose and chocolate It is claimed that the iron remains in the ferrous condition indefinitely, and that it has a pleasant flavor free from the astringent taste of iron salts Suspensions in water give no reaction for ionized iron, but the iron is rapidly dissolved in hydrochloric acid as in the stomach and maximum absorption is ensured The granules are recommended for administration to children and to those liable to gastric disturbance following the use of other iron compounds A teaspoonful of ferrodic iron granules is equivalent in iron to 10 grains of Bland's pill, or 4 teaspoonfuls of Parry's chemical food The dose is half to two teaspoonfuls taken alone or on bread and butter, or in hot or cold milk Ferrodic iron granules are sold in 1/2 lb and 1 lb screw top tins—*Quart J Pharm Pharmacol*, 8 (1935), 318 (S W G)

Ferro-Salicylate (Wm S Merrell Co., Cincinnati, Ohio) contains in each fluidounce, 40 grains of natural sodium salicylate and 40 minims of tincture of ferric citrochloride in a palatable solution of ammonium citrate It is an anodyne, hematonic and tonic and does not induce gastric disturbances It is given in doses of one or two teaspoonfuls in water three or four times daily It is used for the treatment of rheumatic conditions anemias or debilitated conditions following prolonged illness, and in post-influenzal convalescence It is supplied in pint bottles—*Drug Circ*, 79 (June 1935), 68 (T G W)

Flavicrine (Christina Laboratories, New York, N Y) is a thiazonium derivative of diamino

alkyl acridine, a dye possessing high bacteriostatic activity. It possesses low toxicity as compared to ordinary acridine dyes, is more permeable to inflamed tissues and acts equally well in acid and in alkaline urine. It is used in the treatment of gonorrhea and in renal and genito urinary infections. It is administered intravenously in the form of a 2% solution. It is marketed in the form of a 2% solution in 5 cc ampuls (6, 24 and 100 to the package) —*Am Drug* (July 1935), 76 (T G W)

Gon A-Vee 16 (G H Sherman, M D, Inc., Detroit, Mich.) is a combined antiviral (A-Vee) made from the common organisms as found in gonorrhea of the male and female tracts, incorporated into a suitable bland innocuous semi-tenacious base. It is claimed to be capable of conferring local immunity to the area injected and of controlling the mixed Neisserian infections. Used as a local injection for acute gonorrhea of the male and female. Two cc is injected deep into the male urethra and 5 to 7 cc injected at least twice weekly into the cervical canal of the female. It is supplied in packages containing five 3/4 oz tubes, one 12 1/2 cc vial of *Gonococcus* combined vaccine and three semi flexible metal catheters —*Drug Circ*, 79 (June 1935), 24 (T G W)

Gynocalcium M (Laboratories Cortial, Paris) is found on the market in the form of purple-colored tablets, each tablet containing 0.25 Gm calcium lactate, 0.025 Gm magnesium lactate, 0.025 Gm *Testes pulv*, 0.125 Gm *Ovaria pulv*, and 0.05 Gm calcium lactophosphate —*Pharm Weekblad*, 72 (1935), 752 (E H W)

Gynocalcium P (Laboratories Cortial, Paris) is found on the market in red colored tablets each tablet containing 0.2 Gm calcium lactate, 0.025 Gm magnesium lactate, 0.02 Gm *Hypophys Lobus ant* and 0.05 Gm calcium lactophosphate. Both **Gynocalcium M** and **Gynocalcium P** are used for amenorrhoea and other disturbances —*Pharm Weekblad*, 72 (1935), 752 (E H W)

Hexa-Chloride Compound (Pitman Moore Co., Indianapolis, Ind.) is a urinary antiseptic, each fluidounce representing methenamine, 40 grains, ammonium chloride, 40 grains, tincture hyoscyamus, 40 minims, Zea mays, dry, 40 grains, triticum 80 grains, and aromatics. It is so prepared as to increase the acidity of the urine and hence secure the full antiseptic action of the methenamine. It is used in all conditions indicating the administration of methenamine, including many forms of cystitis, certain gonorrheal conditions and other urinary infections. It is supplied in pint bottles —*Drug Circ*, 79 (July 1935), 60 (T G W)

Hexylresorcinol Crystoids (Sharp & Dohme, Philadelphia & Baltimore) Each crystoid contains 0.2 Gm of crystalline hexylresorcinol, enclosed in a hard gelatin covering. It is used to control round worm (*Ascaris*) and hookworm (*Uncinaria*) infestations. It is marketed in packages of six vials, each vial containing five crystoids —*Drug Circ*, 79 (June 1935), 24 (T G W)

Hydronal (I G Farbenindustrie, Bayer) is colloidal aluminum hydroxide prepared by a special method and of such a grade that at 37° it allows a certain quantity of N/10 hydrochloric acid to remain in the gastric juice so as to allow the activity of pepsin to proceed undisturbed. Two-3 tablets are given before meals as a prophylactic and 1-2 tablets are taken after meals in hyperacidity. The tablets contain 0.5 Gm hydronal —*Pharm Weekblad*, 72 (1935), 825 (E H W)

Idracafine (J D Riedel Chemical Factory) is a mixture of 0.5 Gm Idragine (Acid acetylsalicylicum, Riedel) and 0.05 Gm caffeine in tablet form —*Pharm Weekblad*, 72 (1935) 752 (E H W)

Idragine is the name given by A G Riedel to acetyl salicylic acid manufactured by them —*Pharm Weekblad*, 72 (1935) 752 (E H W)

Injectable Liver Extract, Abbott (Abbott Laboratories, North Chicago, Ill.) contains in each cc an extract derived from 50 Gm of fresh, edible, mammalian liver by a process of fractionation and concentration which conserves the pernicious anemia factor. It is used for intramuscular injection in the treatment of pernicious anemia. It is issued in boxes of ten 1-cc vials —*Drug Circ* 79 (July 1935), 29 (T G W)

Iodaseptine (Laboratories Cortial, Paris) is a compound of benzomethylphenylester. It contains 42% iodine, is not toxic and does not give rise to local reactions. It is used in rheumatism, tuberculosis and arteriosclerosis. It is found on the market in 10% solution in ampuls and in tablets containing 0.2 and 0.5 Gm iodaseptine. Iodaseptine with salicyl contains 76 mg of sodium salicylate per cc. It is put up in ampuls of 5 and 10 cc —*Pharm Weekblad*, 72 (1935), 752 (E H W)

Iosicol (Factory for Chemical and Pharmaceutical Preparations of Pharmacist P Bolder Keulen Netherlands) is a solution of 2 Gm of potassium iodide in colloidal silicic acid solution. It is used in arteriosclerosis — *Pharm Weekblad*, 72 (1935), 753 (E H W)

Jectovin (McKesson & Robbins, Inc., Bridgeport Conn.) is a sterile neutral solution of vitamin A (100 000 units per cc., U S P X 1934 Revised) and vitamin D (12,500 units per cc., U S P X 1934 Revised) in sesame oil. It is rapidly absorbed when periodically injected intramuscularly in the gluteal regions. The dose is $\frac{1}{2}$ to 1 cc weekly or semi monthly. It is indicated in pregnancy, rickets, tuberculosis and in all cases of depletion of vitamin reserve as in chronic ailments or because of severe regulated dietaries. It is especially adaptable in conjunction with calcium and phosphorus therapy in the treatment of fractures with delayed knitting. It is supplied in vials of 5 cc — *Drug Circ*, 79 (July 1935), 28 (T G W)

Kataline (Society for Chemical Industry, Katwijk Netherlands) contains phenacetine dimethylamidoantipyrine, caffeine, quinine sulphate and is sold in tablets containing 350 mg of the mixture — *Pharm Weekblad*, 72 (1935), 825 (E H W)

KLX tablets contain in each herba capsellæ 0.05 Gm, cortex cinnamomi 0.05 Gm, folia matico 0.05 Gm, *Valeriana officinalis* 0.05 Gm, potassium iodide 0.3 Gm. They are recommended for the treatment of functional cases of menorrhagia and dysmenorrhœa. In ordinary cases one tablet taken three times daily for three days will be sufficient, but in severe cases the dose can be increased to 4 tablets — *Quart J Pharm Pharmacol*, 8 (1935), 319 (S W G)

Kolag (Kolag Co., New York, N Y) contains colloidal kaolin, finely powdered agar, sodium sulphocarbonate, lactose and aromatics. It is indicated in the treatment of colitis and allied intestinal disfunctions, its tendency is to produce normal bowel movement without catharsis, the emulsion form has the added lubricative powers of mineral oil. It is supplied as plain or alkaline powder in 4 oz, 8 oz and 24 oz sizes and in the emulsion form in pints — *Drug Circ* 79 (June 1935) 70 (T G W)

Lactozym Alfa (Bacteriological and Therapeutic Laboratory of Prof J Mezzodroli, Bologna) is the normal lactic acid forming proteolytic ferment of the stomach and intestines dispensed in potable form in ampuls — *Pharm Weekblad* 72 (1935), 753 (E H W)

Liviron (Christina Laboratories New York N Y) is a concentrated liver extract with iron. It is a sterile aqueous solution containing a nitrogenous non protein fraction G which Cohn, Minot and Murphy obtained from fresh mammalian liver. Each cc of the solution represents approximately 33 Gm of whole fresh liver, plus 4 mg of physiologically active ferrous iron. It is employed intramuscularly in the treatment of pernicious and secondary anemia. It is supplied in packages of 12, 24 and 100 1 cc ampuls — *Am Drug* (Mar 1935), 106 (T G W)

Luteal Ampuls (Istituto Opoterapico, Pisa) contain the aqueous total extract of the corpus luteum, sold in packages of 6 ampuls 1 cc each — *Pharm Presse*, 40 (1935) 278 (M F W D)

Magganon Asthma Powder (A G fur medizinische Producte, Berlin N65) contains the alkaloids of ephedra, aristolochia and aspidosperma, potassium iodide, and antipyrines. It is used for bronchial and cardiac asthmas — *Pharm Zentralh* 76 (1935) 353 (E V S)

Mastal-Liquid, Mastal-Ampuls (Istituto Opoterapico Pisa) are the aqueous total extract of fresh mammary glands put up in 60 cc containers and in packages of 12 ampuls 2 cc each — *Pharm Presse* 40 (1935) 279 (M F W D)

Merphenyl (Hamilton Laboratories, Inc. Hamilton Ohio) is the trade name for a series of preparations containing basic phenylmercuric nitrate. These preparations afford new and effective agents for the control of pathogenic bacteria, fungi and yeast. The Merphenyl preparations include *Merphenyl Nitrate Solution* — A 1 1500 aqueous solution used as a general antiseptic and for injections of the vagina and cervix. It is supplied in 16 oz bottles. *Merphenyl Nitrate Ointment* — A 1 1500 ointment in an oycholesterol base. It is a rapidly absorbed fungicide and antiseptic of value in a number of skin infections. It is supplied in 1 oz tubes and in 1 lb jars. *Merphenyl Nitrate in Glycerin* — A 1 1000 solution used in mouth and throat infections. It is supplied in 2-oz bottles. *Merphenyl Picrate Tincture* — A 1 200 phenylmercuric picrate solution the solvent being a mixture of acetone, alcohol and water. It is an effective preparation for preoperative skin sterilization. It is supplied in 2 oz bottles — *Am Drug* (May 1935) 109 (T G W)

Metamucil (G D Searle & Co. Chicago Ill.) is the trade name for the mucilaginous con

stituents of the seed of *Plantago ovata* held in dispersion with a specially prepared milk powder. It is recommended as a useful adjuvant in the treatment of constipation, coprostatitis and colitis. It does not irritate the gastric or intestinal mucosa and does not interfere with the digestion. It is supplied in 6-oz and 1 lb containers—*Am Drug* (June 1935), 110 (T G W)

Minerasal (G D Searle & Co, Chicago, Ill) is a granular effervescent mineral food and body alkalinizer containing 14 mineral salts required by the body cells in the proportions suggested by a study of the mineral content of human milk. It is neither diuretic nor laxative in action. Its use is indicated in the treatment of acidosis or hypoalkalinity, gastric hyperacidity, general debility. It is claimed to be of value in the treatment of peptic ulcer. It is supplied in 4 oz screw capped bottles (12 to the carton)—*Am Drug* (July 1935), 76 (T G W)

Miosal-Liquid, Miosal-Ampuls (Istituto Opoterapico, Pisa) contain the aqueous total extract of fresh bovine muscles, put up in containers of 40 cc and in packages of 12 ampuls of 2 cc each—*Pharm Presse*, 40 (1935) 279 (M F W D)

Mucidan Cough Drops (Rhenania, Pharm Abt der Kali-Chemie AG, Berlin NW7) contain ammonium thiocyanate in combination with the saponins of primrose, thyme and polygala, and a calcium salt—*Pharm Zentralh*, 76 (1935), 353 (E V S)

Natrico Pulvoids (Drug Products Co, Inc, Long Island City N Y) are enteric coated green tablets containing potassium nitrate, sodium nitrite, *cretægus oxyacantha* and nitroglycerin ($\frac{1}{250}$ grain per tablet). Their use is indicated for the prevention of cerebral and cardiac accidents and for the symptomatic treatment of hypertension. They are marketed in bottles of 100 tablets—*Am Drug* (Feb 1935), 110 (T G W)

Neda Hair Tonic, Clinical (Neda-Werk, Eduard Palm, München 13), a remedy to prevent loss of hair, contains dilute alcohol, tincture of cantharides, salicylic acid, tannic acid, pilocarpine hydrochloride and oil of bay—*Pharm Zentralh*, 76 (1935), 353 (E V S)

Neo-Trepol (Anglo-French Drug Co, Inc, New York, N Y) is a precipitated bismuth in an aqueous isotonic solution. It is administered by intramuscular injection for those forms of syphilis where the use of bismuth is indicated. It is marketed in packages of 6 and 12, 3 cc ampuls—*Am Drug* (Jan 1935), 108 (T G W)

Nupercainal (Ciba Co, Inc, New York, N Y) is an analgesic and antipruritic ointment containing 1% of alpha-butoxyloxyacetic acid diethyl ethylenediamide (nupercaine) blended with lanolin and petrolatum. The prolonged anesthetic action makes the ointment especially valuable for the relief of pain and itching, occurring in affections of the skin and mucous membranes. It is indicated in burns, sunburn, ordinary eczema, cracked nipples, chapped skin, hemorrhoids and other painful and itching conditions of the skin. It is marketed in 1 oz collapsible tubes and 1 lb tins—*Am Drug* (Feb 1935), 106 (T G W)

Olaixin ointment (Olaixin-Werke, Arzneimittelabrik, Essen Kray), a wound and healing salve for eczema, sores and cutaneous sufferings, is prepared from almond oil (28.0 Gm), phenol (25.0 Gm), lemon oil (1.5 Gm), precipitated sulphur (10.5 Gm), wax (10.0 Gm) and vaseline (25.0 Gm)—*Pharm Zentralh*, 76 (1935), 353 (E V S)

Oholase (Anglo French Drug Co, Inc, New York, N Y) is an iodized oil (40% iodine) designed for radiological examinations. Its use is indicated in the Roentgenological visualization of the spinal canal, the female generative organs and other cavities of the body. It is also of value for intensive iodine chemotherapy without iodism. The administration for radiological examinations is performed according to a special technique, for iodine medication it is administered intramuscularly. It is marketed in boxes of 10, 1-cc ampuls, 6, 2 cc ampuls, and 4, 5 cc ampuls, and in 12 cc bottles—*Am Drug* (Feb 1935) 106 (T G W)

Orgabroom (N V Organon Oss, Netherlands) is a bromine preparation in the form of bouillon cubes prepared with meat extract and vegetable products. Each cube contains 1.2 Gm sodium bromide with vegetable and animal amino acids and peptones. The sodium chloride content is not more than 40 mg per cube. Dose 1-2 cubes, one to two times a day—*Pharm Weekblad*, 72 (1935), 753 (E H W)

Osnol is the new name for *Rheumosnal* (*Pharm Zentralh*, 75 (1935), 336)—*Pharm Zentralh*, 76 (1935) 354 (E V S)

Otalgan is a 5% solution of phenazone in anhydrous glycerin, and is recommended for treatment of non perforated otitis media, and all painful affections of the ear. Sufficient otalgan should be instilled into the ear to fill the acoustic passage. It should be warmed and hot or moist

poultices should not be applied Otagan is a colorless liquid and does not interfere with otoscopic examination It is supplied in bottles of 6 and 10 cc—*Quart J Pharm Pharmacol* 8 (1935) 319 (S W G)

Ovaria Siccata (N V Organon) is no longer prepared defatted, as it has been found that the active constituents (Progesterone and Menformon) are very soluble in fats The undefatted powder is grayer in color—*Pharm Weekblad*, 72 (1935), 825 (E H W)

Pantheric Tablets (Parke, Davis & Co, Detroit, Mich) are enteric coated and chocolate coated tablets containing 5 grains of triple strength pancreatin These are of value in intestinal indigestion and its consequences, such as underweight, fermentative colitis and certain forms of food allergy They are marketed in bottles of 100 and 500 tablets—*Am Drug* (May 1935), 108 (T G W)

Pellitol (Pitman Moore Co, Indianapolis Ind) contains resorcin 5%, bismuth subnitrate bismuth subgallate, oil of cade, zinc oxide, calamine and echinacea in a special lanum petrolatum base It is a protective, anodyne and astringent stimulating healthy granulation and reducing scar tissue to a minimum It is used in subacute and chronic eczemas burns, scalds *pruritis ani* and *vulvæ* and all conditions in which the skin is broken or destroyed It is issued in ounce collapsible tubes and ounce quarter pound and pound jars—*Drug Circ*, 79 (June 1935) 68 (T G W)

Percamal (Gesellschaft für Chemische Industrie Basel) contains 1% Percainum and is a convenient absorbing ointment constituent to which also is added Aqua Hamamelidis and solution of aluminum formate It is used among other things to diminish the pain in burns inflammation of the nipples decubitis, intertrigo, anus fissures, sunburn, etc It is found on the market in tubes of 20 to 40 Gm—*Pharm Weekblad*, 72 (1935), 825 (E H W)

Peristaltine (Ciba Company, Inc, New York, N Y) is a preparation of water soluble glucosides of cascara sagrada It is claimed to produce a laxative effect in 8 to 10 hours, without irritation or disturbance of the digestive tract It is administered orally or hypodermically It is used in all types of chronic constipation, as a prophylactic in intestinal stasis to avoid distension before or after laparotomy It is marketed in bottles of 15, 1½ grain sugar coated tablets and in cartons of 5 and 20 2½ grain (15 cc) ampuls—*Drug Circ* 79 (June 1935) 24 (T G W)

Per-Joodtheodural (Society for Chemical Industry, Katwijk Netherlands) contains calcium salicylate with calcium theobromine, 417 mg, potassium iodide 83 mg, papaverine HCl 30 mg per tablet The tablets are used in high blood pressure, arteriosclerosis etc—*Pharm Weekblad*, 72 (1935), 826 (E H W)

Pertussis Vaccine (Sauer) (Parke, Davis & Co, Detroit Mich) is a bacterial vaccine prepared according to the formula of Dr Louis W Sauer, of Northwestern University Medical School who has used the vaccine successfully in hundreds of children during the past seven years It is an effective immunizing agent against whooping-cough The immunity is established in four months and lasts for five years It is administered by intramuscular injection in each arm, three administrations being sufficient It is supplied in an 8 cc rubber diaphragm capped vial—*Am Drug* (Jan 1935), 108 (T G W)

Phenandyne (Schieffelin & Co New York, N Y) is the acetic acid ester of phenol It is a clear colorless fluid insoluble in water It is a powerful germicide killing such micro organisms as *Staphylococcus pyogenes*, pneumococcus streptococcus and *bacillus coli* It is a non irritating non-caustic analgesic and has proved of value in dental work It is marketed in packages of 12 35 Gm bottles—*Am Drug* (Feb 1935) 106 (T G W)

Phos-Cal (McKesson & Robbins Inc Bridgeport, Conn) is a preparation containing approximately 20 0% calcium and 11 7% phosphorus prepared from pasteurized milk by a special process which removes fats and casein but recovers the unaltered calcium phosphorus milk minerals plus the globulin protein fraction as they occur in fresh milk It is indicated in the treatment of calcium deficiencies and in all cases where increased calcium phosphorus intake is indicated It is issued as the powder in 8-oz bottles and as lozenges in bottles of 18 and 100—*Drug Circ* 79 (June 1935) 25 (T G W)

Phytine (Ciba Co Inc New York, N Y) are tablets composed of calcium magnesium inositolphosphoric acid and containing 12% calcium, 22% phosphorus, 15% magnesium in organic combination It is indicated wherever calcium and phosphorus in a readily assimilable

form is desired, in rickets, osteomalacia, delayed union of fractures, asthma, vasomotor rhinitis, urticaria, tetany, spasmophilic expressions in young children, also useful in nervous affections, convalescence, tuberculosis, pregnancy and lactation. It is issued in bottles of 40, 4 grain tablets—*Drug Circ*, 79 (July 1935), 62 (T G W)

Plastosol is an antiseptic liquid plaster containing copper guaiacol sulphonate and penetrodine, dissolved in a volatile organic solvent. Penetrodine is a new iodine compound of the nature of an ethereal oily liquid which penetrates into crevices and has a stimulant antiseptic action. Copper guaiacol sulphonate coagulates albumins and acts as an astringent and styptic. Plastosol is suggested as a handy first aid dressing for wounds, and for use on operative wounds and varicose and other ulcers before the application of other dressings. It is supplied in bottles fitted with a flattened dropper with which it can be applied. Plastosol is issued in a standard size, and 4-oz dispensary size bottles—*Quart J Pharm Pharmacol*, 8 (1935), 319 (S W G)

Postalan Hemorrhoidal Ointment (Fürstl Furstenberg, Hofapotheke, R. Baur in Donaueschingen) is prepared from ethyl *p* aminobenzoate (5 Gm), bismuth subgallate (5 Gm), zinc oxydate (7.5 Gm), extract of witch-hazel (1.25 Gm), balsam of peru (1.25 Gm), tannic acid (0.5 Gm), menthol (0.5 Gm), and simple ointment (29.0 Gm)—*Pharm Zentrallh*, 76 (1935), 354 (E V S)

Proctoids are suppositories containing zinc oxide 10.00, boric acid 10.00, bismuth oxyiodide 1.67, bismuth subcarbonate 8.33, belladonna, powdered extract, 0.50, ephedrine sulphate 0.1, balsam of peru 1.0, cacao butter to 100. These suppositories are recommended for the treatment of painful and bleeding piles. They combine the astringent and antiseptic qualities of zinc oxide and boric acid, with the antiphlogistic properties of bismuth oxyiodide and the vasoconstrictive effect of ephedrine sulphate. It is an advantage to irrigate the rectum with hot saline or bicarbonate solution before the introduction of a suppository. Proctoids are of "torpedo" shape to facilitate their retention. They are supplied in boxes of 12—*Quart J Pharm Pharmacol*, 8 (1935), 320 (S W G)

Progravid (Renova, Laboratorium für Medizin, Kottbus) is a tablet containing 0.4 Gm cerium oxalate, phenacetin and amidophenazone. It is used in pregnancy vomiting—*Deut Med Wochschr*, 61 (1935), 1003 (H R)

Prokluman (Ciba Co., Inc., New York, N. Y.) or "sistomensin Compound" is the name given to tablets containing sistomensin (ovarian hormone, Ciba), nitroglycerin, amidopyrine, caffeine-sodium-salicylate and peristaltine, Ciba. It is used in the treatment of disturbances connected with the menopause such as ovarian deficiency, depression or exaltation, tachycardia, insomnia and headache. It is supplied in bottles of 40 and 100 tablets—*Am Drug* (Jan 1935), 108 (T G W)

Prolisal (Schering & Glatz, Inc., New York, N. Y.) is the trade name for 'Elixir Alcalinus Salicylatis' a preparation designed for the treatment of colds. Each fluidounce contains 40 grains of sodium citrate, 16 grains of sodium salicylate, 8 grains of potassium guaiacol sulphonate, 24 grains of urotropin and 1.5 grains of extract of cascara combined in an aromatized special elixir. It is marketed in 8 oz bottles—*Am Drug* (Feb 1935), 110 (T G W)

Proviron (Schering Kahlbaum, Berlin) is a standardized male sex hormone. It is found on the market in ampuls—*Pharm Weekblad*, 72 (1935), 826 (E H W)

Puerpal Fever-Serum ("Behringwerke" I. G. Farbenindustrie) is a concentrated streptococcus serum obtained from streptococcus puerpal sepsis—*Deut Med Wochschr*, 61 (1935), 1003 (H R)

Remonol (Seydel Chemical Co., Jersey City, N. J.) is resorcinol mono acetate. It is a thick syrupy oily liquid soluble in alcohol, benzol, chloroform, acetone, and solutions of alkalis. It is insoluble in water. It is indicated for external applications in inflamed conditions of the skin, such as barbers' itch. It is usually applied in alcohol or acetone solution or in the form of an ointment. It is marketed in 1 lb containers—*Am Drug* (Mar 1935), 106 (T G W)

Rhinitol contains menthol 0.5, eucalyptol 0.5, chloral camphor 0.1, chlorthymol 0.01, azulen 0.2, ephedrine 0.25, vasogen to 100. It is recommended as a prophylactic against the common cold. Vasogen is a chemically treated liquid paraffin which readily emulsifies with water and it is claimed that this property increases the efficacy of rhinitol—*Quart J Pharm Pharmacol*, 8 (1935), 320 (S W G)

Rugar (McKesson & Robbins Inc., Bridgeport, Conn.) consists of colloidal barium sul-

phate dispersed in an adhesive medium It coats and paints the lining mucosa in clear outline, thus visualizing the folds of rugæ of the gastro intestinal tract, and facilitates early diagnosis It is used as a contrast medium which enables the early diagnosis of the diseases of the œsophagus stomach and intestines It is supplied in 10 oz jars —*Drug Circ* 79 (June 1935), 68 (T G W)

Ruthmol is a chloride-free table salt, composed of fruit extractives and mineral substances with a sodium and potassium base It can be used as a substitute for common salt in all cases where a salt-free diet is prescribed, such as cardiac disease, with decompensation, renal disease arterio sclerosis, tuberculosis and obesity It taste is indistinguishable from that of sodium chloride, and it possesses the same power of giving piquancy to otherwise tasteless insipid foods Ruthmol is sold in containers of suitable shape for the table and in 1-lb jars —*Quart J Pharm Pharmacol*, 8 (1935), 320 (S W G)

Ryzamin-B (Burroughs Wellcome & Co New York, N Y) is a concentrated and purified fraction of rice polishings, in the form of a thick palatable syrup It has a minimum potency of 50 international units of vitamin B₁ per Gm It is used as a dietary reinforcement for patients of all ages to stimulate appetite and promote utilization of food, also in the specific treatment of beri beri, sprue and other abnormal conditions due to a serious deficiency of vitamin B₁ It is supplied in tubes of ½ oz and jars of 8 oz —*Drug Circ* 79 (June 1935), 68 (T G W)

Sanosin (Chemische Fabrik Perdynamin G m b H Berlin O) is a tablet containing quinine hydrochloride and caffeine each 0.025 Gm, phenacetin 0.1 Gm and amidopyrine 0.076 Gm It is used as an antineuralgic and antipyretic —*Deut Med Wochschr*, 61 (1935), 1003 (H R)

Sarcoptol is a combination of colloidal sulphur with other antiseptic, antiparasitic and analgesic ingredients recommended for the treatment of scabies, seborrhœas, pruritis eczema acne and alopecia It is non toxic and non-irritating and does not stain the skin, linen or clothing It is applied with friction until completely absorbed In cases where the skin is unduly sensitive it may be diluted with 1 part of olive oil to 4 or 5 parts of the liquid In scabies a single application with friction, preceded by a warm bath usually effects a cure Sarcoptol is supplied in 2 oz and 4-oz bottles —*Quart J Pharm Pharmacol* 8 (1935), 320 (S W G)

Sav-Skin (The Doak Co., Cleveland, Ohio) is a protective ointment composed of zinc hydroxide cream It is used as a protection against irritating substances such as liquids fumes or dusts, helpful in the prevention of industrial dermatitis It is supplied in 4 oz and 1 lb jars —*Drug Circ*, 79 (July 1935), 60 (T G W)

Scilloral (Asta A G Chemische Fabrik, Brackwede) is a cardiac substance obtained from *Bulbus scilla* It is supplied in capsules, liquid and suppository form —*Deut Med Wochschr*, 61 (1935) 1003 (H R)

Sedozym (Chemisch-Pharmazeutische A G Bad Homburg Frankfurt a M) is a dry vitamin containing yeast extract with 50% calcium and ammonium bromide It is used as a sedative —*Deut Med Wochschr* 61 (1935) 1003 (H R)

Septicemine (Laboratories Cortial Paris) is a crystallized combination of urotropin with iodine and benzomethyl (methyl benzoate?) It contains 33% iodine It is found on the market in ampuls of 4 cc containing a 10% solution in tablets of 0.2 and 0.5 Gm and in drops Septicemine is employed in acute infections, influenza, broncho pneumonia septicemia, etc The injections are administered intravenously or intramuscularly —*Pharm Weekblad* 72 (1935), 753 (E H W)

Silver-Col (McKesson & Robbins Inc Bridgeport Conn) contains 0.8% eucalyptol 0.15% silver abietate dispersed in liquid petrolatum 80-85 Saybolt at 100° F It is claimed to be a highly germicidal colloidal organic silver compound It is indicated in the prophylaxis and treatment of specific urethritis, congested conditions of the nasopharynx in gynecology for topical application and urethral instillation also for skin infections It is marketed in 2-oz bottles —*Drug Circ*, 79 (July 1935) 62 (T G W)

Sodium Racemic Lactate (Parke Davis & Co Detroit, Mich) is a molar solution of sodium racemic lactate a chemical found by Hartmann and Senn to be of distinct value in the correction of acidosis and for the alkalization of the urine It may be sterilized either by boiling or by autoclaving It is administered intravenously intraperitoneally or subcutaneously and may also be used orally It is supplied in 40 cc ampuls in packages containing 1.6 and 25 ampul —*Am Drug* (Feb 1935) 106 (T G W)

Soricin Sclerosing Solution (Wm S Merrell Co, Cincinnati, Ohio) is a solution composed of 5% Soricin Merrell (sodium ricinoleate 97 to 98% with minute quantities of sodium oleate and sodium linoleate) in distilled water. The pH of the solution is adjusted to approximately 8.0 to assure a stable chemical compound which may be relied upon to produce uniform clinical results in sclerosing varicose veins, a powerful hemolyzing agent forming a soft gelatinous clot which effectively but slowly organizes obliterating varicosities, when introduced into the vein it causes formation of a soft jelly-like thrombus which adheres to the lining of the vein resisting resolutions and absorption, thus an effective obliteration of the vein is produced. It is supplied in 20 cc puncturable cap vials—*Drug Circ*, 79 (July 1935), 28 (T G W)

Sulisocol (Drug Products Co, Inc, Long Island City, N Y) is the trade name for 'Hypo-sols' or (ampuls) containing a clear sterile aqueous isotonic solution of colloidal sulphur. The solution contains 1% of colloidal sulphur. It is administered intravenously or intramuscularly for the treatment of various forms of arthritis and of certain abnormal dermatological conditions. It is supplied in packages of 25 and 100, 1- and 2 cc ampuls—*Am Drug* (Mar 1935), 106 (T G W)

Sulphocide (The Columbus Pharmacal Co) consists of soluble alkaline polysulphides with betanaphthol and aromatics in a special liquid soap. It is used as an antiseptic solution for the prevention and eradication of certain fungus and parasitic invasions. It is supplied in 3 oz bottles—*Drug Circ*, 79 (June 1935), 70 (T G W)

Thiobisarsen (Christina Laboratories, New York, N Y) is composed of the sodium salt of a bismuth derivative of pentavalent organic ester of aminosulphone arsenic acid containing approximately 36% bismuth and 13% arsenic. It is claimed to prevent leucopenia, to cause a rapid disappearance of the treponema from primary and secondary specific lesions. It is used intramuscularly in the treatment of primary, secondary and tertiary syphilis. It is supplied in boxes of 24 and 100, 2-cc ampuls—*Drug Circ*, 79 (July 1935), 62 (T G W)

Thioglycerol Solution 1 50 (Abbott Laboratories, North Chicago, Ill) is a solution of 1 part by weight of thioglycerol in 50 parts by volume of glycerin. It stimulates the growth of epithelial tissue, causes lymph to flow outward toward the wound, produces granulation and epithelial proliferation. It is used in sluggish wounds, due to burns, lacerations or other traumata, varicose ulcers, bed sores, skin grafting. It is issued in boxes of six, 5 cc bottles and bottles of 50 cc—*Drug Circ*, 79 (June 1935), 24 (T G W)

Triglucon (McNeil Laboratories, Phila Pa) is the trade name for capsules representing a combination of iron, copper and calcium gluconates. Each capsule contains 0.032 Gm of iron, 0.00064 Gm of copper plus a sufficient quantity of calcium gluconate. It is an effective alterative and tonic for use in simple and nutritional anemias. It is supplied in both capsules and tablets in bottles of 100, 500 and 1 000—*Am Drug* (Apr 1935), 108 (T G W)

Urgum (The Calco Chemical Co, Inc, Bound Brook, N J) is a mixture of two non water soluble glucosides, scillonin-A and scillonin B derived from squill. Each tablet contains 0.5 mg and each cc of solution contains 1 mg. Its cardiac action is essentially similar to that of digitalis. It is useful in cardiac decompensation in the cardiac arrhythmias in cardiorenal edema. It is issued in bottles of 100, 500 and 1 000 tablets and in solution in bottles of 1 oz, 6 oz and 12 oz—*Drug Circ*, 79 (July 1935), 29 (T G W)

Urinne (Rathkamp Company of Batavia) is the name given to a mixture of vegetable drugs used in the treatment of catarrh of the bladder, kidney and bladder stones. What these East Indian drugs are is not stated. Dr J Blomberg, The Hague is the Netherlands agent—*Pharm Weekblad*, 72 (1935) 753 (E H W)

Verodigen (C F Boehringer and Sons, Mannheim) is a digitalis preparation. It comes on the market in 0.8 mg ampuls corresponding to 0.1 Gm digitalis leaf. Previously Verodigen was only obtainable in tablet form due to the fact that the solution does not keep well. In the new package it occurs in powdered form, i.e., 0.8 mg of Verodigen mixed with 100 mg of glucose. Beside this an equal number of ampuls of double distilled water are enclosed in which the powder may be dissolved just previous to the injection—*Pharm Weekblad*, 72 (1935), 753 (E H W)

Vibeta (Dr Georg Henning, Berlin) is a preparation which is claimed to contain vitamin E. In 1926 Evans and Burr demonstrated that a diet of food free from vitamin E resulted in sterility. They therefore assumed the presence of an antisterility factor which they named vitamin E. One of the richest materials in vitamin E was wheat germ oil. The administration of this oil to women

phate dispersed in an adhesive medium. It coats and paints the lining mucosa in clear outline thus visualizing the folds of rugæ of the gastro intestinal tract, and facilitates early diagnosis. It is used as a contrast medium which enables the early diagnosis of the diseases of the œsophagus stomach and intestines. It is supplied in 10 oz jars—*Drug Circ*, 79 (June 1935) 68 (T G W)

Ruthmol is a chloride free table salt composed of fruit extractives and mineral substances with a sodium and potassium base. It can be used as a substitute for common salt in all cases where a salt-free diet is prescribed, such as cardiac disease, with decompensation, renal disease arterio sclerosis tuberculosis and obesity. Its taste is indistinguishable from that of sodium chloride and it possesses the same power of giving piquancy to otherwise tasteless insipid foods. Ruthmol is sold in containers of suitable shape for the table and in 1 lb jars—*Quart J Pharm Pharmacol*, 8 (1935) 320 (S W G)

Ryzamin-B (Burroughs Wellcome & Co, New York, N Y) is a concentrated and purified fraction of rice polishings, in the form of a thick palatable syrup. It has a minimum potency of 90 international units of vitamin B₁ per Gm. It is used as a dietary reinforcement for patients of all ages to stimulate appetite and promote utilization of food, also in the specific treatment of beriberi, sprue and other abnormal conditions due to a serious deficiency of vitamin B₁. It is supplied in tubes of 1/2 oz and jars of 8 oz—*Drug Circ*, 79 (June 1935) 68 (T G W)

Sanosin (Chemische Fabrik Perdynamin G m b H Berlin O) is a tablet containing quinine hydrochloride and caffeine each 0.025 Gm phenacetin 0.1 Gm and amidopyrine 0.075 Gm. It is used as an antineuralgic and antipyretic—*Deut Med Wochschr*, 61 (1935) 1003 (H R)

Sarcoptol is a combination of colloidal sulphur with other antiseptic, antiparasitic and analgesic ingredients recommended for the treatment of scabies, seborrhœas, pruritis eczema acne and alopecia. It is non-toxic and non-irritating and does not stain the skin, linen or clothing. It is applied with friction until completely absorbed. In cases where the skin is unduly sensitive it may be diluted with 1 part of olive oil to 4 or 5 parts of the liquid. In scabies a single application with friction, preceded by a warm bath usually effects a cure. Sarcoptol is supplied in 2 oz and 4 oz bottles—*Quart J Pharm Pharmacol*, 8 (1935), 320 (S W G)

Sav-Skin (The Doak Co Cleveland, Ohio) is a protective ointment composed of zinc hydroxide cream. It is used as a protection against irritating substances such as liquids, fumes or dusts, helpful in the prevention of industrial dermatitis. It is supplied in 4-oz and 1 lb jars—*Drug Circ*, 79 (July 1935) 60 (T G W)

Scilloral (Asta A G Chemische Fabrik, Brackwede) is a cardiac substance obtained from *Bulbus scilla*. It is supplied in capsules liquid and suppository form—*Deut Med Wochschr*, 61 (1935) 1003 (H R)

Sedozym (Chemisch Pharmazeutische A G Bad Homburg Frankfurt a M) is a dry vitamin containing yeast extract with 50% calcium and ammonium bromide. It is used as a sedative—*Deut Med Wochschr*, 61 (1935) 1003 (H R)

Septicemine (Laboratories Cortial Paris) is a crystallized combination of urotropin with iodine and benzomethyl (methyl benzoate?). It contains 33% iodine. It is found on the market in ampuls of 4 cc containing a 10% solution in tablets of 0.2 and 0.5 Gm and in drops. Septicemine is employed in acute infections influenza, broncho pneumonia septicemia etc. The injections are administered intravenously or intramuscularly—*Pharm Weekblad*, 72 (1935), 733 (E H W)

Silver-Col (McKesson & Robbins Inc Bridgeport, Conn) contains 0.8% eucalyptol 0.15% silver abietate dispersed in liquid petrolatum 80-85 Saybolt at 100° F. It is claimed to be a highly germicidal colloidal organic silver compound. It is indicated in the prophylaxis and treatment of specific urethritis congested conditions of the nasopharynx in gynecology for topical application and urethral instillation also for skin infections. It is marketed in 2-oz bottles—*Drug Circ*, 79 (July 1935) 62 (T G W)

Sodium Racemic Lactate (Parke Davis & Co Detroit Mich) is a molar solution of sodium racemic lactate a chemical found by Hartmann and Senn to be of distinct value in the correction of acidosis and for the alkalization of the urine. It may be sterilized either by boiling or by autoclaving. It is administered intravenously intraperitoneally or subcutaneously and may also be used orally. It is supplied in 40 cc ampuls in packages containing 1.6 and 25 ampuls—*Am Drug* (Feb 1935) 106 (T G W)

Sorcin Sclerosing Solution (Wm S Merrell Co, Cincinnati, Ohio) is a solution composed of 5% Sorcin-Merrell (sodium ricinoleate 97 to 98% with minute quantities of sodium oleate and sodium linoleate) in distilled water. The pH of the solution is adjusted to approximately 8.0 to assure a stable chemical compound which may be relied upon to produce uniform clinical results in sclerosing varicose veins, a powerful hemolyzing agent forming a soft gelatinous clot which effectively but slowly organizes obliterating varicosities, when introduced into the vein it causes formation of a soft jelly like thrombus which adheres to the lining of the vein resisting resolutions and absorption, thus an effective obliteration of the vein is produced. It is supplied in 20 cc puncturable cap vials—*Drug Circ*, 79 (July 1935), 28 (T G W)

Sulisocol (Drug Products Co, Inc, Long Island City, N Y) is the trade name for "Hypo-sols" or (ampuls) containing a clear sterile aqueous isotonic solution of colloidal sulphur. The solution contains 1% of colloidal sulphur. It is administered intravenously or intramuscularly for the treatment of various forms of arthritis and of certain abnormal dermatological conditions. It is supplied in packages of 25 and 100, 1- and 2 cc ampuls—*Am Drug* (Mar 1935), 106 (T G W)

Sulphocide (The Columbus Pharmacal Co) consists of soluble alkaline polysulphides with betanaphthol and aromatics in a special liquid soap. It is used as an antiseptic solution for the prevention and eradication of certain fungus and parasitic invasions. It is supplied in 3-oz bottles—*Drug Circ*, 79 (June 1935), 70 (T G W)

Thobisarson (Christina Laboratories, New York, N Y) is composed of the sodium salt of a bismuth derivative of pentavalent organic ester of aminosulphone arsonic acid containing approximately 36% bismuth and 13% arsenic. It is claimed to prevent leucopenia, to cause a rapid disappearance of the treponema from primary and secondary specific lesions. It is used intramuscularly in the treatment of primary, secondary and tertiary syphilis. It is supplied in boxes of 24 and 100, 2-cc ampuls—*Drug Circ*, 79 (July 1935), 62 (T G W)

Thioglycerol Solution 1 50 (Abbott Laboratories, North Chicago, Ill) is a solution of 1 part by weight of thioglycerol in 50 parts by volume of glycerin. It stimulates the growth of epithelial tissue, causes lymph to flow outward toward the wound, produces granulation and epithelial proliferation. It is used in sluggish wounds, due to burns, lacerations or other traumata, varicose ulcers, bed sores, skin grafting. It is issued in boxes of six, 5-cc bottles and bottles of 50 cc—*Drug Circ*, 79 (June 1935), 24 (T G W)

Tinglucon (McNeil Laboratories Phila. Pa) is the trade name for capsules representing a combination of iron, copper and calcium gluconates. Each capsule contains 0.032 Gm of iron, 0.00064 Gm of copper plus a sufficient quantity of calcium gluconate. It is an effective alternative and tonic for use in simple and nutritional anemias. It is supplied in both capsules and tablets in bottles of 100, 500 and 1,000—*Am Drug* (Apr 1935), 108 (T G W)

Urginin (The Calco Chemical Co, Inc, Bound Brook, N J) is a mixture of two non-water-soluble glucosides, scillonin-A and scillonin B, derived from squill. Each tablet contains 0.5 mg and each cc of solution contains 1 mg. Its cardiac action is essentially similar to that of digitalis. It is useful in cardiac decompensation, in the cardiac arrhythmias, in cardiorenal edema. It is issued in bottles of 100, 500 and 1,000 tablets and in solution in bottles of 1 oz, 6 oz and 12 oz—*Drug Circ* 79 (July 1935), 29 (T G W)

Urrnine (Rathkamp Company of Batavia) is the name given to a mixture of vegetable drugs used in the treatment of catarrh of the bladder, kidney and bladder stones. What these East Indian drugs are is not stated. Dr J Blomberg, The Hague, is the Netherlands agent—*Pharm Weekblad* 72 (1935), 753 (E H W)

Verodigen (C F Boehringer and Sons, Mannheim) is a digitalis preparation. It comes on the market in 0.8 mg ampuls corresponding to 0.1 Gm digitalis leaf. Previously Verodigen was only obtainable in tablet form due to the fact that the solution does not keep well. In the new package it occurs in powdered form, i.e. 0.8 mg of Verodigen mixed with 100 mg of glucose. Beside this an equal number of ampuls of double distilled water are enclosed in which the powder may be dissolved just previous to the injection—*Pharm Weekblad*, 72 (1935) 753 (E H W)

Vibeta (Dr Georg Henning, Berlin) is a preparation which is claimed to contain vitamin E. In 1926 Evans and Burr demonstrated that a diet of food free from vitamin E resulted in sterility. They therefore assumed the presence of an antisterility factor which they named vitamin E. One of the richest materials in vitamin E was wheat germ oil. The administration of this oil to women

phate dispersed in an adhesive medium. It coats and paints the lining mucosa in clear outline thus visualizing the folds of rugae of the gastro intestinal tract and facilitates early diagnosis. It is used as a contrast medium which enables the early diagnosis of the diseases of the oesophagus stomach and intestines. It is supplied in 10-oz jars—*Drug Circ* 79 (June 1935) 68 (T G W)

Ruthmol is a chloride free table salt composed of fruit extractives and mineral substances with a sodium and potassium base. It can be used as a substitute for common salt in all cases where a salt free diet is prescribed such as cardiac disease with decompensation renal disease arterio sclerosis tuberculosis and obesity. Its taste is indistinguishable from that of sodium chloride and it possesses the same power of giving piquancy to otherwise tasteless insipid foods. Ruthmol is sold in containers of suitable shape for the table and in 1 lb jars—*Quart J Pharm Pharmacol* 5 (1935) 320 (S W G)

Ryzamin-B (Burroughs Wellcome & Co New York N Y) is a concentrated and purified fraction of rice polishings in the form of a thick palatable syrup. It has a minimum potency of 50 international units of vitamin B₁ per Gm. It is used as a dietary reinforcement for patients of all ages to stimulate appetite and promote utilization of food also in the specific treatment of beriberi sprue and other abnormal conditions due to a serious deficiency of vitamin B₁. It is supplied in tubes of 1/2 oz and jars of 5 oz—*Drug Circ* 79 (June 1935) 68 (T G W)

Sanosin (Chemische Fabrik Perdyngmin G m b H Berlin O) is a tablet containing quinine hydrochloride and caffeine each 0.025 Gm phenacetin 0.1 Gm and amidopyrine 0.076 Gm. It is used as an antineuralgic and antipyretic—*Deut Med Wochschr* 61 (1935) 1003 (H R)

Sarcoptol is a combination of colloidal sulphur with other antiseptic antiparasitic and analgesic ingredients recommended for the treatment of scabies seborrhoeas pruritis eczema tene and alopecia. It is non toxic and non irritating and does not stain the skin linen or clothing. It is applied with friction until completely absorbed. In cases where the skin is unduly sensitive it may be diluted with 1 part of olive oil to 1 or 5 parts of the liquid. In scabies a single application with friction preceded by a warm bath usually effects a cure. Sarcoptol is supplied in 2 oz and 1 oz bottles—*Quart J Pharm Pharmacol* 5 (1935) 320 (S W G)

Sav-Skin (The Dork Co Cleveland Ohio) is a protective ointment composed of zinc hydroxide cream. It is used as a protection against irritating substances such as liquids fumes or dusts helpful in the prevention of industrial dermatitis. It is supplied in 4-oz and 1 lb jars—*Drug Circ* 79 (July 1935) 60 (T G W)

Scilloral (Astra A G Chemische Fabrik Brackwede) is a cardiac substance obtained from *Bulbus scilla*. It is supplied in capsules liquid and suppository form—*Deut Med Wochschr* 61 (1935) 1003 (H R)

Sedozym (Chemisch Pharmaceutische A G Bad Homburg Frankfurt a M) is a dry vitamin containing yeast extract with 30% calcium and ammonium bromide. It is used as a sedative—*Deut Med Wochschr* 61 (1935) 1003 (H R)

Septicemine (Laboratoires Cortril Paris) is a crystallized combination of urotropin with iodine and benzomethyl (methyl benzoate?). It contains 33% iodine. It is found on the market in ampuls of 4 cc containing a 10% solution in tablets of 0.2 and 0.5 Gm and in drops. Septicemine is employed in acute infections influenza broncho pneumonia septicemia etc. The injections are administered intravenously or intramuscularly—*Pharm Weekblad* 72 (1935) 753 (E H W)

Silver-Col (McKesson & Robbins Inc Bridgeport Conn) contains 0.85% eucalyptol 0.15% silver abietate dispersed in liquid petrolatum 80-85 Saybolt at 100° F. It is claimed to be a highly germicidal colloidal organic silver compound. It is indicated in the prophylaxis and treatment of specific urethritis congested conditions of the nasopharynx in gynecology for topical application and urethral instillation also for skin infections. It is marketed in 2 oz bottles—*Drug Circ* 79 (July 1935) 62 (T G W)

Sodium Racemic Lactate (Parke Davis & Co Detroit Mich) is a molar solution of sodium racemic lactate, a chemical found by Hartmann and Senn to be of distinct value in the correction of acidosis and for the alkalization of the urine. It may be sterilized either by boiling or by autoclaving. It is administered intravenously intraperitoneally or subcutaneously and may also be used orally. It is supplied in 10 cc ampuls in packages containing 1.6 and 25 ampuls—*Am Drug* (Feb 1935) 100 (T G W)

Soricin Sclerosing Solution (Wm S Merrell Co, Cincinnati, Ohio) is a solution composed of 5% Soricin Merrell (sodium ricinoleate 97 to 98% with minute quantities of sodium oleate and sodium linoleate) in distilled water. The pH of the solution is adjusted to approximately 8.0 to assure a stable chemical compound which may be relied upon to produce uniform clinical results in sclerosing varicose veins, a powerful hemolyzing agent forming a soft gelatinous clot which effectively but slowly organizes obliterating varicosities, when introduced into the vein it causes formation of a soft jelly like thrombus which adheres to the lining of the vein resisting resolutions and absorption, thus an effective obliteration of the vein is produced. It is supplied in 20 cc puncturable cap vials—*Drug Circ*, 79 (July 1935), 28 (T G W)

Sulsocol (Drug Products Co, Inc, Long Island City, N Y) is the trade name for "Hypo soils" or (ampuls) containing a clear sterile aqueous isotonic solution of colloidal sulphur. The solution contains 1% of colloidal sulphur. It is administered intravenously or intramuscularly for the treatment of various forms of arthritis and of certain abnormal dermatological conditions. It is supplied in packages of 25 and 100, 1- and 2 cc ampuls—*Am Drug* (Mar 1935), 106 (T G W)

Sulphocide (The Columbus Pharmacal Co) consists of soluble alkaline polysulphides with betanaphthol and aromatics in a special liquid soap. It is used as an antiseptic solution for the prevention and eradication of certain fungus and parasitic invasions. It is supplied in 3 oz bottles—*Drug Circ*, 79 (June 1935), 70 (T G W)

Thiobisarsen (Christina Laboratories, New York, N Y) is composed of the sodium salt of a bismuth derivative of pentavalent organic ester of aminosulphone arsonic acid containing approximately 36% bismuth and 13% arsenic. It is claimed to prevent leucopenia, to cause a rapid disappearance of the treponema from primary and secondary specific lesions. It is used intramuscularly in the treatment of primary, secondary and tertiary syphilis. It is supplied in boxes of 24 and 100, 2 cc ampuls—*Drug Circ*, 79 (July 1935), 62 (T G W)

Thioglycerol Solution I 50 (Abbott Laboratories, North Chicago, Ill) is a solution of 1 part by weight of thioglycerol in 50 parts by volume of glycerin. It stimulates the growth of epithelial tissue, causes lymph to flow outward toward the wound, produces granulation and epithelial proliferation. It is used in sluggish wounds, due to burns, lacerations or other traumata, varicose ulcers, bed sores, skin grafting. It is issued in boxes of six, 5 cc bottles and bottles of 50 cc—*Drug Circ*, 79 (June 1935), 24 (T G W)

Tringluon (McNeil Laboratories, Phila Pa) is the trade name for capsules representing a combination of iron copper and calcium gluconates. Each capsule contains 0.032 Gm of iron, 0.00064 Gm of copper plus a sufficient quantity of calcium gluconate. It is an effective alternative and tonic for use in simple and nutritional anemias. It is supplied in both capsules and tablets in bottles of 100, 500 and 1 000—*Am Drug* (Apr 1935), 108 (T G W)

Urginin (The Calco Chemical Co, Inc, Bound Brook, N J) is a mixture of two non-water soluble glucosides, scillonin-A and scillonin B, derived from squill. Each tablet contains 0.5 mg and each cc of solution contains 1 mg. Its cardiac action is essentially similar to that of digitalis. It is useful in cardiac decompensation, in the cardiac arrhythmias in cardiorenal edema. It is issued in bottles of 100, 500 and 1 000 tablets and in solution in bottles of 1 oz, 6 oz and 12 oz—*Drug Circ*, 79 (July 1935), 29 (T G W)

Urinine (Rathkamp Company of Batavia) is the name given to a mixture of vegetable drugs used in the treatment of catarrh of the bladder, kidney and bladder stones. What these East Indian drugs are is not stated. Dr J Blomberg, The Hague, is the Netherlands agent—*Pharm Weekblad*, 72 (1935) 753 (E H W)

Verodigen (C F Boehringer and Sons, Mannheim) is a digitalis preparation. It comes on the market in 0.8 mg ampuls corresponding to 0.1 Gm digitalis leaf. Previously Verodigen was only obtainable in tablet form due to the fact that the solution does not keep well. In the new package it occurs in powdered form \pm 0.8 mg of Verodigen mixed with 100 mg of glucose. Beside this an equal number of ampuls of double distilled water are enclosed in which the powder may be dissolved just previous to the injection—*Pharm Weekblad*, 72 (1935) 753 (E H W)

Vibeta (Dr Georg Henning, Berlin) is a preparation which is claimed to contain vitamin E. In 1926 Evans and Burr demonstrated that a diet of food free from vitamin E resulted in sterility. They therefore assumed the presence of an antisterility factor which they named vitamin E. One of the richest materials in vitamin E was wheat germ oil. The administration of this oil to women

subject to having miscarriages appeared to result in a favorable reaction. The firm of Dr G Henning has a similar preparation on the market which was investigated by P Schoorl in the laboratory of Prof Geyns at Wageningen, and in which no antisterility factor could be demonstrated.—*Pharm Weekblad*, 72 (1935) 754 (E H W)

Virapaine (Dr I Donath, Pressburg) is an ointment containing bee poison. It comes in two strengths, normal and forte, and is used in the treatment of rheumatism.—*Pharm Weekblad* 72 (1935) 754 (E H W)

Vireysate (Irrit Bischoff Co. Inc. New York, N. Y.) is a dialysate of *Viscum album* (Mistletoe). It is claimed to be a vasodilator acting upon the small blood vessels and thereby permitting easier circulation. It reduces high blood pressure without disturbing digestion or the nervous system. It also gives relief in *angina pectoris* and may be used prophylactically. It is supplied in bottles of 30 cc. and in bottles of 25 and 50 tablets.—*Drug Circ* 79 (July 1935) 60 (T G W)

Vistonic Syrup (La Synthe Chimique, Vienna, 16th dist.) contains copper chlorophyll, iron and manganese glycerophosphates, quinine, caffeine and extract of strychnine, put up in packages of 115 Gm.—*Pharm Presse* 10 (1935) 279 (M F W D)

Vistonic Tablets (La Synthe Chimique, Vienna, 16th dist.) contain copper chlorophyll, iron and manganese glycerophosphates, quinine, caffeine and 0.0025 Gm. extract of strychnine per tablet, put up in packages of 20 tablets.—*Pharm Presse* 10 (1935) 279 (M F W D)

BACTERIOLOGY

Antimeningococcic Serum. Protection of Mice against Meningococcus Infection by Polyvalent. Mice were injected with suspensions of meningococci (0.5 cc./20 Gm.) to find several virulent strains. These strains were then used to test the efficacy of various sera. It was found that intravenous injection of serum was no more efficient than intraperitoneal, so the latter method was used. The sera were most efficient when injected (0.5 cc.) 4 hours previous to intraperitoneal injection of the meningococci. Ordinarily high agglutinating power corresponded to high bactericidal power of the serum, but not always. Many of the polyvalent commercial sera gave good protection even in dilutions of 1:100. Several experimental antitoxins also gave good protection. Normal horse sera showed great variation, but were not effective when diluted. Serum E, which was 5 years old, was the least effective. Tables references.—S F BRANHAM *Pub Health Repts* 50 (1935) 765 through *Squibb Inst. Bull* 8 (1935) 1933

Antistreptococcic Serums—Application of, of a New Method of Titration by Neutralization of the Antibodies in Vitro. The use of animals for the titration of streptococcus serums presents several difficulties. Some samples isolated from human infections frequently lose their pathogenic power on animal experimentation. Animals show varying power of resistance and the problem is further complicated by the existence of multiple races of antigens. The authors have applied their principle of finding the maximum volume of serum which is deprived of its antibodies by a known weight of dry antigen. Varying volumes of serum are placed in contact with a constant weight of streptococcal antigen and the presence of liberated antibodies is detected by the precipitation produced by a streptococcal extract. The method is similar to that employed with pneumococcal serum (*Compt rend*, 200 (1935) 2039). Results obtained by this method compared favorably with those obtained on rabbits *in vivo* and permit the foreseeing of the activity of the serum and the survival of the course of the immunization with animals.—LOUIS COTONI and JACQUES POCION *Compt rend*, 201 (1935) 100 (G W H)

Bacterial Cells—Microscopic Method of Distinguishing Dead from Living. Neutral red was used in distinguishing microscopically between dead and living cells. Cells of *Escherichia coli*, *Schizosaccharomyces pombe* and a yeast isolated from ale were considered dead whenever the cytoplasm proper was tinged even slightly with stain. The concentration of neutral red varies with the organisms. In the case of *Escherichia coli* a concentration of 0.005% was adopted. This concentration is harmless even to the youngest and most sensitive cells, and the organism grows readily in broth containing neutral red in that concentration.—GEORGES KNAISI *J Bacteriol*, 30 (1935) 193 (A H B)

Bacteriophage—I. Studies on the Nature of Bacteriophage can apparently be extracted wholly or in part unharmed from aqueous solutions by ether. The rate and completeness of extraction are influenced by agitation and by time. Unless there is a prolonged period of contact

some bacteriophage remains in the water phase. This residual bacteriophage may be restored to the original potency by serial transfer.—J D LEMAR and J T MYERS. *J Infect Diseases*, 57 (1935), 5 (A H B)

Bacteriophage—II Studies on the Nature of Incubation, autoclaving, secondary incubation and oxidation of bacterial broth cultures by hydrogen peroxide yielded lytic filtrates, gave good results when such organisms as *E. coli*, *E. typhosus*, *S. enteritidis* and *Staphylococcus aureus* were grown in broth for forty eight hours, autoclaved twenty minutes at 15 lbs pressure, again incubated for forty eight hours at 37° C and oxidized for forty eight hours at 37° C by 15 cc of 3% hydrogen peroxide. The lytic agent could be removed from water by extraction with ether. It was filterable and transmissible in series. It produced plaques on solid media.—J D LEMAR and J T MYERS. *J Infect Diseases* 57 (1935), 11 (A H B)

Bacteriophage—Use of, in the Treatment of Urinary Infections Wehrbein's experience with the technique of phage application showed that the phage must be absolutely and quickly effective before it is used. It should lyse a billion microorganisms per cc in 3-5 hours and prolonged incubation should show no second growth. The phage should be placed in as large a quantity and in as concentrated a form as possible in the infected area. If the kidney pelvis is infected the pelvis should be actually filled with the phage solution. If the bladder only is infected at least 50 cc should be placed into the empty bladder. All antiseptics must be avoided. If the first application of the phage is unsuccessful it is useless to repeat. Of the 34 cases treated by phage and followed completely 10 were acute pyelitic cases and of these 7 were cured through 1 application. The other 3 were improved but not cured. Of the 24 chronic and subacute cases of pyelitis only 5 were cured 13 were benefited and 6 were failures. An appendix by Louis Nerb concerns the preparation of phages. Bacteriophages produced by heat were found to have a higher titre and be more potent than that produced by cold.—H L WEHRBEIN. *Am J Surg*, 29 (1935) 40, through *Squibb Abstr Bull* 8 (1935), A 993

Bacterium Typhi Flavum—Study of the So-Called The results of a study of 19 strains of the so-called *Bacterium typhi flavum* are given. It is suggested that any relation of the *Bacterium typhi flavum* to enteric infections is unproved and that its appropriate place is in the genus *Chromobacterium*.—J C CRICKSHANK. *J Hygiene*, 35 (1935) 354 (A H B)

Chloramine-T and Calcium Hypochlorite—Some Observations on the Germicidal Efficiency of The reduction in killing time was about 55% for each doubling of the concentration of Chloramine T. The pH range studied was from 6.0 to 8.8, and it was found that increasing the acidity markedly reduced the killing time. "Available chlorine" was not found to be a direct measure of the germicidal efficiency of the calcium hypochlorite studied.—D B CHARLTON and M LEVINE. *J Bacteriol*, 30 (1935), 163 (A H B)

Cholera Group of Vibrios—Antigens of By preparing the serum with suspensions boiled or steamed for 2 hours to destroy the common H antigen, bacteriological proof of "cholera" or a cholera carrier should rest on the isolation of a non haemolytic vibrio with the specific O antigen of subgroup I.—A D GARDNER and K V VENKATRAMAN. *J Hygiene*, 35 (1935), 281-82 (A H B)

Colds—New Explanation of The fact that outdoor workers, seamen and arctic inhabitants rarely have colds has led practitioners to doubt the influence of cold on sickness. F Munk has shown that there is a difference in potential between the nasal mucous membranes and the moistened palm of the hand, and that exposure of the feet to cold lowers the potential difference. Since all organisms have an electrical biological optimum and minimum, and since various irritations reduce the potential of the mucous membranes of the air passages the virulence of the organisms is allowed to increase thus beginning infections.—J B L. *Schweiz Apoth-Ztg* 73 (1935), 369 (M F W D)

Diphtheria Antatoxin—Purification and Concentration of Sodium 7 amino 1,3,6 naphthalenetrisulphonate and citric acid at about pH 4 rapidly and completely precipitated the active principles of diphtheria toxin and antatoxin, and allowed recovery in a purified and concentrated condition of about 75% of the original toxin and 95% of the original antatoxin.—H GOLDBERG. *Compt rend soc biol* 119 (1935), 518, through *Squibb Abstr Bull* 8 (1935) A 924

Diphtheria Cultures—Culture Media Used for Routine with a Suggested Modification of Loeffler's Blood Serum Medium Media used should be of a composition and reaction which would support luxuriant growth and permit the development of what are termed "typical forms"

of *C. diphtheriae* to facilitate the examination of cultures. *S. aureus* produces sufficient acid from the dextrose in Loeffler's medium in 18 hours to influence greatly the luxuriance of growth, morphology and staining of *C. diphtheriae*. The following formula gives a more typical and more luxuriant growth of *C. diphtheriae* in mixed throat cultures than Loeffler's blood serum.

Hog or human serum	800 cc
Glycerol	40 cc
Sodium sulphide (sodium monosulphide) dissolved in 10 cc. of cold water	1.50 Gm
Bouillon concentrate	1.60 cc
Bouillon concentrate—	
Protein & peptone	1.25 Gm
Dipotassium phosphate	1.25 Gm
Cystine	0.5 Gm
Water	160 cc

Requires from 5 to 10 cc. of normal sodium hydroxide solution per liter of the mixture.—ROSS L. LAYBOURN. *Am J Pub Health* 25 (1935) 796. (A H B)

Diphtheria Toxin. Skin Reaction of. The cutaneous reaction to pure diphtheria toxin was used to determine susceptibility to diphtheria. The test did not always correspond with the routine Schick test and it was a little hard to be sure of a positive reaction.—G. ANDRIEU and A. FOURNAIR. *Compt rend soc biol* 119 (1935) 35 through *Squibb Inst Bull*, 8 (1935) A 924.

Disinfectants.—Testing of, in the Presence of Organic Matter. This paper develops a method in which a suspension of yeast is used for testing disinfectants which introduce faeces as added organic matter and causes an equivalent reduction in disinfectant activity and yields consistent results.—I. P. GARROD. *J Hygiene (British)*, 35 (1935) 219. (A H B)

Ergot Cultures, Saprophytic.—Alkaloidal Content and Activity of. Ergot cultures were grown by inoculating various nutrient media with the fungus mycelium and the alkaloidal content of the artificial cultures was then studied in relation to the character of the medium, pH and influence of light. The nutrient medium base consisted of 2% agar with 0.1% monopotassium phosphate and 0.02% magnesium sulphate. Its composition was varied in the proportion of carbohydrate and protein by the addition of 10% dextrose, 5% maltose, 5% mannitol and (or) 1% asparagine, 3% gelatin, 2% peptone and 1% leucine. The alkaloidal content of the different cultures was determined colorimetrically by the use of *p*-diethylaminobenzaldehyde. The influence of light on alkaloidal content was negligible but variations in the composition of the nutrient media caused wide fluctuations in alkaloidal content. Leucine proved of little value as a source of protein. The combinations dextrose-leucine and maltose-leucine produced cultures of very low alkaloidal content. Germination did not occur on mannitol-leucine medium. Peptone gave good results in combination with all three carbohydrates especially with maltose. Of the carbohydrates, maltose gave the best results in any of the combinations studied. In general, well developed cultures possessed high alkaloidal contents but the parallel between alkaloidal content and mycelial growth did not apply in all cases, an exception being found in the combination dextrose-asparagine. The alkaloidal contents estimated by the Broom-Clark method were not in agreement with the values obtained by the colorimetric method.—R. JARETZKY. *Arch Pharm* 273 (1935), 348. (L L M)

Extra-Bacterial Substances in Cultures.—Production of. On saccharose media bacteria of the subtilis group produce abundantly a non-stainable extra-bacterial substance capable of multiplication without intervention of bacteria. The extra-bacterial substance spreads out from the subtilis colonies on the surface of nutrient agar plates forming a halo around the colonies. The properties of the extra-bacterial substance and the growth phenomena, especially the extension of the halo on the agar surface, strongly suggest that the extra-bacterial substance contains living organisms. Morphological observations give further support to this conclusion.—L. DIENES. *J Infect Diseases*, 57 (1935), 44–45. (A H B)

Extracts of Drug Plants.—Action of Aqueous, on Bacterium Coli and Aspergillus Niger. Extracts of 46 plants were examined. The freshly powdered plant was extracted 1 hour with water at 50° C (1 part of plant and 2 parts of water). The extracts were filtered, the pH determined, germ content and action toward *B. coli* and *Aspergillus* determined. The plant residues were ob-

served as to the manner of the decomposition. The germ content was determined as follows: Mix 1 cc of the extract with standard 11 Nahr agar (Merck) in a petri dish and with the aid of a Wollfugel plate count the organisms after 24 hours (37° C), repeat the count after an additional 24 hours. Results show extracts in which the number of organisms decreased rapidly after 24 hours, in many the growth was strongly retarded, in most cases many organisms were present, a few became sterile after days or weeks, a few putrified and the majority molded. As a rule the p_H of the extract decreased sharply. *The Action of the Plant Sap on B. coli*—5 cc of the extract was kept with 1 drop of a 24 hour bouillon culture of *B. coli* for 48 hours at 37° C and then at room temperature. The control tubes contained 5 cc bouillon and 1 drop of culture. A dilution series of 2.5 cc of extract plus 2.5 cc bouillon and 1 drop of culture was treated in the same manner. Sterilized (3/4 hour at 100° C) and non sterile extracts were so treated. The tests showed that after some days, and in a few cases weeks, a great portion of the extracts (33) were sterile. In no case can any relationship between p_H and sterility be revealed. The death of the organisms apparently is due to definite plant constituents. *Aspergillus niger*—In like manner the action on these spores was studied. From a thriving culture on a beer yeast agar slant was prepared a suspension with physiological salt solution. To 5 cc (or a dilution of 2.5 cc + 2.5 cc) of the plant extract was added a drop of the spore suspension. The tubes were incubated as before. Only a few extracts hindered the growth of the spores.—H. SCHINDLER and T. MÖBUS. *Apoll-Ztg*, 50 (1935), 559-561 (H. M. B.)

H. Pertussis—Phases or Types of By absorption and agglutination tests *H. pertussis* is a uniform species without any type variations. It has, however, different phases of existence as shown by absorption phenomenon.—J. A. TOOMEY, K. RANTA, L. ROBEY and J. E. McCLELLAND. *J. Infect. Diseases* 57 (1935), 56 (A. H. B.)

Immunizing Preparations Antibodies are obtained from human or animal urine during convalescence from infectious diseases. The urine (after filtration and dialysis) may be treated with an albumin precipitant, e. g., lead subacetate, phosphotungstic acid, mercuric chloride, sulphosalicylic acid, formalin, alcohol, or ammonium sulphate, and the antibodies recovered from the precipitate, or the antibodies may be extracted from the urine by absorbents, e. g., aluminum hydroxide, kaolin, Fuller's earth, silica gel, calcium carbonate or calcium phosphate, or urine, after extraction with ether or similar solvent to remove impurities, may be concentrated or mixed with an inert medium and dried. Precipitates made with heavy metal salts are treated with hydrogen sulphide to remove said metals and the remaining solution may be further purified by dialysis, precipitates made with other than heavy metal salts are dialyzed to remove the precipitants and the remaining solid is extracted with sodium chloride solution or weakly alkaline Ringer solution to yield the antibody.—G. MADAUS, F. MADAUS and H. MADAUS (trading as Madaus & Co). *Brit. Pat.* 423 883 (Feb. 11 1935), through *Chem. Abstr.*, 29 (1935), 4525.

Indole—Bacteriostatic Action of, on Gram-Negative Enteric Bacilli and on Certain Cocci Small amounts of indole inhibited the growth of many enteric bacilli. Its effectiveness varied greatly with different species and even with different strains of the same species, but not appreciably for individual cultures on repeated tests. The indole content of intestinal material may play an important role in determining the character of the intestinal flora. Members of the Escherichia Aerobacter group and both *Staph. aureus* and *Staph. albus* were equally resistant, while some of the bacilli and some of the cocci were equally sensitive.—R. P. TITSLER and L. A. SANDHOLZER. *J. Infect. Diseases* 57 (1935), 68 (A. H. B.)

Koch's Phenomenon—The Production of, with Various Strains of Tubercle Bacilli In tuberculous animals intracutaneous injection of dissociated strains of tubercle bacilli (R and S forms) produced Koch's phenomenon, which is a marked necrosis, in a definite and uniform manner. Animals with generalized tuberculosis R strains, excited in the majority of cases an intense Koch's phenomenon while S strains either failed to produce the phenomenon or produced it only in an atypical form.—W. PAGEL. *J. Path. Bacteriol.* 41 (1935), 95 (A. H. B.)

Oxybenzoic Acid Esters—Researches with, for Sterilization of Eye Drops Various eye drop solutions were prepared using as the diluent a 0.05% solution of Nipasol (propyl ester of *p*-oxybenzoic acid). The solutions were transferred to sterile glass stoppered bottles. The solutions were sterile after preparation. Each of the eye solutions was then inoculated with a loopful of cultures of *Pyogenes aureus*, *Bacterium coli* and *Aspergillus Art*. At intervals 1 cc of the eye solution was plated on about 10 cc of nutrient bouillon and incubated. In one to three days the

solutions were found to be sterile again. No spore bearing cultures were used. A series run in the same manner using a 0.2% solution of Nipagin (methyl ester of *p* oxybenzoic acid) were sterile within 24 hours. A series of the same eye drops inoculated with suspensions of *Mesentericus* and *Aspergillus* spores was not sterile after 14 days. Another series of eye drops was prepared using a 0.1% and a 0.15% solution of Nipa Sterilisator I (a combination of *p* oxybenzoic acid esters) and each of the sterile solutions inoculated with spore bearing material as above. After 14 days at room temperature the solutions were not yet sterile. A second series prepared exactly the same but sterilized in steam at 100° for 30 minutes was sterile in all cases. A 0.3% solution of 'Nipa Sterilisator I' and 30 minutes steam at 100° merely inhibited but did not destroy native earth spores. More extensive work must be carried out to determine whether the combination of heat and Nipa Sterilisator I affect injuriously other medicaments used in eye solutions.—J. THOMAS. *Pharm Acta Helv* 10 (1935) 103. (M F W D)

Pleuro-Pneumonia Contagiosa Boum—Study of the Morphology and Life Cycles of. The causid organism of *pleuropneumonia contagiosa boum* is not a filterable virus *sensu stricto* but typically and constantly forms a relatively enormous branching mycelium which owes its filterability to the constant and early production of filter passing forms (comoidoids), with polygenethodism, extreme pleomorphism and a protean faculty of rapidly changing its shape.—A. W. TURNER. *J. Path. Bacteriol.* 41 (1935) 29. (A H B)

Pneumococcus Solubility of, in Saponin. With saponin in 1:20 concentration, and cholesterol in 1:5000 to 1:500000 concentration lysis often appears within a few minutes and is usually complete within thirty minutes at room temperature. The bacterial suspension becomes completely clarified and transparent. No intact bacteria are to be found on microscopic examination in the case of complete lysis. S. J. KLIN. *J. Bacteriol.* 30 (1935) 47. (A H B)

Rocky Mountain Spotted Fever Results of Ten Years' Prophylactic Vaccination. Preparation of Rocky Mountain fever vaccine makes use of the virus laden adult Rocky Mountain wood ticks which after feeding for three to five days on guinea pigs are sterilized externally. They are then thoroughly comminuted mechanically with sterile sand in lots of 500 in a small amount of physiological salt solution containing either 2% of phenol alone or the same percentage of a phenol formalin mixture. After grinding sufficient of the preservative is added to bring the total volume to 100 cc. In seven days 300 cc of physiological salt solution is added and the product centrifuged to throw down the tick tissue and sand. The resultant supernatant fluid is the vaccine. No method of potency standardization has been devised. It is considered usable if four of six guinea pigs that receive 1 cc each are fully protected against a subsequent injection of 1 cc of guinea pig passage virus (blood). The recommended minimum dosage is two injections of 2 cc each for adults.—R. R. PARKER. *J. Infect. Diseases* 57 (1935) 78. (A H B)

Scarlet Fever Toxin and Antitoxin—Testing of, by the Rabbit Intradermal Method. This paper describes a method of titrating scarlet fever toxins and sera on the skin of rabbits with mixtures of toxins and antitoxins which are heated to 50° C for two hours and injected intradermally into rabbits; the test proving reliable within a 1:2 ratio. A pre injection given intravenously with a small quantity of an antitoxic serum a day before the intradermal injections improves the reactions and the number of animals which fail to give readings is reduced.—G. A. H. BUTTLE and A. S. R. TOWSON. *J. Path. Bacteriol.* 41 (1935) 115. (A H B)

Skatole—Bacteriostatic Action of, on Gram-Negative Enteric Bacilli. It is evident from the results of this study that small amounts of skatole from 1:3000 to 1:6000 inhibited the growth of gram negative enteric bacilli. The average antiseptic potency of skatole is approximately twice that of indole.—R. R. TITSLER, L. A. SANDHOLZER and E. T. CALLAHAN. *J. Infect. Diseases* 57 (1935) 57. (A H B)

Smallpox and Diphtheria—Simultaneous Immunization against. The simultaneous immunization against diphtheria and smallpox is a practical, effective and safe procedure.—CHARLES S. STERN. *Am. J. Pub. Health* 25 (1935), 1035. (A H B)

Staphylococcus Toxin Toxins of high lytic activity were obtained by growing certain strains of staphylococcus in an atmosphere of 10-24% carbon dioxide. The toxin dissolves blood and tissue cells, coagulates plasma and dissolves fibrin. It has high antigenic qualities.—J. TRAVASSOS. *Memor. Inst. Butantan* (S. Paulo), 8 (1933-1934), *Rev. sud americana endocrinol. immunol. quimioterap.*, 18 (1935), 442-443. (A E Meyer)

Sterility—Visible Test for. As the result of work by G. Gosio and others in the (Italian)

Public Health Laboratories it was shown that schizomycetes when growing in a medium containing minute amounts of tellurium or selenium, although usually colorless, develop a reddish or brownish black tint according to whether selenium or tellurium is present, owing to the reduction of their respective compounds. Further investigation showed that with selenium this might occur through the action of the medium but with potassium tellurite on all the ordinary culture media (broth or agar, with glucose or with glycerin) there was never any reaction in the absence of bacterial life. This was therefore put into practice in the case of lecithin preparations, vaccines and opotherapeutic products, since it is impossible to be sure, by the ordinary methods, that, for example, every ampul in a batch is sterile. In the presence of potassium tellurite a brown color shows definitely the growth of bacteria and the development of no color shows that the preparation is safe. This test has been in use for 25 years with invariable success, and it has the great advantage that the patient or the doctor can see at once if the preparation is unfit for use.—NEPPI *Therapia* (Dec 1934), through *Quart J Pharm Pharmacol*, 8 (1935), 289 (S W G)

Tetanus Antitoxin—Persistence of, in Man In a group of twelve persons, the tetanus antitoxin level, persisting two years after a primary series of three doses of tetanus toxoid, did not fall appreciably during the last year. A secondary stimulus of 1 cc of toxoid given to these persons within a week effected a definite increase *in titre*, which persisted at significantly high levels after a month. Antitoxin titres similarly attained in a previous group are shown to persist after a year at or above the level of 0.1 unit per cc of serum in nine of the total group of ten persons.—P A T SNEATH and E J KERSLAKE *Brit Med J*, 3893 (1935), 290 (W H H)

Typhoid Fever Vaccine—Effectiveness of, in Control of Typhoid Fever Analysis of the incidence of typhoid fever for several years, in the army, navy and several communities compared with the incidence of typhoid vaccination has shown that typhoid vaccine offers a very considerable protection against typhoid infection and is a useful adjunct to a sanitation program, but that it cannot be relied upon to protect against mass infection nor grossly unsanitary conditions. In the discussion following the paper, it was revealed that the vaccine given after exposure to the disease, decreases the severity and duration of the infection, and that the tendency is away from mixed vaccines. Paratyphoid A does not occur in the U S and paratyphoid is a relatively mild infection so that there is no advantage in the use of combined paratyphoid A and B and typhoid vaccine.—R W TODD *New Orleans M and S J* 88 (1935), 30, through *Squibb Abstr Bull*, 8 (1935), A-1016

Whooping-Cough—Control of, with Serum and Vaccine Convalescent serum from cases of whooping cough has been used with definite benefit in the prophylaxis, but doubtful in the treatment of pertussis. A preliminary description is given of a skin test which can be used both to diagnose whooping cough in an early stage, and also to pick out those children who are susceptible to the disease. The pertussis skin test is further evidence that children can be immunized against whooping-cough by the giving of a suitable vaccine. Children who give a negative skin test can be made to give a positive skin test by the injection of the vaccine.—D PATERSON R H BAILEY and R G WALLER *Lancet*, 49 (1935), 361 (W H H)

BOTANY

Anthracene Oils Used for the Defence of Crops A general discussion of the physical and chemical characteristics of anthracenic tar oils, of their insecticidal action and of their possible harmful action on plants.—M RAUCOURT *14me Congrès de Chimie Industrielle, Paris*, Oct 21-27 1934, 6 pp (A P-C)

Brazilian Flora—Mydriatics and Myotics from Various native plant drugs are enumerated and described for both external and internal application.—F W FREISE *Suddeut Apoth-Zig*, 75 (1935), 333, through *Chem Abstr*, 29 (1935), 4519

Cinchona Plant in Russia According to some authors *Cinchona succirubra* at an age of two and a half years contains 4.083% and at an age of 3 years 4.121% of quinine. According to other authors *Cinchona ledgeriana* at an age of 1 year contains 2.18% of quinine and 2.64% of other alkaloids, at an age of one and a half years it contains 4.49% of quinine and at an age of 2 years 5.15% of quinine. Some authors have stated that the quinine content of very young plants may be equal to 6%. A series of experiments was carried out in various regions of Southern Russia with various types of cinchona and the quinine content obtained from these plants gave an average

of about 2% of quinine. On the basis of the results obtained the author hesitates to state whether the culture of cinchona in Russia is justified.—G K KIRK *Soviet Pharm* 3 (1935) 19

(A S)

Digitalis—Proportion of Digoxin in Digitalis was cultivated at Valperga and gave plants of medium size, the second year leaves averaging 25 cm by 7 to 10 cm. When sections were treated under the microscope with a mixture of one drop of picric acid solution and one drop of 10% sodium hydroxide, in two minutes the orange color developed by the cells containing the glycosides could be observed. A quantity of liquid extract was prepared according to the Italian Pharm and the digoxin was estimated by the method therein described. It contained 0.22% the Pharm requirement being 0.20%.—I BERTONASCO *Boll chim farm* 74 (1935), 114 through *Quart J Pharm Pharmacol* 5 (1935) 255

(S W G)

Sandal Spike Disease of A review of a series of transmission experiments carried out with the insect fauna associated with healthy and spiked sandal plants. These experiments were carried out since 1931 and new ones are still in progress.—ANON *Perfumery Essent Oil Record* 26 (1935) 305

(A C DeD)

Vermifuge Grains of the Combretaceæ of Madagascar A botanic history and a botanic and histologic description of the leaves and fruit of *Ousqualis indica* L. are given.—L MAHER and R WHITE *Bull sci pharmacol* 12 (1935) 202

(C T I)

Ylang Oils—Classification of Commercial The botanic source of ylang ylang oil and of its poor relation cuming oil is *Cananga odorata*, a tree which is widely cultivated in certain parts of tropical Asia. The tree attains a height of 60 feet or more. Of recent years the French growers in Reunion have introduced the practice of stopping the growth to produce a smaller tree from which the flowers can be more easily picked. It is propagated by seedlings. Growth is rapid and by the third year a crop of the beautifully perfumed yellowish green flowers is obtained. These flowers must be allowed to ripen to a full yellow color to develop their full fragrance before being picked. This may take 20 days. Commercially the oils from *Cananga odorata* fall into three main types: Manila ylang, Bourbon ylang and cuming. Each oil is discussed.—F ATKINS *Perfumery Essent Oil Record* 26 (1935) 251

(A C DeD)

CHEMISTRY

GENERAL AND PHYSICAL

Aluminum Subacetate—Molecular Solubility of The literature shows great disagreement on the question of the kind of solution formed by aluminum subacetate. Some hold it forms true solutions, others insist that colloidal solutions are formed. From conductivity and freezing point depression measurements the author concludes that aluminum diacetate forms a true and not a colloidal solution.—C ROHMANN *Pharm Ztg* 80 (1935) 493

(G E C)

Glass Electrode—Measurements with the The method of potential measurement employing the glass electrode are reviewed. The types of these electrodes and the various factors influencing the accuracy of determination are discussed. The theories of the glass electrode are considered. Use of the Lindemann electrometer as a null instrument in a compensating circuit is recommended.—G KILDI *Dansk Tidsskr Farm*, 9 (1935) 129

(C S L)

INORGANIC

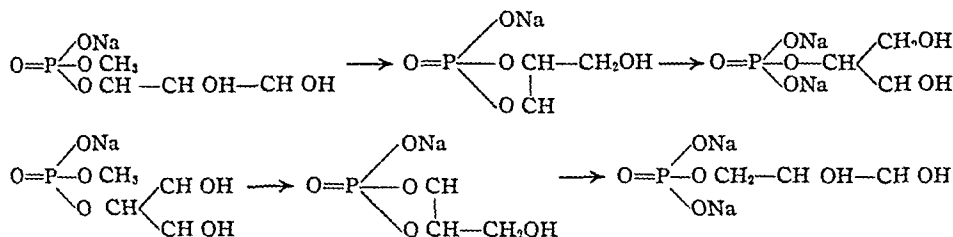
Heavy Water—Research on the Content of, in Mineral Waters A series of mineral waters from different medical sources was analyzed. The samples were carefully distilled, and their refractive indices determined to check their purity. The examinations showed that the heavy water content did not differ from that of ordinary water.—K HANSEN, E RUSTUNG and J HVED INC *J pharm chim*, 21 (1935), 538

(M M Z)

Hydrogen Peroxide—Decomposition of, in Presence of Glass Wool and Copper Sulphate The decomposition of a solution of pure hydrogen peroxide in water, filtered free from all dust particles into perfectly dust free quartz containers is extremely slow, even appreciably alkaline solutions of the order of pH 9. The addition of glass wool increases the rate of decomposition which does not further increase on addition of more glass wool. Copper is adsorbed from dilute solutions of copper sulphate by glass wool, which becomes a greenish color, and the addition of this coppered wool greatly increases the rate of decomposition of hydrogen peroxide. The author gives

figures for the distribution of copper between copper sulphate and glass wool, and states that the decomposition of hydrogen peroxide in the presence of glass wool is a reaction of the first order, whereas that with coppered glass wool is of zero order —K C BAILEY *Sci Proc Roy Dub Soc*, 21 (1935), 153, through *Quart J Pharm Pharmacol*, 8 (1935), 260 (S W G)

Orthophosphoric Acid—Migration Phenomena in the Course of Hydrolysis of the Three Mixed Di-esters Shifting of the α and β Glycerophosphates The difference in yields ($\frac{2}{3}$ and $\frac{1}{3}$, respectively) of the two transpositions which accompany the hydrolysis of the isomeric -methyl and methyl glycerophosphates according to the equation



is explained as follows Although in both cases the same di ester $\alpha \beta$ monoglycerophosphate is formed, it may be formed more readily in the first than in the second case because of a more favorable spatial arrangement —OCTAVE BAILEY and J GAUMÈ *J pharm chim*, 22 (1935), 23–32 (S W G)

Silver-Mercury Complex A solution was prepared containing 10 Gm of silver nitrate, 100 cc distilled water 20 cc nitric acid (d 1.334) and this was added to 200 cc of an aqueous solution containing 15 Gm of mercuric cyanide in 200 cc of distilled water The precipitate formed was filtered washed and dried A study of this compound indicated that it was a complex type Two molecules of water of hydration are retained regardless of the solvent used while both silver nitrate and mercuric cyanide are anhydrous salts The complex is insoluble in ether, yet mercuric cyanide is soluble On addition of sodium hydroxide, there is first obtained a white precipitate (silver cyanide), then a yellow precipitate (basic nitrate of mercury), while silver nitrate alone yields a brown precipitate —J BOUGAULT and E CATTELAINE *J pharm chim*, 21 (1935), 581 (M M Z)

Sodium Perborate—Note on Official perborate of soda being $\text{NaBO}_3 \cdot 4\text{H}_2\text{O}$ should be a definite chemical substance However a difference has been shown to exist between samples prepared by a French company and those of a Swiss company The Swiss perborate on solution produces a perfectly clear solution, whereas the French perborate gives a solution containing a light flocculent precipitate which eventually settles out Titration of the available oxygen showed no appreciable difference in the two samples Temperature caused both solutions to deteriorate, the French sample being more stable The Swiss perborate under the microscope showed small clear crystals, the French showed opalescent crystals —A MIRIMANOFF *Pharm Acta Helv* 10 (1935) 122 (M F W D)

ORGANIC

Alkaloids

Cinchona Alkaloids—Modified Part II The action of sulphuric acid on quinine and quinidine is reported Two distinct groups of products were obtained apo bases (demethylated or phenolic bases) and isomerides of quinine and quinidine (undemethylated bases) In addition to apoquinine (previously reported), two other bases were obtained *isoapoquinine* [m p 275° , (α) $_{\text{D}}^{15}$ -261.7° ($c = M/40$ in alcohol)] and *hydroxydihydroapoquinine* [m p $281\text{--}284^\circ$ (α) $_{\text{D}}^{15}$ -205.4° ($c = M/40$ in $N/10$ sulphuric acid)] The former was obtained in the mother liquors of the acid sulphate obtained in the process of purification of apoquinine The latter is produced when pure apoquinine is boiled with 60% sulphuric acid From quinidine, in addition to *l*-iso apoquinidine (previously reported), the authors obtained *apoquinidine* [m p 172° (α) $_{\text{D}}$ $+208.6^\circ$ ($c = 1$ in alcohol)] and a third isomeride provisionally named *base A* No hydroxydihydroapoquinidine analogues with the apoquinine product were isolated The undemethylated bases recovered from quinine so far yielded only one crystalline product [m p $183\text{--}185^\circ$ (α) $_{\text{D}}^{15}$ -201.9° ($c = 0.811$ in alcohol)] identical with apoquinine methyl ether (previously reported) and beta

of about 2% of quinine. On the basis of the results obtained the author hesitates to state whether the culture of cinchona in Russia is justified —G K KRIER *Soviets Pharm* 3 (1935), 19

(A S)

Digitalis—Proportion of Digitoxin in Digitalis was cultivated at Valperga and gave plants of medium size, the second-year leaves averaging 25 cm by 7 to 10 cm. When sections were treated under the microscope with a mixture of one drop of picric acid solution and one drop of 10% sodium hydroxide, in two minutes the orange color developed by the cells containing the glycosides could be observed. A quantity of liquid extract was prepared according to the Italian Phar and the digitoxin was estimated by the method therein described. It contained 0.22% the Phar requirement being 0.20% —E BERTONASCO *Boll chim-farm*, 74 (1935) 114 through *Quart J Pharm Pharmacol* 8 (1935) 285

(S W G)

Sandal—Spike Disease of A review of a series of transmission experiments carried out with the insect fauna associated with healthy and spiked sandal plants. These experiments were carried out since 1931 and new ones are still in progress —ANON *Perfumery Essent Oil Record*, 26 (1935) 305

(A C DeD)

Vermifuge Grains of the Combretaceæ of Madagascar A botanic history and a botanic and histologic description of the leaves and fruit of *Quisqualis indica* L. are given —L MAHEN and R WEITZ *Bull sci pharmacol* 42 (1935) 202

(C T I)

Ylang Oils—Classification of Commercial The botanic source of ylang ylang oil and of its poor relation cananga oil is *Cananga odorata* a tree which is widely cultivated in certain parts of tropical Asia. The tree attains a height of 60 feet or more. Of recent years the French growers in Reunion have introduced the practice of stopping the growth to produce a smaller tree from which the flowers can be more easily picked. It is propagated by seedlings. Growth is rapid and by the third year a crop of the beautifully perfumed yellowish green flowers is obtained. These flowers must be allowed to ripen to a full yellow color to develop their full fragrance before being picked. This may take 20 days. Commercially the oils from *Cananga odorata* fall into three main types: Manila ylang, Bourbon ylang and cananga. Each oil is discussed —F ATKINS *Perfumery Essent Oil Record* 26 (1935), 251

(A C DeD)

CHEMISTRY

GENERAL AND PHYSICAL

Aluminum Subacetate—Molecular Solubility of The literature shows great disagreement on the question of the kind of solution formed by aluminum subacetate. Some hold it forms true solutions, others insist that colloidal solutions are formed. From conductivity and freezing point depression measurements the author concludes that aluminum diacetate forms a true and not a colloidal solution —C ROHMANN *Pharm Ztg*, 80 (1935) 493

(G E C)

Glass Electrode—Measurements with the The method of potential measurement employing the glass electrode are reviewed. The types of these electrodes and the various factors influencing the accuracy of determination are discussed. The theories of the glass electrode are considered. Use of the Lindemann electrometer as a null instrument in a compensating circuit is recommended —G KILDE *Dansk Tidsskr Farm*, 9 (1935) 129

(C S L)

INORGANIC

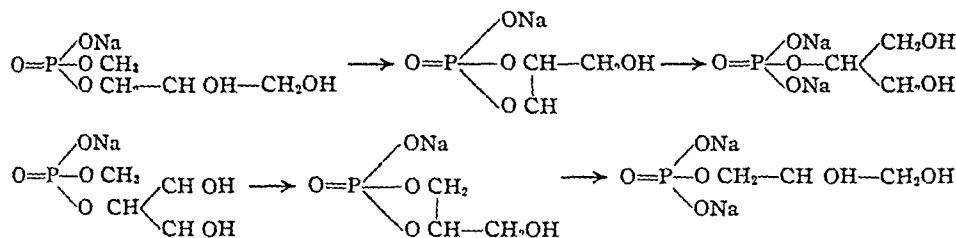
Heavy Water—Research on the Content of, in Mineral Waters A series of mineral waters from different medical sources was analyzed. The samples were carefully distilled, and their refractive indices determined to check their purity. The examinations showed that the heavy water content did not differ from that of ordinary water —K HANSEN, E RUSTUNG and J HVEDING *J pharm chim*, 21 (1935) 538

(M M Z)

Hydrogen Peroxide—Decomposition of, in Presence of Glass Wool and Copper Sulphate The decomposition of a solution of pure hydrogen peroxide in water filtered free from all dust particles into perfectly dust-free quartz containers is extremely slow, even appreciably alkaline solutions of the order of pH 9. The addition of glass wool increases the rate of decomposition which does not further increase on addition of more glass wool. Copper is adsorbed from dilute solutions of copper sulphate by glass wool which becomes a greenish color, and the addition of this coppered wool greatly increases the rate of decomposition of hydrogen peroxide. The author gives

figures for the distribution of copper between copper sulphate and glass wool, and states that the decomposition of hydrogen peroxide in the presence of glass wool is a reaction of the first order, whereas that with coppered glass wool is of zero order —K C BAILEY *Sci Proc Roy Dub Soc*, 21 (1935), 153, through *Quart J Pharm Pharmacol*, 8 (1935), 260 (S W G)

Orthophosphoric Acid—Migration Phenomena in the Course of Hydrolysis of the Three Mixed Di-esters Shifting of the α and β Glycerophosphates The difference in yields ($2/3$ and $1/3$, respectively) of the two transpositions which accompany the hydrolysis of the isomeric methyl and methyl glycerophosphates according to the equation



is explained as follows Although in both cases the same di ester α - β -monoglycerophosphate is formed, it may be formed more readily in the first than in the second case because of a more favorable spatial arrangement —OCTAVE BAILEY and J GAUMÉ *J pharm chim*, 22 (1935), 23-32 (S W G)

Silver-Mercury Complex A solution was prepared containing 10 Gm of silver nitrate, 100 cc distilled water 20 cc nitric acid (d 1.334) and this was added to 200 cc of an aqueous solution containing 15 Gm of mercuric cyanide in 200 cc of distilled water The precipitate formed was filtered washed and dried A study of this compound indicated that it was a complex type Two molecules of water of hydration are retained regardless of the solvent used, while both silver nitrate and mercuric cyanide are anhydrous salts The complex is insoluble in ether, yet mercuric cyanide is soluble On addition of sodium hydroxide there is first obtained a white precipitate (silver cyanide), then a yellow precipitate (basic nitrate of mercury), while silver nitrate alone yields a brown precipitate —J BOUGAULT and E CATTELAÏN *J pharm chim* 21 (1935), 581 (M M Z)

Sodium Perborate—Note on Official perborate of soda being $\text{NaBO}_3 \cdot 4\text{H}_2\text{O}$ should be a definite chemical substance However a difference has been shown to exist between samples prepared by a French company and those of a Swiss company The Swiss perborate on solution produces a perfectly clear solution whereas the French perborate gives a solution containing a light flocculent precipitate which eventually settles out Titration of the available oxygen showed no appreciable difference in the two samples Temperature caused both solutions to deteriorate, the French sample being more stable The Swiss perborate under the microscope showed small clear crystals, the French showed opalescent crystals —A MIRIMANOFF *Pharm Acta Helv*, 10 (1935), 122 (M F W D)

ORGANIC

Alkaloids

Cinchona Alkaloids—Modified Part II The action of sulphuric acid on quinine and quinidine is reported Two distinct groups of products were obtained apo bases (demethylated or phenolic bases) and isomerides of quinine and quinidine (undemethylated bases) In addition to apoquinine (previously reported), two other bases were obtained *isoapoquinine* [m p 275° (α)_D¹⁵ -261.7° ($c = M/40$ in alcohol)] and *hydroxydihydroapoquinine* [m p $281-284^\circ$ (α)_D¹⁵ -205.4° ($c = M/40$ in $N/10$ sulphuric acid)] The former was obtained in the mother liquors of the acid sulphate obtained in the process of purification of apoquinine The latter is produced when pure apoquinine is boiled with 60% sulphuric acid From quinidine in addition to *isoapoquinine* (previously reported), the authors obtained *apoquinidine* [m p 172° (α)_D $+208.6^\circ$ ($c = 1$ in alcohol)] and a third isomeride provisionally named *base A* No hydroxydihydroapoquinidine analogues with the apoquinine product were isolated The undemethylated bases recovered from quinine so far yielded only one crystalline product [m p $183-185^\circ$, (α)_D¹⁵ -201.9° ($c = 0.811$ in alcohol)] identical with apoquinine methyl ether (previously reported) and beta

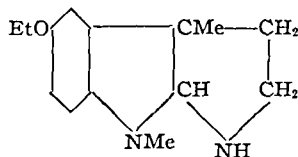
isoquinine of Suszko From quinidine, *beta*-isoquinidine [$m p 142^{\circ} (\alpha)_D^{17} -9.7 (c = 1.4224 \text{ in alcohol})$] which was shown to be isoapoquinidine methyl ether, methyl ether of the new apoquinidine [$m p 181^{\circ}$ —anhydrous crystals from ether $90-100^{\circ}$ —monohydrate in rhombic plates from aqueous acetone, $(\alpha)_D^{15} +193.2^{\circ} (c = 0.7815 \text{ in alcohol})$, the hydrochloride has $m p$ of 267° and $(\alpha)_D^{15} +174.7^{\circ} (c = 0.902 \text{ in water})$] The latter differed from *alpha*-isoquinidine of Doman ski and Suszko, particularly in specific rotation A possible third and dextro rotatory isomeride of quinidine was obtained in small yields —T A HENRY W SOLOMON and E M GIBBS *J Chem Soc* (1935) 966-971 (G W F)

Ergot—Active Principles of In experiments involving the use of pregnant cats, the available salts of ergotamine and ergotamine were found to fall far short of being carriers of the full oxytocic activity of ergot The activity of crude pharmacopœial extracts of the drug is far more prompt and intense, and entirely out of proportion to the alkaloidal equivalents of such extracts when calculated in terms of ergotoxine or ergotamine, thus indicating the existence of a very important hitherto unidentified source of activity This important activity is shown to reside in the 'total specific alkaloidal fraction' of the drug Removal of the hitherto known alkaloids from this fraction left the greater part of the oxytocic activity behind The new and more important oxytocic substance was isolated and found to be similar in certain fundamental respects to ergotoxine and ergotamine differing mainly in being much more soluble and absorbable than the well known ergot alkaloids Because of its chemical and pharmacological properties, the newly isolated substance was temporarily designated as 'X alkaloid' Its relationship to the results obtained by currently used methods of bioassay received appropriate consideration —MARVIN R THOMPSON *J Pharmacol*, 54 (1935) 161 (H B H)

Ergot—Chemistry and Pharmacology of A review —K W MERZ *Apoth Ztg*, 50 (1935), 472-474, 493-497 (H M B)

Peyote—Alkaloids of The powdered 'mescal buttons' are extracted with 70% alcohol the solvent is evaporated under vacuum, the alkaloids in the residue are liberated by addition of ammonia and extracted first with ether and then with chloroform the solvents are evaporated and the residue is dissolved in water the brown strongly alkaline solution is neutralized exactly with sulphuric acid the precipitated resins are filtered out the filtrate is concentrated and the crystals obtained, consisting of sulphates of mescaline and anhalonidine, are decolorized by bone char, the filtrate is treated with barium chloride and filtered and anhalonine hydrochloride crystallizes in the filtrate The latter is treated with an alcoholic solution of chloride of mercury, the chloromercurate which separates is recrystallized, decomposed by hydrogen sulphide and filtered, the solution is extracted with ether the extract is neutralized with hydrochloric acid, concentrated in vacuum and the oily mass which separates soon crystallizes It consists of the hydrochlorides of peyotline anhalonine and lophophorine which are separated by fractional crystallization —G TOMASO *La Chimica*, 10 (1934) 408-416, through *Chimie et Industrie*, 34 (1935) 138 (A P C)

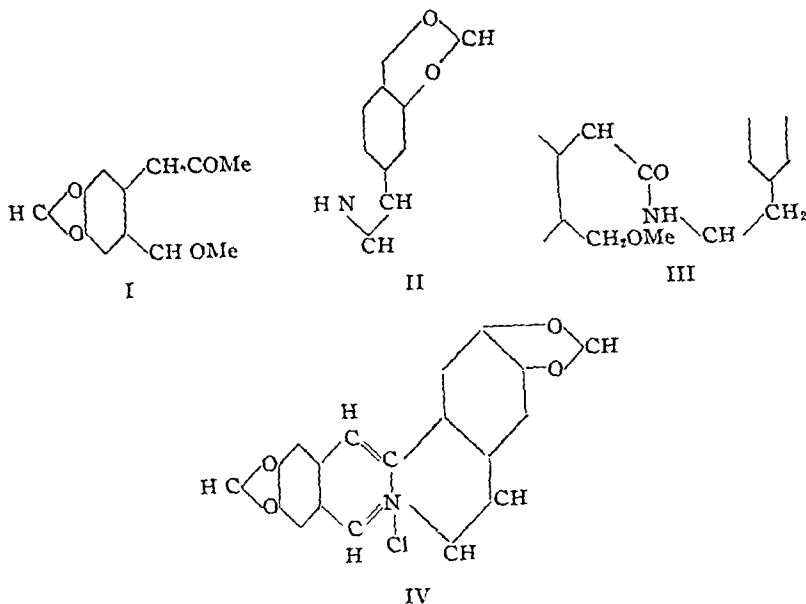
Physostigmine (Eserine)—Experiments on the Synthesis of Part XI The later phases of synthetical investigations are described One of the more promising methods of synthesizing eserine is *dl*-noreserethole \rightarrow *l*-noreserethole \rightarrow *l*-eseretholemetho salt \rightarrow *l*-eserethole \rightarrow *l*-eseroline \rightarrow eserine *dl*-Noreserethole on controlled methylation with methyl *p*-toluenesulphonate, yielded crystalline *dl*-eserethole ($m p 79-80^{\circ}$) It was found that this was identical with product of Hoshino and Kobayashi by direct comparison of specimens The latter authors described their base as $C_{16}H_{21}ON_2$ while King and Robinson found it to be $C_{16}H_{22}ON_2$



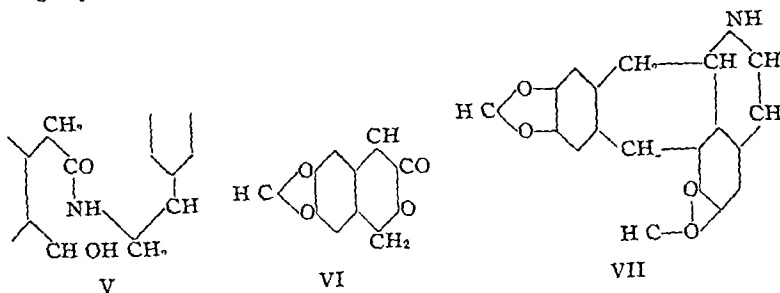
FREDERICK E KING and ROBERT ROBINSON *J Chem Soc* (1935), 755-759 (G W F)

Protopine and Allied Alkaloids—Synthetic Experiments on Part II A new synthesis of the berberine ring system and of a ring homologue of the apomorphine alkaloids is reported This is more simple but less flexible than any synthesis previously described I and II are reacted to form

III Thus, when treated with phosphorus pentachloride, produces double ring closure with elimination of water and methyl alcohol and simultaneous dehydrogenation to yield 25% of a berberine analogue (IV)



The compound V, prepared from VI and VII, when treated with POCl_3 produced upon reduction, the substance VIII containing the apomorphine skeleton modified by the presence of an extra methylene group in the central ring



THOMAS S STEVENS *J Chem Soc*, (1935) 663-667

(G W F)

Quinine, Quinidine, Cinchonine and Cinchonidine—Specific Rotatory Power of the Salts of Addition of hydrochloric acid to these bases forming first the mono- then the dihydrochlorides shows a progressive increase in rotatory power which can be explained on the basis of the ionization of the salts. There are four asymmetric carbons in these bases. It is concluded that quinine and quinidine are epimeric and are identical on carbons 1 and 2 but are optically inverse on carbons 3 and 4. Cinchonine and cinchonidine are identical on 1, 2 and 4 but different on 3. Sterically the methoxyl and the vinyl chains of quinine and cinchonidine can be represented as parallel and in the same direction, while the chains of quinidine and cinchonine are parallel but in the opposite direction. This explains the high antimicrobial activity of quinine, the different properties of the four alkaloids and the well known influence of the modification of the lateral chains on the pharmacodynamic properties.—CHARLES LAPP *Compt rend*, 201 (1935) 80 (G W H)

Strychnine and Brucine Part XXXIII Methoxymethylchanodihydrostrychnanic acid was found to be resistant to facile dehydrogenation. Likewise methoxymethylchanodihydro-

strychnone was found to be resistant. These reactions indicate the veracity of the formula previously reported for methoxymethylidihydroneostrychnine—T M REYNOLDS and ROBERT ROBINSON *J Chem Soc* (1935), 935-940 (G W F)

Yohimbine—An investigated commercial yohimbine consisted principally of a base having the same melting point and optical rotation as *iso* yohimbine. The yobyryne which Mendlik and Wibant obtained by dehydrogenation of yohimbine (*Rec des Trav Chim des Pays Bas*, 50 (1935), 91) has the formula $C_{19}H_{16}N_2$ and is identical with that obtained by Barger and Scholz (*Helv Chim Acta*, 16 (1933), 1343). Catalytic hydrogenation of yobyryne $C_{19}H_{16}N$ yields decahydro yobyryne $C_{19}H_{24}N_2$, whereas tetrahydroyobyryne $C_{19}H_{20}N_2$ yields octahydroyobyryne $C_{19}H_{24}N$ —H P WIBANT and A H P VAN GASKE *Rec des Trav Chim des Pays Bas* 54 (1935) 85, through *Pharm Zentralh* 76 (1935) 460 (E V S)

Essential Oils and Related Products

Abies Sibirica—Composition of Ethereal Oil of. The work is summarized by the author as follows. 1 The ethereal oil of *Abies sibirica* studied was found to correspond by its physico chemical properties to the average norms and was found to contain up to 32% of borneol in form of borneol acetate. 2 Besides borneol this oil contained santene, *l* alpha pinene, *l* beta pinene, camphene, *l* alpha phellandrene and dipentene. All these compounds are found in amounts har monizing with the corresponding fractions. 3 In the third fraction of the carbohydrate portion of the oil of *Abies sibirica* there is apparently found an unknown carbohydrate. This carbohydrate was nitrated and this nitrated product was found to possess different properties than the nitrated products of the other carbohydrates of this oil—V V WILLIAMS and A S ONISCHENKO *Soviets Pharm* 2 (1935) 15 (A S)

Aromatics—Noteworthy New Special. A review—B REGRUB *Riechstoff Ind Kos metik* 10 (1935), 79-83 (H M B)

Estragon and Hyssop—A Survey of Production and Characteristics of. A review of the cultivation, distillation and chemistry of the oils. The constants for oil of estragon (*Artemisia dracuncululus* L.) were found to be spec grav at 15° 0.926-0.966, optical rotation + 3°20' to +4°12', refractive index at 20° 1.5112-1.5201, saponification value 2.8-17.7. The constants for oil of hyssop (*Hyssopus officinalis* L.) were found to be spec grav at 15° 0.940-0.956, optical rotation -16°18' to -18°20', saponification value 4.7-12.1, refractive index at 20° 1.4800-1.4829, ketone content (*l* pinocamphone) was about 45%—ERNEST S GUENTHER *Am Per fumer* 30 (1935) 238-240 (G W F)

Gamboge—Contribution to the Chemistry of. The author investigated the gum resins from various trees of the Family *Garcinia*, especially *Garcinia Hanburyi*, attempting to isolate the active constituents. The material was extracted with ether, the resinous portion being obtained as a slimy residue. Attempts at separation with various solvents gave no crystalline products. Separation with dilute soda solutions and alkalis gave three fractions. In soda 84% of the pure resin (mostly acids) went into combination. Alkali took up 12% of apparently phenolic compounds. The balance consisted of an ester which was separated into an alkali soluble and an alkali insoluble portion upon saponification. All resin constituents are yellow in color, the acid constituents dissolve in alkali with a yellow color, the phenolic constituents with a red color. The soda soluble portion when treated with acetic acid and sodium acetate gives prisms or triangular plates (yellow) of acetyl α cambogic acid which liquefy at 163° and are completely melted at 190°. The acid has the formula $C_{31}H_{36}O_7$ and appears to be unsaturated. After splitting off the acetyl group the α cambogic acid shows the formula $C_{25}H_{30}O_7$.

This can also be ident

fied in the resin. In the alkali soluble portion the investigation for esters was fruitless and in the third fraction only one ester was found of which the products of hydrolysis could not be identified. The laxative properties of acetyl α cambogic acid determined with mice and compared with that of the total resin as well as that of the gum resin showed the latter to have the strongest action. The gum portion evidently increasing the laxative properties of the resin—MARTHA FURRER (Dissertation, Basel) *Pharm Zig* 79 (1934), 1082 through *Pharm Weekblad* 72 (1935) 828 (E H W)

Leaf Oils of the Washington Conifers VII *Juniperus Occidentalis*. This tree grows in

northwestern United States, seldom at elevations of less than 6,000 feet. Steam distillation of leaves and branches yielded 0.36% of oil. Aldehydes, ketones and primary alcohols were absent or nearly so. Composition was found to be about as follows: bornyl acetate, 40, borneol, 11, alpha phellandrene, cymene and probably camphene, 35, acetic acid 0.2, phenols, 0.5, compounds of higher boiling point and loss, 14.—E. V. LANN and LOUIS FISCHER. *J. Am. Pharm. Assoc.*, 14 (1935), 613 (Z. M. C.)

Oil of Citronella. The following comparative figures are given for the production of oil of citronella:

Year	Netherlands Indies (Mostly from Java)	Ceylon
1929	879 tons	532 tons
1930	818 tons	546 tons
1931	893 tons	542 tons
1932	996 tons	576 tons
1933	1529 tons	657 tons
1934	1783 tons	692 tons

The author calls attention to the differences between East Indian and Ceylon citronella oil. Java oil has a lower specific gravity and a higher citronellal and total geraniol content than the Ceylon oil. A great deal of the Ceylon oil is adulterated. The author recommends that oil of citronella be included in the Netherlands Phar.—P. A. ROWAAN. *Pharm. Weekblad*, 72 (1935), 853 (E. H. W.)

Oil of Myrtle—Survey of. A review of the botany, cultivation, constants and chemistry of oil of myrtle (*Myrtus communis* L.)—ERNEST S. GUENTHER. *Am. Perfumer*, 30 (1935), 287–288 (G. W. F.)

Photochemical Notes. No. 113. An Unusual Peppermint Oil. Report is made of a sample of peppermint oil distilled in 1930. In a little more than a year it had acquired a distinct orange tint, was cloudy and had a resinous sediment. Physical and chemical constants were determined for crude oil, rectified oil and first cohobate. Because density (0.962, 0.9145 and 0.9179) varied from official oil (0.896 to 0.908) the opinion of others was sought. The A. M. Todd Company asked for a sample and reported findings. These are tabulated with U. S. P. requirements for easy comparison. Comments are quoted. Fritzsche Brothers submitted two opinions and both are quoted. A sample of the rectified oil was saponified and the saponified oil distilled with steam and collected in fractions. Redistillation showed that three larger fractions had densities greater than U. S. P. limit. Fraction 200° to 220° placed in a freezing mixture yielded menthol and acetylation revealed 97.8% alcohol computed as menthol. There was no thymol or carvacrol or pulegone. The only thing that can be done with such an oil under present U. S. P. standard is to blend it with other oils that are relatively light.—SISTER M. FRANCIS XAVIER. *J. Am. Pharm. Assoc.*, 24 (1935), 543 (Z. M. C.)

Salvia Sclarea—Accumulation of Ethereal Oil in, of Central Asia. *Salvia Sclarea* belonging to the family of Labiatae is a plant which lives a few years and which is found in a wild state. Because of its ethereal oil content it is at present cultivated in France, Italy and to some extent in Germany, Russia and other countries. The ethereal oil consists of linalol combined in form of acetic and formic ethers, of free linalol and of slight amounts of a free acid and a substance having a carbonyl group. It has been found that the chemical make up of this ethereal oil is dependent on the climatic conditions, on the stage of development of the plant, on the method of collection of the plant, and on the method of its dry distillation. The author attempted to determine the relation of the chemical make up of the ethereal oil to the stage of development of the plant, its age and type, under conditions found in Central Asia. Experiments were carried out in Samarkand where the plants of 1, 2 and 3 years of age were studied. The plants were grown from seeds collected of wild plants, and represented a mixture of about 7 types. The results obtained have shown that the main mass of the ethereal oils accumulates in the flowers and the region neighboring immediately upon them, and only a negligible amount of these oils is found in the remaining parts of the plant. The total amount of the ethereal oil is dependent on the state of development, type and age of the plants. The maximum amount of ethereal oil was found in plants two years of age at the end of blooming, while the minimal amount is found in plants three years of age during the first period of their development.—T. K. GAPONENKOV. *Soviets Pharm.*, 4 (1935), 31 (A. S.)

Stone Fruit Flavors Stone fruits (genus *Prunus*) are subjected to hydraulic pressure in the cold, concentrated *in vacuo* and preserved with sugar or alcohol. The extracts may be fortified with synthetics. For peach essence, the following may be used: gamma-undecalactone, acetaldehyde, ethyl acetate, butyrate and valerate, iso amyl acetate and butyrate, vanillin, anisaldehyde, sweet orange oil, cardamom oil, neroli oil and benzaldehyde or bitter almond oil. S A P. The latter may be obtained from the kernels by maceration and steam distillation. Synthetics used for peach are also applicable to other stone fruits with the exception of γ -undecalactone. Ethyl butyrate and isoamyl butyrate are suggestive of apricots, ethyl acetate and benzoate as well as isoamyl formate and ethyl cœnanthate are used in cherry essences. The latter two and a trace of oil of clove are used for plum.—H. STANLEY REDGROVE. *Am Perfumer*, 30 (1935), 285-310.

(G W F)

Terpenes—Recent Progress in the Chemistry of A review with references.—J. L. SIMONSEN. *J Chem Soc* (1935), 781-785.

(G W F)

Trachyspermum Copticum Linc—Accumulation of Thymol in 1. The amount of etheral oil which may be obtained from *Trachyspermum copticum* Linc is dependent on the stage of development of the latter: the maximum amount is obtained in the most mature and the minimum in the least mature plants. 2. The etheral oil accumulates chiefly in the upper portions of the plant, if the latter is represented by 100% the amount found in the middle portion of the plant is equal to 30.6% and that in the lower portion of the plant to 10.5%. 3. The etheral oils obtained in this manner contain among the phenols chiefly thymol and a limited amount of carvacrol. 4. The phenol content and consequently the thymol content in the etheral oil depends on the state of development of the plant. 5. The thymol can be obtained not only from the oil expressed from the seeds, but also from the juice expressed from the entire plant.—T. K. GAPONENKOV. *Soviets Pharm*, 3 (1935), 17.

(A S)

Violet Odor—Natural A continuation of the work which appeared in *Perfumery Essential Oil Record*, 26 (1935) 100 is given. Violet leaf oil, ionone and irone are discussed.—F. K. DONOVAN. *Perfumery Essential Oil Record*, 26 (1935) 303.

(A C DeD)

Fixed Oils, Fats and Waxes

Carqueja (*Baccharis Genistelloides* Pers.)—Contribution to the Study of a Medicinal Plant of Widespread Use in Argentina The resin of carqueja has an acid value of 116, saponification value of 182, ester value of 66 and an iodine number (Hubl) of 74.93. The Phar of Brazil uses carqueja alone and in combination with other plants for its stimulation of the biliary function and the activity of the liver.—C. CROCCO and H. BASSO DASTUGUE. *Ann Farm Bioquim* 5 (1934) 51-60, through *Chimie et Industrie*, 33 (1935) 918.

(W A P)

Castor Oil—Refining A brief review of work carried out during the past few years on the refining of pharmaceutical and lubricating castor oil and more particularly of the author's process in which the pressed oil is treated with caustic soda without prefiltration, the presence of the albuminous matter favoring the separation of a coarse grained soap stock which readily settles out.—R. HEUBLUM. *Mat grasses*, 27 (1935) 10463, 10482-10483.

(A P C)

Cod Liver Oil—Medicinal, Obtained by Steam Methods **Vitamin Content** After a review of the work of Poullsson and of Schrader (*Pharm Zig*, 49 (1934) Nos 53 and 54) S concludes (1) for internal use the oil obtained by steam methods is the best since it has been shown that vitamins absorbed by the liver tissues are freed by the heat without destroying their action, (2) that a vapor of steam is necessary to remove the bad smelling free acids and (3) that oxygen in the air and not the temperatures is destructive to vitamin A. It appears likely on these grounds that there may be a loss of vitamin A when the oil is used in salves or emulsions.—E. SCHWEISZINGER. *Apoth-Ztg*, 50 (1935), 779-780.

(H M B)

Coula Edulis—Seed Oil of The physical and chemical constants and the composition of coula oil (from *Coula edulis* baillon) are given and compared with those of olive and tsuhal oils. Coula oil contains 87.1% of oleic acid and is a good source for the preparation thereof.—A. SREGER and J. VAN LOON. *Rec trav chim*, 54 (1935), 502, through *Squibb Abstr Bull*, 8 (1935), A 971.

Gossypol—Effect of, on Color of Cottonseed Oil Cotton seeds contain an oil soluble poisonous dye, gossypol (I). The effect of I on the color of cottonseed oil (II) was studied. As the concentration of I in II was quadrupled the color intensity was doubled. Heating the solu-

tions intensified the color to a maximum at 90–120° after which it decreased to a minimum at 120–150° and thereafter again increased. The amount of unchanged precipitable I decreased with increasing temperature. The color and I content of heated solutions decreased on standing, the decrease being greater for the solutions heated to lower temperatures and containing a greater initial amount of unchanged I. The changes in the color of the solutions was shown to be due mainly to the heating and only little if at all to oxidation. It appears therefore, that the color of II is largely dependent on the I content, although the other factors may play a part.—M. PODOLSKAJA *Fellchem Umschau*, 42 (1935), 96, through *Squabb Abstr Bull*, 8 (1935), A 929.

Halibut Liver Oils—Characters of The natural variations of halibut liver oils, particularly in vitamin content, are very great. These variations are partly seasonal and partly depend on the region in which the fish is caught. Therefore, it is the practice to standardize the oils for sale to a definite vitamin A content. This may be done either by mixing strong and weak halibut liver oils to give the desired vitamin content or by diluting a strong halibut liver oil with a fish liver oil such as cod liver oil, or even with a vegetable oil. It is important in laying down standards for the natural oil to be sure that the material tested is genuine halibut liver oil and nothing else, since, if any other oil is added the product cannot be described as natural halibut liver oil. When testing halibut liver oil, it is recommended that the Rosenmund-Kuhnemann pyridine dibromide method be used, since this method gives more consistent results when a high proportion of cholesterol is present.—N. EVERS and W. SMITH *Pharm J*, 134 (1935) 417 (W B B).

Pannarium Laurinum—The Highly Unsaturated Acid of the Kernels of The kernels yield 44% of a butter-like solid having a high refractive index and iodine value. An acid, crystallizing in large plates (m p 83.4°), was obtained by crystallization from petroleum ether. It becomes transformed by atmospheric oxygen (less in refrigerator) to an amorphous material. It was found to absorb 4 molecular proportions of hydrogen and upon potassium permanganate oxidation it yielded somewhat less than one molecular proportion each of azelaic and propionic acids and a quantity of oxalic acid. The formula $\text{CH}_3\text{CH}_2(\text{CH}=\text{CH})_4(\text{CH}_2)_2\text{CO}_2\text{H}$ is assigned. It is thought to be the first conjugated acid of the tetraene series to be reported from a vegetable or animal source.—E. H. FARMER and E. SONDERLAND *J Chem Soc* (1935) 759–761 (G W F).

Pannarium Macrophyllum—The Highly Unsaturated Acid of the Kernels of The oil constitutes 70% of the kernels, or 4% of the nuts. A highly unsaturated acid (m p 45.5–46.5°) was obtained by fractional crystallization from petroleum ether. Its identity with alpha elaeostearic acid was confirmed. W. B. BROWN and E. H. FARMER *J Chem Soc* (1935), 761–763 (G W F).

Sapucainha Oil—Constituents of Sapucainha oil was obtained from the seeds of the Brazilian plant *Carpotroche Brasiliensis* Endl. (*Flacourtiaceae*) and showed as constants d_{20}^{20} 0.9503, m p 22°, f p 13–15°, $[\alpha]_D^{20} +54.2^\circ$ ($c = 5$, in chloroform), acid no 17, sap no 195, iodine no 101. Saponification yielded a small quantity of phytosterol m p 121°, and crude fatty acids with constants m p 43°, $[\alpha]_D^{20} +56.4^\circ$, ($c = 0.4136$ in chloroform), acid no 214, iodine 109. Chaulmoogric acid was obtained by repeated recrystallization from 70% alcohol, m p 68°, $[\alpha]_D^{20} +62.9^\circ$, acid no 199.4, iodine no 92.9, amide m p 102° $[\alpha]_D^{15} = +61.9^\circ$, ($c = 5$ in chloroform). Hydnocarpic acid was obtained from the mother solutions of the first acid by precipitation from 90% alcohol with alcoholic lead acetate and was recovered from the lead precipitate (?). It had as constants m p 58°, $[\alpha]_D^{20} +64.5^\circ$, acid no 211.4, iodine no 97.1, amide m p 105–106°, $[\alpha]_D^{15} +61.4^\circ$.—T. KARIYONE and Y. HASEGAWA *J Pharm Soc of Japan*, 54 (1934), 28–29 (R E K).

Sarcostigma Kleinu—Oil of The bark, fruit and seed oil of *Sarcostigma kleinu* have been used in the treatment of rheumatics, leprosy, scabies, abscesses and hemorrhoids. Prolonged use however, affects the eyes and overstimulates the nervous system. In spite of the therapeutic use of the plant the chemistry of the oil has not been studied. The following constants were determined for the seed oil: solidification point 20°, $d_4^{29.5}$ 0.9274, viscosity (Engler viscosimeter) E_{20} 7.14, $[\alpha]_D^{27}$ 1.0606, n_D^{40} 1.4649–1.4651 depending on the refractometer, acid number 11.89 which is rather high and may be due to the fact that the seeds were kept for several months before extraction. Saponification number 196.6. Reichert-Meissl number 0.55, Polenske number 0.19, acetyl number 0. Hehner number 93.8–94.6, depending on the method, thiocyanate number 49.48, iodine number 69.16–72.63, depending on the method, and hexabromide number 0. The oil contained a small amount of unsaponifiable matter which gave a sterol reaction, the crystalline

Stone Fruit Flavors Stone fruits (genus *Prunus*) are subjected to hydraulic pressure in the cold, concentrated *in vacuo* and preserved with sugar or alcohol. The extracts may be fortified with synthetics. For peach essence, the following may be used: gamma undecalactone, acetaldehyde, ethyl acetate, butyrate and valerate, iso amyl acetate and butyrate, vanillin, anisaldehyde, sweet orange oil, cardamom oil, neroli oil and benzaldehyde or bitter almond oil. S. A. P. The latter may be obtained from the kernels by maceration and steam distillation. Synthetics used for peach are also applicable to other stone fruits with the exception of γ -undecalactone. Ethyl butyrate and isoamyl butyrate are suggestive of apricots, ethyl acetate and benzoate as well as iso amyl formate and ethyl cinnamate are used in cherry essences. The latter two and a trace of oil of clove are used for plum.—H. STANLEY REDGROVE, *Am Perfumer*, 30 (1935), 285, 310.

(G. W. F.)

Terpenes—Recent Progress in the Chemistry of A review with references.—J. L. SIMONSEN, *J Chem Soc* (1935), 781–785.

(G. W. F.)

Trachyspermum Copticum Linc—Accumulation of Thymol in 1. The amount of etheral oil which may be obtained from *Trachyspermum copticum* Linc is dependent on the stage of development of the latter: the maximum amount is obtained in the most mature and the minimum in the least mature plants. 2. The etheral oil accumulates chiefly in the upper portions of the plant: if the latter is represented by 100%, the amount found in the middle portion of the plant is equal to 30.6% and that in the lower portion of the plant to 10.5%. 3. The etheral oils obtained in this manner contain among the phenols chiefly thymol and a limited amount of carvacrol. 4. The phenol content and consequently the thymol content in the etheral oil depends on the state of development of the plant. 5. The thymol can be obtained not only from the oil expressed from the seeds, but also from the juice expressed from the entire plant.—T. K. GAPONENKOV, *Soviets Pharm*, 3 (1935), 17.

(A. S.)

Violet Odor—Natural A continuation of the work which appeared in *Perfumery Essential Oil Record*, 26 (1935) 100 is given. Violet leaf oil, ionone and irone are discussed.—F. K. DONOVAN, *Perfumery Essential Oil Record*, 26 (1935) 303.

(A. C. DeD.)

Fixed Oils, Fats and Waxes

Carqueja (*Baccharis Genistelloides* Pers.)—Contribution to the Study of a Medicinal Plant of Widespread Use in Argentina. The resin of carqueja has an acid value of 116, saponification value of 182, ester value of 66 and an iodine number (Hubl) of 74.93. The Phar. of Brazil uses carqueja alone and in combination with other plants for its stimulation of the biliary function and the activity of the liver.—C. CROCCO and H. BASSO DASTUGUE, *Ann Farm Broqum*, 5 (1934) 51–60, through *Chimie et Industrie*, 33 (1935) 918.

(W. A. P.)

Castor Oil—Refining A brief review of work carried out during the past few years on the refining of pharmaceutical and lubricating castor oil, and more particularly of the author's process in which the pressed oil is treated with caustic soda without prefiltration, the presence of the albuminous matter favoring the separation of a coarse grained soap stock which readily settles out.—R. HEUBLUM, *Mat grasses*, 27 (1935), 10 463, 10 482–10 483.

(A. P. C.)

Cod Liver Oil—Medicinal, Obtained by Steam Methods Vitamin Content. After a review of the work of Poulsson and of Schrader (*Pharm Ztg*, 49 (1934), Nos 53 and 54) S. concludes: (1) for internal use the oil obtained by steam methods is the best since it has been shown that vitamins absorbed by the liver tissues are freed by the heat without destroying their action, (2) that a vapor of steam is necessary to remove the bad smelling free acids and (3) that oxygen in the air and not the temperatures is destructive to vitamin A. It appears likely on these grounds that there may be a loss of vitamin A when the oil is used in salves or emulsions.—E. SCHWEISZINGER, *Apoth-Ztg* 50 (1935), 779–780.

(H. M. B.)

Coula Edulis—Seed Oil of The physical and chemical constants and the composition of coula oil (from *Coula edulis* baillon) are given and compared with those of olive and tsubaki oils. Coula oil contains 87.1% of oleic acid and is a good source for the preparation thereof.—A. STEGER and J. VAN LOON, *Rec trav chim*, 54 (1935), 502, through *Squibb Abstr Bull*, 8 (1935), A 971.

Gossypol—Effect of, on Color of Cottonseed Oil Cotton seeds contain an oil soluble poisonous dye, gossypol (I). The effect of I on the color of cottonseed oil (II) was studied. As the concentration of I in II was quadrupled, the color intensity was doubled. Heating the solu

tions intensified the color to a maximum at 90–120° after which it decreased to a minimum at 120–150° and thereafter again increased. The amount of unchanged precipitable I decreased with increasing temperature. The color and I content of heated solutions decreased on standing, the decrease being greater for the solutions heated to lower temperatures and containing a greater initial amount of unchanged I. The changes in the color of the solutions was shown to be due mainly to the heating and only little if at all to oxidation. It appears, therefore, that the color of II is largely dependent on the I content, although the other factors may play a part.—M. PODOLSKAJA, *Fellchem Umschau*, 42 (1935), 96, through *Squibb Abstr Bull*, 8 (1935) A 929.

Halibut Liver Oils—Characters of The natural variations of halibut liver oils, particularly in vitamin content, are very great. These variations are partly seasonal and partly depend on the region in which the fish is caught. Therefore, it is the practice to standardize the oils for sale to a definite vitamin A content. This may be done either by mixing strong and weak halibut liver oils to give the desired vitamin content or by diluting a strong halibut liver oil with a fish liver oil such as cod liver oil, or even with a vegetable oil. It is important in laying down standards for the natural oil to be sure that the material tested is genuine halibut liver oil and nothing else, since, if any other oil is added the product cannot be described as natural halibut liver oil. When testing halibut liver oil, it is recommended that the Rosenmund-Kühnemann pyridine dibromide method be used, since this method gives more consistent results when a high proportion of cholesterol is present.—N. EVERS and W. SMITH, *Pharm J*, 134 (1935), 417. (W. B. B.)

Parinarum Laurinum—The Highly Unsaturated Acid of the Kernels of The kernels yield 44% of a butter-like solid having a high refractive index and iodine value. An acid, crystallizing in large plates (m. p. 83.4°), was obtained by crystallization from petroleum ether. It becomes transformed by atmospheric oxygen (less in refrigerator) to an amorphous material. It was found to absorb 4 molecular proportions of hydrogen and upon potassium permanganate oxidation it yielded somewhat less than one molecular proportion each of azelaic and propionic acids and a quantity of oxalic acid. The formula $\text{CH}_3\text{CH}_2(\text{CH}=\text{CH})_4(\text{CH}_2)_7\text{CO}_2\text{H}$ is assigned. It is thought to be the first conjugated acid of the tetraene series to be reported from a vegetable or animal source.—E. H. FARMER and E. SUNDERLAND, *J. Chem. Soc.* (1935), 759–761. (G. W. F.)

Parinarum Macrophyllum—The Highly Unsaturated Acid of the Kernels of The oil constitutes 70% of the kernels, or 4% of the nuts. A highly unsaturated acid (m. p. 45.5–46.5°) was obtained by fractional crystallization from petroleum ether. Its identity with alpha-elaeostearic acid was confirmed. W. B. BROWN and E. H. FARMER, *J. Chem. Soc.* (1935), 761–763. (G. W. F.)

Sapucainha Oil—Constituents of Sapucainha oil was obtained from the seeds of the Brazilian plant *Carpotroche Brasiliensis* Endl. (*Flacourtiaceae*) and showed as constants: d_{20}^{20} 0.9503, m. p. 22°, f. p. 13–15°, $[\alpha]_D^{20} +54.2^\circ$ ($c = 5$, in chloroform), acid no. 17, saponification no. 101. Saponification yielded a small quantity of phytosterol, m. p. 121°, and crude fatty acids with constants: m. p. 43°, $[\alpha]_D^{20} +56.4^\circ$ ($c = 0.4136$, in chloroform), acid no. 214, iodine 109. Chaulmoogric acid was obtained by repeated recrystallization from 70% alcohol, m. p. 68°, $[\alpha]_D^{20} +62.9^\circ$, acid no. 199.4, iodine no. 92.9, amide, m. p. 102°, $[\alpha]_D^{15} +61.9^\circ$ ($c = 5$ in chloroform). Hydnoic acid was obtained from the mother solutions of the first acid by precipitation from 90% alcohol with alcoholic lead acetate and was recovered from the lead precipitate (?). It had as constants: m. p. 58°, $[\alpha]_D^{20} +64.5^\circ$, acid no. 211.4, iodine no. 97.1, amide m. p. 105–106°, $[\alpha]_D^{15} +61.4^\circ$.—T. KARIYONE and Y. HASEGAWA, *J. Pharm. Soc. of Japan*, 54 (1934) 28–29. (R. E. K.)

Sarcostigma Kleinu—Oil of The bark, fruit and seed oil of *Sarcostigma kleinu* have been used in the treatment of rheumatics, leprosy, scabies, abscesses and hemorrhoids. Prolonged use however affects the eyes and overstimulates the nervous system. In spite of the therapeutic use of the plant the chemistry of the oil has not been studied. The following constants were determined for the seed oil: solidification point 20°, $d_4^{29.5}$ 0.9274, viscosity (Engler viscosimeter) E₃₀ 7.14, $[\alpha]_D^{27}$ 1.0606, n_D^{40} 1.4649–1.4651 depending on the refractometer, acid number 11.89, which is rather high and may be due to the fact that the seeds were kept for several months before extraction, saponification number 196.6, Reichert-Meissl number 0.55, Polenske number 0.19, acetyl number 0, Hehner number 93.8–94.6, depending on the method, thiocyanate number 49.48, iodine number 69.16–72.63 depending on the method, and hexabromide number 0. The oil contained a small amount of unsaponifiable matter which gave a sterol reaction, the crystalline

form resembled phytosterol, the acetate melting at 132-134° —P S VARMA, N N GODBOLE and A GANGADHARAN *Fettchem Umschau*, 42 (1935), 88, through *Squibb Abstr Bull* 8 (1935) A 939

Glycosides Ferments and Carbohydrates

Adonis Vernalis—Method of Extracting Active Principles of The use of 0.5-1.0% of acetone in water instead of pure water in the usual (Hoffman-LaRoche) extraction of the active glucosides gives a larger yield —G TONI and P FARINI *Arch farmacol sper* 49 (1935), 186, through *Chem Abstr* 29 (1935), 4517

Æsculus Turginata, Blume—Saponin of the Seed of The author endeavored to apply Winterstein's method of preparing the saponin æscin from *Æsculus hippocastanum* to the Japanese species *Æsculus turginata*. A saponin was isolated from the seeds of the latter species but only after some modification in the procedure. The resultant compound was not identical with Winterstein's saponin and was named *Japoæscin* $C_{65}H_{104}O_{30}$, m p about 200° freely soluble in water, producing foam positive Liebermann reaction. Mineral acid readily hydrolyzed it to the pro saponin $C_{59}H_{94}O_{25}$ m p 210° dibromide prepared in methanol dec 175°. Further hydrolysis in alcoholic solution with mineral acid yielded Japoæscigenin $C_{35}H_{55}O_7$ m p 258°, probably isomeric with Winterstein's æscigenin m p 309°, 4 active hydrogens by Zerewitinoff's method. The prosapogenin is very difficultly hydrolyzed and much of it is recovered unchanged even after 50 hours refluxing with 5 to 10% hydrochloric or sulphuric acid. However the genin is readily saponified yielding tiglic acid and *Japoæscigenol* $C_{30}H_{42}O_6$ m p 307°, alcoholic solution neutral 5 active hydrogens by Zerewitinoff's method indicating 5 hydroxyl groups the remaining oxygen atom probably constituting a bridge, positive Liebermann reaction, one double bond. Two atoms of bromine react but the product separated is a monobromide $C_{30}H_{41}O_6Br$ m p 196°. Acetylation gives a tetra acetate m p 198°. Apparently a tertiary hydroxyl group was eliminated as a molecule of water —T MATSUKAWA *J Pharm Soc Japan* 55 (1935) 82-84

(R E K)

Cardiotonic Drugs—Investigation of Unreported sources were sought among folk medicines for cardioactive principles like the digitalis glucosides. Variations in the potency of commercial adonis are not attributable to the temperature at which the drug is dried. Assuming a value of 100% to represent the activity of the over ground portions of this herb, the activity was found to be distributed between the plant parts as follows buds, 53%, whole blossoms 48%, petals, 26%, roots, 26%. Alcoholic extracts were made in a Soxhlet apparatus of the herb and roots, respectively, of *Adonis vernalis* L, *A. autumnalis* L, *A. æstivalis* L, *A. wolgensis* Stev, *A. pyrenaica* DC., *Knowltonia vesicalaria*, *Eranthis hiemalis* Sal. The relative potencies of these extracts were determined by the 24 hour method of Straub. On the basis of color reactions the active constituents of all the species of adonis investigated are chemically similar, but by the same sign are unlike the constituents of *Eranthis hiemalis*. By appropriate treatment, the latter drug was resolved into a fatty acid, a resin acid, an active water and chloroform soluble fraction (Eranthin A) and an active water- and alcohol soluble but chloroform insoluble fraction (Eranthin B). Both active fractions represented the glucoside in an impure state. The two glucosides are not members of the adonis group since both of them gave reactions of the digitalis type. The results of different extraction methods applied to *Gratiola officinalis* L indicate that the cardiac activity is less readily extractable from *G. officinalis* than from *Digitalis purpurea*. The susceptibility of the frog to both *G. officinalis* and *D. purpurea* is similar using spring or autumnal frogs but no parallel could be drawn between the cumulative actions of the two drugs. Contrary to Montpellier, gratiolin (m p 268-269° C) possesses no cardiac activity. Gratioligenin and gratiogenin are likewise without activity. A cardioactive glucoside was isolated from *G. officinalis* which the author designated gratiotoxin. In crude form it was soluble in alcohol, glacial acetic acid, pyridine and chloroform but soluble in water with difficulty. Potencies of alcoholic Soxhlet extracts were determined for *Bowiea volubilis* Harv., *Orinthogalum longibracteatum*, *Ornithogalum umbellatum* L., *Paris quadrifolia* L., *Polygonatum verticillatum* (L.) All., *Sansevieria Kirkii* (Bak.) *Semele androgyna* (L.) Kth, *Veltheimia viridifolia* (L.) Jacq., *Veltheimia viridifolia* (L.) Jacq. In frogs *Paris quadrifolia* elicits no toxic symptoms of any form. In the last group of drugs *Bowiea volubilis* (bulb) was sufficiently active to warrant chemical study. The result of the chemical study was the isolation of two highly active glucosides of the scillaren type. The isolation pro

cedure and color reactions of both glucosides are given —R JARETZKY *Arch Pharm* 273 (1935), 334 (L L M)

Digitalis Purpurea—Digitoxin Content of *D. purpurea* from Canavese contains 0.22% of digitoxin —C BERTONASCO *Boll chim farm*, 74 (1935), 114, through *Chem Abstr*, 29 (1935), 4516

Digitalis Purpurea and Lanata A discussion concerning chemistry and relation between the different glucosides of both species —ARTURO STOLL *Farm Moderna*, 46 (1935), 287 (A E M)

Honeysuckle—Investigation of Some Species of The article consists of several tables of experimental data on *Lonicera Xylosteum* L and *L. alpigena* L, which are reviewed in detail and conclusions stated. The first table shows the results of studies on the fruits of the above species, the second compares the fruits of the above with those of *L. nigra* and the third gives data on the reducing sugar present. The berries of *L. Xylosteum* and *L. alpigena* contain an abundance of reducing sugar, a small amount of glucosides hydrolyzed by invertin and some products hydrolyzable by emulsin. The reducing sugar in the berries contains glucose, identified by the author as the *p* methyl glucoside. In *L. Xylosteum* this glucose represents 43% of the reducing sugar and in *L. alpigena* it represents 36% —C BEGUIN *Pharm Acta Helv*, 10 (1935), 109 (M F W D)

Labiatae—Tannins in The author found 10% and over of tannins in *Thymus vulgaris* L, *Mentha piperita* L, *Lavandula officinalis*, Charv., and others. 5% and over in *Marrubium vulgare*, L, *Rosmarinus officinalis* L, *Salvia officinalis*, L, *Hyssopus officinalis*, L, *Origanum vulgare*, L, *Origanum majorana*, L, *Thymus serpyllum* L, *Orthosiphon stamineus*, Benth and others, and less than 5% in *Melissa officinalis*, L —*Scientia Pharm*, 10 (1935), 23, through *Pharm Tijdschr Nederland-Indië* 13 (1935), 54 (E H W)

Microsechium Helleni, Tand (Pseudosechium Rand)—Constituent of This member of the Cucurbita family is used in Mexico as a means of catching fish by throwing discs of the root in the water and in a short time the fish come to the surface stunned and may then be caught. The drug has a bitter taste and produces a dust which causes sneezing and tears, in water a froth is produced which indicates a saponin body. From the drug 0.75% glycoside is produced as a white body with a bitter taste easily soluble in water and alcohol, insoluble in ether, chloroform and petroleum ether. It is prepared by the precipitation of the alcohol extract with tannin, decomposing the tannate with lead oxide and precipitation of the alcohol solution of the crude glycoside with ether, by repeated solutions and precipitations with alcohol and ether, respectively, the pure compound is formed or the drug is boiled with alcohol and precipitated from the cold alcohol solution by addition of ether. Examination of the glycoside indicates that it possesses a saponin like action dissolves red corpuscles, acts as a strong protoplasmic poison, produces intense local irritation, acts on the eyes, produces suppuration of the undercellular tissues and abscesses and increases the permeability of the blood vessels —G HEYL and O VOLLAND *Apoth-Ztg* 50 (1935) 310-312 (H M B)

Persica Vulgaris (Peach Tree) and Persicoside—Study of The authors have isolated a heteroside ("persicoside") from the 5 year old bark of *Persica vulgaris*. This heteroside differs from that obtained by the Japanese workers, since on hydrolysis C and R obtained glucose and hesperetol. **Extraction of Glycoside** —Boil the dried powdered bark with 90% alcohol. Distill off the alcohol until a syrupy residue remains. Dissolve in warm water, shake out with ether and set the remaining aqueous layer in a cool place. Brown crystals appear, and these may be purified from boiling water. The crystals are colorless, odorless, shiny and needle-like. They are soluble in strong alcohol and the melting point is 258-260°. From the elemental analysis the formula $C_{27}H_{34}O_{11}$ is proposed —C CHARAUX and J RABATE *J pharm chim*, 21 (1935), 495 (M M Z)

Sophoricoside New Heteroside from Fruits of *Sophora Japonica* The heteroside was extracted from the dried fruits with boiling alcohol. The alcohol was distilled off until a syrupy residue remained, and this was extracted with ether. The aqueous portion was allowed to stand until the solid separated. The solid was removed and recrystallized from ether. The glycoside crystallized in white prisms, which are slightly soluble in water and insoluble in organic solvents. It is odorless and gives a yellow color with sodium hydroxide. On hydrolysis with acids there is obtained glucose and a phenolic compound which the workers named sophoricol but it was later

shown to be identical with genisteol, isolated by Perkin and Newbury from *Genista tinctoria*—C CHARAUX and J RABATÉ *J pharm chim*, 21 (1935), 546 (M M Z)

Sugars—Crystalline Structure of Part I Preliminary data on sugars and glycosides is reported The cell dimensions for beta-methylarabinoside, alpha methylfucoside and alpha methylgalactoside 6 bromhydrin are reported (in Å)

	Arabinoside	Fucoside	Bromhydrin
d_{100}	8 10	9 96	10 58
b	7 74	7 87	7 81
c	5 89	5 72	2 × 5 62

E G COX T H GOODWIN and A I WAGSTAFF *J Chem Soc* (1935), 978-984 (G W F)

Verbena Officinalis L—Constituents of Verbenalin, a crystalline glucoside from *Verbena officinalis* L., and cornin, a glucoside from the root cortex of *Cornus florida* L. are identical Both glucosides have been assigned the same molecular formula, $C_{17}H_{24}O_{10}$, by different investigators both possess strong reducing properties, both are split by the enzyme emulsin, and upon hydrolysis yield d glucose For cornin the melting point and specific rotation are respectively $182-183^{\circ}$ C and $[\alpha]_D^{25} = -180.6^{\circ}$, for verbenalin they are 181.56° C and $[\alpha]_D^{25} = -180.52^{\circ}$ There was no depression of the melting point by mixed melting point determination—B REICHERT *Arch Pharm*, 273 (1935), 357 (L L M)

Other Plant Principles

Ch'ai Hu (Bupleurum Falcatum L)—Constituents of Roots of This ancient drug is used as antipyretic and expectorant From 13.6 Kg of dried material is obtained 3.5 Gm of an essential oil, $b_p 130-157^{\circ}$ $d_4^{20} 0.9194$ From the portion which is non volatile and insoluble in water are obtained a new alcohol bupleurumol, melting at $163-164^{\circ}$, and oleic linoleic, palmitic stearic and lignoceric acids—YOUNG FONG CHI and CHI MING MA *J Chinese Chem Soc*, 3 (1935), 78, through *Chem Abstr* 29 (1935) 4515

Coriaria Japonica, A Gray (IV)—Poisonous Constituents of It was shown previously that coriamyrtin was not a glucoside although hydrolysis with acids produced a substance which reduced Fehling's solution The dihydro derivative (colorless needles, $m p 255.5^{\circ}$, $[\alpha]_D^{20} +25.2^{\circ}$ in chloroform, negative Ribon reaction) of coriamyrtin obtained by catalytic hydrogenation, is converted by boiling dilute sulphuric acid into an isomer which forms a crystalline tolylosazone $m p 202-203^{\circ}$ This indicates either an α -hydroxy-ketone or -aldehyde group in the molecule Like picrotoxinin coriamyrtin and dihydrocoriamyrtin form acetone when treated with alkali Chlorine substitutes one atom of hydrogen to form the mono derivative $m p 204-205^{\circ}$, white prisms—T KARIYONE and K KASHIWAGI *J Pharm Soc Japan* 54 (1934), 31-32 (R E K)

Daphne Genkwa—Constituents of The Chinese drug Yuen hua, *Daphne genkwa*, Sieb et Zucc has been in medical use since 160 B C, it is also called Chojisakura or Fujimodoki in Japan Nakao has already recorded the presence of a vesicating substance in the drug Further investigation shows that it contains the following constituents sitosterol $C_{27}H_{48}O$ $m p 136-137^{\circ}$ C, apigenin, $C_{15}H_{10}O_6$ $m p 352^{\circ}$ C, genkwainin, a new flavone $C_{16}H_{12}O_6$ $m p 206^{\circ}$ C and benzoic acid Genkwainin is found to contain one methoxyl group, and its molecular structure is further discussed—M NAKAO and K F TSENG *J Shanghai Sci Inst* 1 (1933), 1, through *Quart J Pharm Pharmacol*, 8 (1935), 265 (S W G)

Hydrangea Paniculata—On the Constituents of, and on Hydrangin *Hydrangea paniculata* grows wild in the hilly regions of Japan and is used as a glue in the manufacture of paper The authors extracted the flowers and flower stalks with benzene and obtained an alcohol soluble, crystalline product from the extract This product proved to be umbelliferone $C_8H_6O_3$, $m p 224^{\circ}$, bluish fluorescence in the aqueous solution, sublimed without decomposition mono methyl ether by diazomethane $m p 114^{\circ}$, identical with synthetic umbelliferone and its derivatives Bonduant and later Schroeter isolated a substance called Hydrangin from *Hydrangea arborescens* a native of the United States In view of the close botanical relationship between the two species the authors believe that Hydrangin is identical with umbelliferone—A ASHIMOTO and T KAWANA *J Pharm Soc Japan* 55 (1935) 44 (R E K)

Phytochemical Notes No 108 A Phytochemical Study of the Seed of the Digger Pine

Samples of ground seed, of seed coats and of endosperm were extracted with selective solvents. Data are tabulated. Then a petroleum ether extract consisting chiefly of fatty oil was prepared and cold alcoholic percolate was concentrated. From saponification, iodine and thiocyanogen values, percentages were calculated: 4.3% saturated fatty acids, 50.5% oleic acid and 45.2% linoleic acid. Further study of the oil after fractionation indicated hexoic acid, nonoic acid and azelaic acid, and fatty acids of 16 and 18 carbon atoms. These data indicate that the first double bond is at the 9-10 position; also that this or a second double bond is in the 6-7 or 9-10 position from the end. Had malonic acid been isolated this would indicate only oleic and linoleic acids. Malonic acid formed must have been lost during purification. Study of the soap solution indicated saturated fatty acids 5.5%, oleic acid 51%, linoleic acid 43.5%. Lead soap of the liquid fatty acids and of the solid fatty acids were prepared and studied. Methyl esters of the supposedly saturated acids were distilled and constants determined. Presence of palmitic acid was indicated in a mixture of two esters and two others yielded stearic acid. Further study of liquid fatty acids seemed to indicate dihydroxy stearic acid. Experiments to see if there were volatile fatty acids gave negative results.—JOSEPH SEMB *J Am Pharm Assoc*, 24 (1935) 609 (Z M C)

Plants, Toxic—Chemical Problems Connected with the Study of Investigation and Isolation of the Active Principles I Alkaloids These may be extracted easily by exhaustion with a mixture of equal parts of alcohol, ether and ammonia in the case where the base is free and soluble in organic solvents. In other cases, the alkaloids may be first set free by using a weak acid. The solvent is evaporated and the residue dissolved in a weak acid. They may be purified by the process of alternately rendering soluble the free base in an organic solvent and the salts in an aqueous solvent. The separation of the various alkaloids may be accomplished by their different degrees of basicity. Crystallization and sublimation under low pressure may be of great aid. **II Glucosides** The biochemical method of Bourquelot is employed. Extract with boiling alcohol (96°) evaporate and dissolve the residue in water. Keep half of the solution for comparison and add yeast to the other half. After complete inversion destroy the yeast with heat, cool and add emulsin. A variation in the rotatory power in the dextrorotatory direction indicates the presence of glucoside. The method of separation varies with the case. For example, the aqueous solution may be purified with lead acetate. The greater part of the glucosides remain in solution. Entirely eliminate the lead, and, after filtering, concentrate to a syrupy consistence and dissolve in alcohol. Complete the purification by successive crystallizations from a warm solution of ethyl acetate. One may also add a sufficient quantity of calcium sulphate and calcium carbonate to the purified solution to obtain a dry powder which may be extracted directly with ethyl acetate. Finally, certain plants were extracted directly with ethyl acetate without other previous operation. **III The bitter principles** may be extracted with chloroform after treatment of the plant with petroleum ether to eliminate fat.—C RIMINGTON *J South African Chem Inst*, 17 (1934), 44-47 through *Chimie et Industrie* 33 (1935), 918-919 (W A P)

Uvaria Catocarpa—Constituents of The fruits of *Uvaria catocarpa* (Diels) (Fam. *Anonaceae*) are used in the local medicine of Madagascar under the name of Senasena or Senanasena finding use as stomachics, febrifuges, sedatives, tonics and disinfectants. Analysis of the fruits showed: **A Seeds**—(1) Fats Saponifiable 13.96%, unsaponifiable 0.2445%, containing 0.075% phytosterol, total glycerides 19.30%. Empirical formula of the separated crystallized fatty acid $C_{18}H_{34}O_2$. (2) Carbohydrates reducing sugars (glucose) 1.05%, hydrolyzable sugar (as cane sugar) 0.4089%, starch 16%. (3) Organic acids (a) Non-volatile oxalic, citric, malic, (b) volatile acetic and formic. (4) Resin Semi liquid, dark brown and bitter, 4.40%. (5) Proteins albumins, globulins and alkali albumins. Total nitrogen 1.89% (corresponding to 11.80% protein). **B Pericarp**—(1) Fats Saponifiable 1.92%, unsaponifiable 0.422% containing 0.0774% phytosterol, total glycerides 3.04%. (2) Carbohydrates reducing sugars (glucose) 1.35%, hydrolyzable sugars (sucrose) 0.1425%. (3) Organic acids (a) Non volatile oxalic citric and malic, (b) volatile acetic formic and butyric. (4) Resin solid, brownish black, acid taste 5.63%. (5) Proteins albumins, globulins and alkali albumins. Total nitrogen 1.545% (corresponding to 9.65% proteins). (6) Volatile oil Yellowish green fragrant odor D 0.9244, refr ind 1.5231 at 18°. (7) Glucosides A glucoside was found which was hydrolyzable by emulsin. This ferment is present in the pericarp. **C Entire Fruit**—Inorganic constituents. Ash 1.56% containing Cu Fe Mn K Na P S and As.—J M COISNARD Dissertation (Paris), through *Pharm. Tijdschr. Nederland-Indie*, 13 (1935) 51 (E H W)

Unclassified

Coumarins—Improved Method for the Synthesis of, by v Pechmann's Method A solution of the phenol and beta-keto ester in absolute alcohol is saturated with hydrogen chloride at room temperature (cooling with ice water) and kept in a well stoppered flask for 20 hours. It is then poured into water and the coumarin collected after an hour. One recrystallization from dilute alcohol is usually sufficient. This method avoids sulphonation of aromatic nuclei, prevents saponification of the beta-keto ester, gives an improved yield (90%) and purer products. In cases where little or no reaction can be obtained with concentrated sulphuric acid (phenol, beta naphthol, quinol), the new method also gives bad results.—HERBERT APPEL *J Chem Soc* (1935), 1031-1032 (G W F)

Heptane and Its Solutions—Chemistry of No 6 Solubility of the Halogens in Heptane The heptane was prepared from hydrocarbon of Jeffrey pine oil. Details of preparation are given and various experiments reported. Thirty experiments on solubility of chlorine in heptane are tabulated, showing temperature, grams dissolved, grams hydrogen chloride found in 100 cc of solution. Other tables show solubility of bromine and iodine. Reactibility with other elements was tried. Of the first group, lithium, sodium and copper were used. Over night, lithium and sodium almost completely disappeared. A solution of chlorine in heptane added to finely powdered copper reacted with phenomenon of flame. When solution was kept in an ice bath for several hours there was no flame but loss of color of chlorine indicated reaction. Flame is produced when chlorine gas is in contact with phosphorus, copper, boron and silicon in powder. Chlorine in heptane solution gives like phenomena with red phosphorus and powdered copper. Trial of chlorine hydrate upon red phosphorus and powdered copper gave negative results. Of the second group calcium, cadmium, magnesium and lead were tried. Calcium yielded bubbles with chlorine and bromine, magnesium and cadmium were little affected, lead decolorized all three. Of group three, aluminum was found to react with all three. References to earlier reports are appended.—JOSEPH SEMB *J Am Pharm Assoc*, 24 (1935), 547 (Z M C)

Iodoform and Thymol Iodide—Preparation and Properties of The pharmacopoeial requirements concerning iodoform, and its preparation from acetone, potassium iodide and sodium hypochlorite are dealt with. Illustrations of its different crystalline forms are given. Two methods of preparing thymol iodide have been investigated. It has been shown that the substance resulting from direct iodination is different from that produced when a hypochlorite is used as the intermediary. With the latter a certain amount of chlorination is also brought about. The B P C sets the standard of 40% iodine content, but some commercial samples fail to meet this requirement.—N GLASS *Pharm J*, 134 (1935), 785 (W B B)

Isopropyl Nitrite—Note on Isopropyl nitrite was tried as a substitute for sweet spirit of nitre because of the ease with which ethyl nitrite (the active constituent of sweet spirit of nitre) volatilizes. Isopropyl alcohol was tried because of its high purity, low cost, low toxicity and because it permitted extemporaneous preparation. The official method for ethyl nitrite invariably leads to the production of some acetaldehyde, using the same method but substituting isopropyl alcohol, appreciable quantities of acetone, a more undesirable by product, would be produced.—C L M BROWN *Pharm J*, 134 (1935), 793 (W B B)

Pharmaceutical and Phytochemical Products—Directions for the Preparation of The following products are discussed on the bases of (1) name, (2) chemical formula and molecular weight (3) raw materials (4) apparatus (5) time, (6) directions, (7) yield, (8) properties, (9) tests (10) chemical reactions involved and (11) references (a) paraformaldehyde (b) d glucose, (c) sodium thiosulphate, (d) zinc lactate, (e) milk sugar, (f) casein, (g) isoborneol (h) aconitic acid, (i) veratrol (j) mucic acid and (k) benzoyl peroxide.—C A ROJAHN *Apoth Ztg*, 50 (1935), 910-916 (H M B)

N-Phenyl-Piperazine—Derivatives of Although it is a cyclic compound, N phenyl piperazine, $\text{C}_6\text{H}_5\text{—}\begin{array}{c} \text{CH}_2\text{CH}_2 \\ \diagup \quad \diagdown \\ \text{CH}_2\text{CH}_2 \end{array}\text{—NH}$ first prepared in 1933 from aniline and dibromo diethylamine

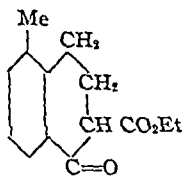
shows the characteristic reactions of an aliphatic secondary amine. Physiologically, from experiments upon frogs and rabbits, it is found to provoke a reflex hypersensitivity analogous to that of strychnine. It reacts with ethylene oxide to form N-β oxyethyl-N'-phenylpiperazine, $\text{R—CH}_2\text{—CH(OH)—}$ which was identified by its salts and its acetyl and benzoyl derivatives. The benzoyl

derivative of the new alkylamine showed slight anesthetic properties With 40% formaldehyde the amine gave diphenylpiperazyl methane, $R-CH_2-R$, and with phosgene solutions the $N-N'$ -

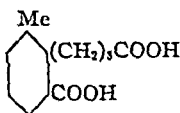
diphenylpiperazine carbonyl, $R-CO-R$ ($R = C_6H_5N \begin{smallmatrix} CH \\ | \\ C_2H_5 \end{smallmatrix} N-$) It also reacts with a variety

of halogen compounds, including ethyl bromo acetate, benzyl chloride and 2,4-dinitro-chlorobenzene The product with the last-named substance, phenyl- N -2,4-dinitro-phenylpiperazine, $R-C_6H_4(NO_2)_2$, is photo sensitive—V PRELOG and Z BLAZEK *Coll Czech Chem Communications*, 6 (1934), 549, through *Pharm J*, 134 (1935), 649 (W B B)

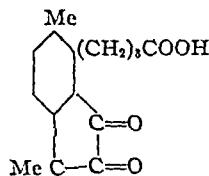
Picrotoxin—Part I The constitution of picrotic acid and the C skeleton of picrotoxin and picrotin is reported By applying the Dieckmann reaction to the ethyl ester of an acid, $C_{12}H_{14}O_4$, obtained by hydrolytic fission of picrotic acid, the beta-ketonic ester (I) resulted Thus the acid must have the formula (II), indicating that picrotic acid must have the structure (III) rather than (IV), and the C-skeleton (V) for the lactones, picrotoxin and picrotin



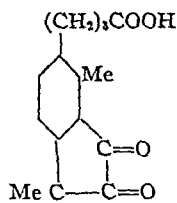
I



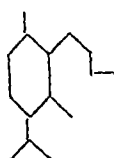
II



III



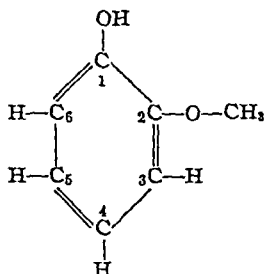
IV



V

DONALD MERCER, ALEXANDER ROBERTSON and ROBERT S CAHN *J Chem Soc* (1935), 997-1000 (G W F)

Potassium Guaiacol Sulphonate Though a very stable compound it is popularly believed to be absorbed as an entire molecule Guaiacol, the basic substance, has the following structure



With the above numbering of carbon atoms four guaiacol sulphonic acids are possible, the 1, 2, 3 the 1, 2, 4, the 1, 2, 5 and the 1, 2, 6 From each one of these acids, as well as by replacement of the H of the OH group, salts may be formed The only important sulphonates in the present consideration are those in which the metal enters the sulphonic acid group Much confusion has arisen in the nomenclature by different writers in the use of terms such as ortho, meta and others to indicate position of substituents The present investigation was prompted by the questions of difference in therapeutic activity, choice of most active form and distinguishing tests for it, and which form is most commonly sold Available literature yielded no thorough pharmacological study but references are made to reports that have been made tracing the history briefly The 1, 2, 6 compound

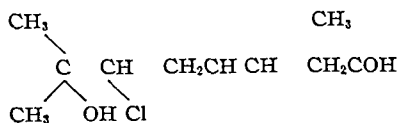
has been recognized by New and Nonofficial Remedies 1918 to 1934 editions, Svenska Farnaköpen, 1925, Phar Hungarica, IV, 1934, British Pharm Codex, 1934, Deutsches Arzneibuch, prior to 1936, Merck's Index, IV, 1930. From the various sources studied, it is concluded that up to 1926, products on the market were mixtures of the 1,2,4 and the 1,2,5 compounds with varying amounts of the basic one. It seems certain that the 1,2,6 compound has not been made. Seven different sources gave substantially the same product. Tests and data, upon which the conclusions are based, are enumerated. The proportion of the 1,2,4 to the 1,2,5 is approximately 3 to 1.—A. H. CLARK and ERNST KIRCH, *J Am Pharm Assoc*, 24 (1935) 564 (Z. M. C.)

β -Santonin—Properties of β -Santonin, a stereoisomeride of santonin, has been obtained from samples of Artemisia from the N. W. Frontier of India, and occurs as colorless prisms, m p 216–218° C, $[\alpha]_D^{19}$ $^{\circ}$ -137.2° , the oxime having m p 224° C. On reduction with palladized charcoal and hydrogen in acetic acid, β santonin gives tetrahydro- β santonin, m p 207–208° C, and tetrahydro β santonin-b, m p 125–126° C, both the above on reduction with zinc and hydrochloric acid give deoxytetrahydro β santonin, m p 75–76° C, and this substance on dehydrogenation with selenium gives 1-methyl-7-ethylnaphthalene. β Santonin treated with sulphuric or hydrochloric acid forms *l*-desmotropo β santonin, m p 253° C, $[\alpha]_D^{20}$ $^{\circ}$ -101.7° , and this on treatment with potassium hydroxide gives *l*-isodesmotropo β santonin, m p 194° C, $[\alpha]_D^{20}$ $^{\circ}$ -136.8° , identical with *l*-desmotropo santonin obtained by treating santonin with sulphuric acid, reduction of this substance with zinc and acetic acid gives *d*-santanous acid, m p 177–178° C, $[\alpha]_D^{22}$ $^{\circ}$ $+75^{\circ}$, the ethyl ester having m p 117° C, $[\alpha]_D^{20}$ $^{\circ}$ $+75^{\circ}$. *l*-Desmotropo β santonin reduced with zinc and acetic acid gives *d* β santanous acid, m p 174° C, $[\alpha]_D^{20}$ $^{\circ}$ $+54.9^{\circ}$, and treatment of this acid with barium hydroxide gives a *d* β -santanous acid, m p 152° C, $[\alpha]_D^{20}$ $^{\circ}$ $+60.9^{\circ}$ together with 1,4-dimethyl β naphthol.—G. R. CLEMO, *J Chem Soc* (1934) 1343, through *Quart J Pharm Pharmacol*, 8 (1935) 264 (S. W. G.)

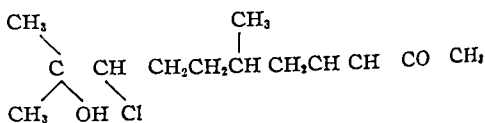
Sapogenins—Spectrographic Observations on Various. The absorption spectrograms of hederagenin, oleanolic acid and α ursolic acid are very similar and show neither maxima nor minima. It is therefore difficult to distinguish these compounds by this means. β -Ursolic acid is sharply differentiated from the α acid by its absorption spectrum which has 2 maxima between 3500 and 4000 μ . Taraligenin has a curve identical with that of oleanolic acid. Kotake reported that taraligenin and panaxsapogenin are identical, and Kitasato subsequently established the identity of panaxsapogenin with oleanolic acid. But Winterstein supposed that taraligenin represented a mixture of oleanolic acid and hederagenin. The authors subjected their taraligenin to fractional crystallization from chloroform-methanol according to Winterstein, but obtained no hederagenin. From their spectrographic examination as well as this result they believe that taraligenin and oleanolic acid are very closely related if not identical.—S. KUWADA and T. MATSUKAWA, *J Pharm Soc Japan*, 54 (1934), 32–34 (R. E. K.)

Tannin Esters. Water-soluble metal albumin tannin ester compounds are prepared by dissolving tannin esters (other than acetyltannin esters), which still contain free phenol groups and are saponifiable at ordinary temperatures by normal sodium carbonate solution only with difficulty, in such quantity of aqueous alkali or alkali reacting alkali salt that the solution is still weakly acidic and treating with aqueous metal albumin solutions. The compounds are used therapeutically in solution or in powdered form. Among examples benzoyltannin is made by heating a mixture of tannin, sodium benzoicum and diphenyl ether in a water bath, diluting largely with water, filtering, washing and vacuum drying at 30–40°. A solution of the product is added to an aqueous solution of argemum proteimicum and the solution evaporated.—H. COHN and C. SIEBERT, Brit Pat 423 057 (Jan 24, 1935), through *Chem Abstr*, 29 (1935), 4524.

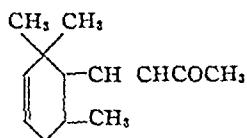
Tiemann's Iron—Synthesis of. Reaction of hypochlorous acid upon rhodinal resulted in the formation of hydroxy chloro rhodinal (I), treatment with acetone and an alkaline agent resulted in dimethyl hydroxy chloro undecenone (II), dehydration and cyclization accomplished by phosphoric acid in ether produced iron (III).



I



II



III

The synthetic product had a boiling point of 140° at 12 mm, density (15/15) = 0.940, $\alpha_D = -21$. The optical rotation is inverse to the natural product (+40, +33) —ALBERT VERLEY *Am Per-fumer*, 30 (1935) 235-236 (G W F)

BIOCHEMISTRY

Anterior Pituitary—Growth Hormone of A review of pertinent literature, with discussion —H N EVANS *J Am Med Assoc*, 104 (1935), 1232 (M R THOMPSON)

Anterior Pituitary and Anterior Pituitary-Like Substances A review of pertinent literature, with discussion —EMIL NOVAL *J Am Med Assoc*, 104 (1935), 993 (M R THOMPSON)

Biochemistry—Inorganic, Note on Of the ninety-two known elements, thirty six have been found associated in one way or another with some form of living matter. Biological elements are classified into certain groups, including in the first two groups invariable primary elements such as hydrogen, carbon, nitrogen and phosphorous, found in all forms of life and concerned with physical structure, and invariable secondary elements, calcium, magnesium, sodium, potassium, iron, sulphur and chlorine which occur in smaller quantities than those in the first group. Manganese is essential for farm crops and also for growth in milk-fed rats. Copper plays other parts in animal life besides association with hemoglobin, notably in pigments such as hemocyanin in molluscs and in the ink of the octopus, which is of melanin nature. It has also been suggested that copper is associated with the vitamin B complex in its action on the body. There is evidence that hormones may be associated with inorganic ions. The best known example is thyroxine with iodine. The intake of calcium and phosphorus plays an important part in the healing of rickets, it has been found that reducing the Ca/P ratio from 4-1 to 2-1 is equivalent to giving 0.7 unit of vitamin D. Also, there is a preference of high calcium diets over those of low calcium content for manifesting parathyroid activity. Magnesium appears to be connected with tetany, renal damage and the activation of the enzyme phosphatase —F J DYER *Pharm J*, 134 (1935), 563 (W B B)

Blood Urea—Estimation of Take 5 cc of oxalated blood (potassium oxalate), add 5 cc of 10% trichloroacetic acid. Centrifuge for three minutes at full speed or filter. Titrate 5 cc of the clear supernatant liquid with 5% mercuric chloride, using 20% sodium carbonate as indicator. Add mercuric chloride until one drop of titrated solution turns one drop of indicator brown in three seconds. **Calculation** Let x = number of cc of mercuric chloride used. Then $40x = 60 + y$ mg urea/100 cc of blood —C M DOUGLAS *Practitioner* (1935), 378, through *Pharm J*, 134 (1935) 423 (W B B)

Calcium—Availability of, in Foods Containing Oxalates A preliminary report of work to be undertaken on the occurrence of oxalates in foods and their effect in the diet of the rat —E F KOHMAN and N H SANBORN *Ind Eng Chem*, 27 (1935), 732 (E G V)

Calcium in Serum—Volumetric Determination of The 0.2 cc sample is treated with 0.5 cc of cold saturated ammonium oxalate solution, and, after standing over night, diluted with 1 cc of water and centrifuged for 15 minutes at 3000 r p m. The precipitate is washed three times with 3 cc of ammonia solution made by diluting 2 cc of concentrated ammonia to 100 cc. It is then dissolved in 0.5 cc of 4 N sulphuric acid on a water-bath cooled and treated with 2 cc of 0.001 N tetravalent cerium sulphate. After 3 minutes, a few drops of 1% potassium iodide solution are added and a little 0.25% starch solution and the mixture titrated with 0.001 N sodium thiosulphate containing 0.048% of sodium hydroxide. The cerium sulphate solution, which is preferred to potassium permanganate as a sharper and more accurate end-point is given, is prepared by dissolving 1 Gm of the finely powdered salt in 100 cc of water with 30 cc of concentrated sulphuric acid, and diluting to 750 cc. It is standardized against the 0.001 N thiosulphate, diluted to volume and restandardized —F RAPPAPORT and D RAPPAPORT *Mikrochemie* 15 (1934), 107, through *Quart J Pharm Pharmacol*, 8 (1935), 281 (S W G)

Follicle Hormone Derivatives Acyl octahydrofollicle hormones are obtained by treating the acyl derivatives of the isomeric dihydrofollicle hormones with hydrogen in the presence of catalysts, whereby 6 further hydrogen atoms are taken up by each molecule. The starting materials may be obtained by hydrogenation of the acyl derivatives of the follicle hormone. Among examples, (1) monobenzoyldihydrofollicle hormone in alcoholic solution is hydrogenated at 140° under 100 atmospheres pressure in the presence of a catalyst obtained by reducing a mixture of nickel oxide and copper oxide and (2) diacetyldihydrofollicle hormone is hydrogenated at 180° and 100 atmospheres in the presence of cyclohexanol and a nickel-chromium catalyst. The compounds obtained have a physiological effect similar to that of male sex hormone. The benzoyl derivative may be saponified to yield the octahydrofollicle hormone $C_{18}H_{30}O_2$ —SCHERING KAHLEBAUM A G Brit Pat 423 287 (Jan 29, 1935), through *Chem Abstr*, 29 (1935), 4524

Hormones from Urine For concentrating sexual hormones in urine, the urine is substantially saturated with a highly soluble sulphate such as ammonium sulphate which is capable of producing a salting-out effect; the mixture is allowed to stand until it separates into two layers, and the supernatant layer, which contains substantially all the hormone in concentrated form, is recovered—H LANGECKER (to Schering-Kahlbaum A-G) U S Pat, 2,001,255 (May 14, 1935), through *Chem Abstr*, 29 (1935), 4524

Hormones in Pregnancy Urine—Investigation of the New Biologic Test for Kanter, Bauer and Klawan have recently (1934) reported experiments on a new biologic test for hormones in pregnancy urine in which they intimate the usefulness of the female bitterling in the diagnosis of pregnancy. They used the lengthening of the female ovipositor as a criterion of positive reaction, and suggested a method of standardizing the bitterling to avoid erroneous results. In the present study, the test consisted of placing a mature female bitterling in a 2 liter bowl containing 1500 cc of water. Six cc of the urine to be tested was added to each bowl. The fish were observed at 24-hour intervals for 72 hours. Elongation of the ovipositor to at least 25 mm was taken as a positive reaction, a length of 15 mm was considered a moderate enlargement (doubtful) about 10 mm was called slight enlargement (probably negative), and a negative reading was an ovipositor measuring 5 mm or less. Forty-six fish were placed in individual aquariums. Five groups of urine were tested. After 48 hours, most of the fish had either reacted positively, or not at all, and the 72 hour reading showed little or no variation from the 48-hour reading. Only 9 of 21 urines from pregnant women gave definitely positive reactions. Of 7 from normally menstruating non pregnant women, 4 gave positive reactions. One male urine of 4 tested was positive and a later specimen from the same male gave positive reactions in every one of the 6 fish tested. Urines from women who had passed the menopause were positive in 1 of 3 cases. Boiled urines from pregnant women were positive in some instances and negative in others. It was concluded that the biologic reaction is not a specific test for pregnancy. The studies are being continued—I S KLEINER, A I WEISMAN and H BAROWSKY *J Am Med Assoc*, 104 (1935), 1318 (M R THOMPSON)

Humoral Medicine and Chemistry The humors like the cells consist chiefly of colloids among which take place all vital reactions and phenomena of growth, nutrition and senility. The harmfulness of pathogenic agents is related to the production of plasmatic precipitates. In harmful colloidal reactions, the precipitates which are formed are flocculates, and it is by flocculation that the colloidal state (which governs life) is destroyed and this destruction produces disease and death. In many sick people humoral instability is a primary cause of flocculation, the latter then occurs at the slightest cause, and in order to cure such patients a greater stability must be imparted to their blood plasma. The means used to consolidate the colloidal state are few in number and were discovered empirically. To date one of the most remarkable, magnesium thiosulphate, proposed by the author, has been of inestimable value in this respect—AUGUSTE LUMIÈRE *14me Congrès de Chimie Industrielle, Paris*, Oct 21-27, 1934, 15 pp (A P C)

Hydrochloric Acid—Determination of, in Stomach Contents The author discusses the reaction of Gunzburg which has been used to determine the hydrochloric acid content of gastric juice. This is the phloroglucin hydrochloric acid reaction. The various concentrations of acid, the presence of other constituents in the gastric juice etc., are discussed especially as to their effect on the reaction. The author then suggests a new reaction. Two hundred mg of resorcin and 200 mg of vanillin are dissolved in boiling water. Upon cooling a portion of these substances crystallize out. This suspension of minute crystals is kept in a wide-mouth bottle through the cork of which a dropping tube is inserted. A drop of the reagent is evaporated to dryness. A drop

of the stomach content is then added to the residue, the presence of hydrochloric acid causing a beautiful violet color. The reaction was obtained with normal gastric juice as well as with an artificial gastric juice having the following composition: 99% water, 0.3% pepsin, 0.15% NaCl, 0.05% KCl, 0.005% CaCl_2 and traces of phosphates and iron salts. Experiments were made with gastric juice containing a variety of concentrations of hydrochloric acid (0.03N, 0.02N, 0.01N, 0.005N, 0.0025N, 0.0015N). All concentrations of hydrochloric acid give a reaction except those of 0.0015N and less. Since the reaction is positive with concentrations above 0.0015N a rough estimate of the hydrochloric acid content in a given sample may be obtained by preparing a series of dilutions of the sample and submitting them to the test. All of the strong acids give a positive reaction; even boric acid gives a weak violet color. The organic acids react as follows: oxalic acid—a distinct color; malic and tartaric acid—a weak violet color; formic, acetic, propionic, butyric, caprylic, capronic, valeric, citric, cinnamic and lactic acids gave negative reactions. Since lactic acid occurs occasionally in the stomach in certain pathological conditions concentrations as high as 0.1 and 0.2N were tried. The result was negative. The obtaining of a violet color with the reaction then depends largely upon the presence of an inorganic acid, and the inorganic acid in gastric juice is hydrochloric acid.—M. WAGENAAR *Pharm Weekblad*, 72 (1935), 837 (E. H. W.)

Insulin—Sulphur in In studying the constitution of insulin with respect to sulphur content, Freudenberg and Wegmann found that the compound was a protein containing two cystine residues in a peptide like structure to which were attached peripheral, apparently smaller sulphur-containing groups in disulphide formation. The molecule broke up into an SH compound (Ins SH) and a smaller fragment (HSR) when hydrogenation split the $-\text{S}-\text{S}-$ bond. Considering the intact insulin as $\text{Ins S}-\text{SR}$, it split into the inactive portions $\text{Ins SH} + \text{HSR}$. Oxidation of the hydrogenated insulin with hydrogen peroxide in the presence of cysteine gave a new, active, insulin like compound, represented by the structure $\text{Ins S}-\text{S}-\text{Cys}$. The HSR residue obtained by hydrogenation of insulin therefore, was not cysteine. SH-Glutathione could be substituted for cysteine, but thioglycolic acid could not, indicating that the effect of cysteine and SH-glutathione was not due to their buffer action. Regeneration of insulin occurred under the above conditions after inactivation by alkali. Thus alkaline inactivation also involved hydrolysis of the $-\text{S}-\text{S}-$ group. This was further indicated by the liberation of hydrogen sulphide on acidification after alkaline treatment, and by the marked change in optical rotation on inactivation of insulin by hydrogenation or alkali. Ultraviolet irradiation inactivated insulin with evolution of hydrogen sulphide, and oxidation of the inactive product in the presence of cysteine gave an active compound again. Alkali inactivation also produced some ammonia together with hydrogen sulphide and this ammonia apparently was due to decomposition of insulin and did not occur as an impurity of the alkali. Other isolated facts about insulin were as follows: the van Slyke determination of free amino nitrogen was questionable since it is known that organic sulphur (cystine, thioglycolic acid) can reduce nitric acid to nitrogen and thus give high values; iodoacetic acid at $\text{pH } 7.4$ destroyed the activity of insulin so slowly that no reciprocal action with an SH-group was observed; hydrogen persulphide markedly and rapidly attacked the action of insulin, whether by oxidation or hydrogenation was not known, and gave a very toxic compound causing destruction of the skin and depilation at the site of injection; ketene also inactivated insulin. The molecular weight of insulin was apparently 9,000–18,000.—K. FREUDENBERG and T. WEGMANN *Z. physiol. Chem.*, 233 (1935), 159, through *Squibb Abstr. Bull.*, 8 (1935), A-964.

Iron—Colorimetric Micro- and Submicro-Method for the Determination of 8-Hydroxyquinoline which has met with such success in inorganic analysis has been adapted to the quantitative determination of small amounts of iron. The color obtained in alcoholic solution is very intense greenish black. Before the iron is precipitated, calcium is separated with oxalate. The determination itself is made in a photoelectric colorimeter.—LAVOLLAY *Soc. Chim. Biol.*, 17 (1935) 432, through *Pharm Weekblad*, 72 (1935), 691 (E. H. W.)

Milks—Biological Equilibrium and Disequilibrium of Commercially Modified Cow milk, in spite of its low iron content and the rapid disappearance of its antiscorbutic activity under various commercial treatments for ensuring its preservation, constitutes a food of which the biological equilibrium can readily be brought out by experiments on pigeons. The unbalance of the biological equilibrium of milk powders increases with the degree of skimming of the milk. As carried out in the manufacture of condensed milks addition of very large quantities of sugar upsets

the equilibrium of very high fat milks, on the other hand it compensates biologically a partial skimming Addition of whey, sugar and starches attenuates the biological disequilibrium of skimmed milk, especially of concentrated buttermilk —**RAOUL LECOQ** *14me Congrès de Chimie Industrielle, Paris*, Oct 21-27, 1934 5 pp (A P C)

Nutritive Value of Foods—Action of Some Commercial Practices on More or less prolonged action of a dry heat of 180° can change very considerably the nutritive value of foods, when, however, the change is confined to the sugar portion of a mixture (e g, caramelization), the change in nutritive value is less marked As practiced in the canning industry, a wet heat of 112° produces only a slight decrease in the vitamins B and C contents An alkaline reaction (e g, obtained by addition of baking powder) tends to increase the destruction of vitamins, while an acid reaction exerts a protective action —**RAOUL LECOQ** *14me Congrès de Chimie Industrielle Paris* Oct 21-27, 1934 5 pp (A P C)

Sex Hormones II Estrus-Producing Hormones Natural and synthetic compounds which can cause the production of estrus in addition to other activities of the female sex hormones are discussed Structural formulas for nine of the compounds are given indicating the relationship between their physiologic activities and chemical constitution —**C R ADDINALL** *Merck Report*, 44 (1935) 7 (S W G)

Sugar in Blood—Volumetric Determination of The method of Hagedorn and Jensen is adapted for use with one fifth the original quantity of blood or plasma The sample of 0.02 cc is carefully measured into Wassermann tubes containing 1 cc of N/50 sodium hydroxide, and 1 cc of 0.45% zinc sulphate solution is added to each tube These are heated in the water bath for 3 minutes, cooled and filtered into Hagedorn-Jensen tubes The Wassermann tubes are washed 3 times with 1 cc of hot water which is poured through the filter 2 cc of phosphate ferricyanide solution is added to each tube, and the mixture heated for 20 minutes in the water bath After cooling, 1 cc of a 2.5% solution of potassium iodide in 20% zinc sulphate is added followed by 1 cc of 20% phosphoric acid and a little 0.25% starch solution The contents are then titrated with 0.001N sodium thiosulphate containing 0.048% sodium hydroxide The phosphate ferricyanide solution is made by mixing just before use, equal parts of a 0.09% solution of potassium ferricyanide, and a solution containing 2.1% of secondary and 6.375% of tertiary potassium phosphate —**F RAPPAPORT** and **R PISTNER** *Mikrochemie* 15 (1934) 111, through *Quart J Pharm Pharmacol*, 8 (1935), 282 (S W G)

Testicular Hormone, Crystalline **David, et al**, have now prepared very active crystals from testicular extracts and suggested calling the crystalline preparation testosterone (I) I had an activity, compared to capon units of about 10 γ and had a uniform crystallographic structure as well as constant physical properties In the infantile castrated rat, I had a weaker action than an equivalent number of capon units of unpurified testicular extracts, and if a completely inactive extract prepared from testicles or other starting materials such as urine was injected with I, the relative growth of the seminal vesicles was the same as obtained with aliquot amounts of crude testicular extract Thus there must have been a second substance in the crude extracts which was an activator for I This was also true to a certain extent for dehydroandrosterone, but not for androsterone To illustrate the difference between I and androsterone, the melting points were 154-154.5° and 181-183° respectively, the specific rotation in alcohol, +109° and +96°, respectively, and the capon unit, +10 γ and 70-100 γ respectively —**K DAVID**, **E DINGEMANSE**, **J FREUD** and **E LAQUEUR** *Z physiol Chem*, 233 (1935) 281, through *Squibb Abstr Bull* 8 (1935), A 983

Urine and Blood Serum—Determination of Indoxyl Content of The author has applied the Heitz Boyer and Grigaut indoxymeter to the determinations obtaining satisfactory results using the Jolles reaction The apparatus contains glass tubes 14 mm in diameter and graduated into 5, 6, 16, 20 and 22 cc To the urine is added 10% of a solution of basic lead acetate and filtered Five cc of the filtrate is put into the tube which is then filled to the 6 cc mark with a 5% alcoholic thymol solution Hydrochloric acid (Sp Gr 1.17) containing 3 Gm ferric chloride per litre, is then added until the 16 cc line is reached After standing thirty minutes the tube is filled to the 22 cc mark with chloroform The tube is then shaken, allowed to stand five minutes and matched in the indoxymeter with the proper color disk When the indoxyl content of blood serum is determined, the serum is first treated with 20% of its volume of trichloroacetic acid and then the procedure above is followed —**A GRIGAUT** *Bull Biolog Pharm* through *Pharm Weekblad*, 72 (1935) 939 (E H W)

PHARMACEUTICAL ABSTRACTS

EDITOR A G DuMEZ, 32 S Greene Strcet, Baltimore Maryland

ABSTRACTORS

WILLIAM B BAKER
GERSTON BRUCH
ARTHUR H BRYAN
HENRY M BURLAGE
ALBERT H CLARK
ZADA M COOPER
GUSTAV E C WALINA
AMELIA DeDOMINICIS
MELVIN F W DUNKER
GEORGE W FIERO
PERRY A FOOTE
RALPH R FORAN
SAMUEL W GOLDSTEIN
H B HAAG
G W HARGREAVES
WILLIAM H HUNT
CASIMER T ICHNIOWSKI

ROLAND E KREMERS
CLIFFORD S LEONARD
L LAVAN MANCHEY
ARTHUR E MEYER
A PAPINEAU COUTURE
W ARTHUR PURDUM
HARRY ROSEN
A S SCHWARTZMAN
EMANUEL V SHULMAN
EDGAR B STARKEY
MARVIN R THOMPSON
E G VANDEN BOSCH
GLENN S WEILAND
ANNA E WHITE
ELMER H WIRTH
THOMAS G WRIGHT
MAX M ZERVITZ

CONTENTS

Chemistry

Analytical	294
Toxicological Chemistry	317

Pharmacognosy

Vegetable Drugs	317
Animal Drugs	319

Pharmacy

Galenical	319
Pharmacopœias and Formulæries	325
Non-Official Formulæ	325
Dispensing	331
Pharmaceutical History	332

ANALYTICAL

Albumin Tannate The properties of various commercial albumin tannate preparations are compared with those of Tannalbin, Knoll The moisture content, water solubility, ignition residue, solubility in pepsin-hydrochloric acid and the solubility in 1.5% sodium carbonate of the residue not digested by pepsin hydrochloric acid as well as that of the substance *in toto* are reported The tested preparations display a number of differences from Tannalbin Different specimens of the latter product show some variability Albumin tannate preparations are less soluble in pepsin-hydrochloric acid and in sodium carbonate solution and have lower tanning content than the Tannalbin When made by the method of the Netherlands Phar, IV or V, albumin tannate is too soluble in pepsin-hydrochloric acid A substance with the desired properties may be prepared by increasing either the temperature to which the solution of tanning mixed with albumin is heated or by increasing the duration and temperature of the process of hardening Hardening of the dry material may be omitted if the solution is boiled for a couple of hours Of eight foreign (non-Danish) commercial albumin tannate preparations tested only one had properties sufficiently similar to those of Tannalbin to serve as a substitute —F REIMERS *Dansk Tids Farm*, 9 (1935), 153 (C S L)

Alkaloid-Containing Poisonous Drugs—Detection of, in Powdered Drugs The following method is proposed Moisten thoroughly a triturate of the finely powdered drug and 20 Gm powdered slaked lime with 12 cc water extract the mixture in a small flask with 20 cc of 90% alcohol for 1 hour with vigorous shaking and warming on a water-bath separate the alcohol extract from the drug lime mixture by means of a small flat filter and wash the contents of the filter with 10 cc alcohol Evaporate the filtered extract and wash alcohol, take up the residue with 10 cc water and 3 drops of dilute sulphuric acid in the cold, filter the solution of fat resins and in soluble matter (calcium sulphate) through a small moistened filter and rinse the filter with some drops of water Divide the filtrate on 3 watch glasses and 2 small porcelain dishes, evaporate each to dryness and carry out the following precipitations and color reactions for alkaloids (1) Dissolve two of the residues on the watch glasses in some drops of water and treat one with some drops of tannic acid solution (German Phar VI, page 764) and the other with some drops of iodine potassium iodide solution (see German Phar VI under iodine solution page 765 and page 780) Gray brown or red brown amorphous precipitates indicate the presence of alkaloids Take up the residue in the third watch glass with some drops of water and a drop of dilute sulphuric acid and add two drops of potassium-mercuric iodide solution In this case the usual Mayer's reagent is not employed but Boehm's reagent, a highly concentrated solution of red mercuric iodide in concentrated potassium iodide solution in such proportions that the formula is $2KI \cdot HgI_2$ and is prepared by dissolving 33.11 Gm potassium iodide and 45.28 Gm mercuric iodide in 33.11 Gm water with some shaking (specific gravity 2.1694 at 15° C) This reagent yields with bases containing trivalent amino nitrogen white yellow precipitates and with quaternary ammonium bases of pentavalent-nitrogen highly colored yellow precipitates (2) the residues in the porcelain dishes are subjected to the following color reactions (a) Take up the residues with 2-3 drops of concentrated sulphuric acid which might not be colored characteristically If it remains colorless add to one dish some particles of fine sugar whereby characteristic colors might appear (b) Scatter a trace of finely powdered potassium dichromate which produces at the most a weak green color caused by the chromic sulphate formed in closing single small crystals but not colored streaks flowing from the crystals or odors like benzaldehyde cumarin spirea or the like In cases of positive reactions a microscopic examination of the drug will give a clearer idea of the nature of the alkaloidal admixture —H KUNZ KRAUSE *Apoth Ztg*, 50 (1935) 862-864 (H M B)

Alkaloids—Determination of, in Injectable Solutions All of the common alkaloids used in solutions for injection were studied to determine the best methods of assay Results were as follows Adrenaline gives most accurate results when determined by the described Atherton Seidele colorimetric method or by the photometric method, atropine by titration with periodic acid, caffeine by iodometric determination, cinchonine by gravimetric method, emetine by titration with acid novacaine by retitration after titration with acid, pilocarpine by iodometric determination quinine by colorimetric determination, sparteine by retitration, strychnine by use of periodic acid, yohimbine by retitration —G N THOMAS and D JATRIDE *J pharm chim*, 21 (1935) 585 (M M Z)

Alkaloids—Rotatory Power of Various Rotatory powers of the various alkaloids included in the French Codex (except quinine and its salts) were determined for the yellow sodium line and for the yellow, green, blue and violet mercury lines, as follows

Alkaloid	Yellow Sodium α 5893	Yellow Hg α 5780	Green Hg α 5400	Blue Hg α 4358	Violet Hg α 4046	α 5460/ α 5780
Cocaine HCl	+ 72 30°	+ 75 53°	+ 84 11°	+144 48°	+168 46°	1 113
Codeine	-134 9°	-142 54°	-163 55°	-284 61°	-346 21°	1 147
Heroin-HCl	-148 35°	-156 37°	-174 91°	-308 49°	-361 11°	1 118
Picrotovine	- 30 05°	- 31 37°	- 36 42°	- 63 52°	- 80 12°	1 161
Emetine HCl	+ 53 85°	+ 57 04°	+ 60 49°	+ 85 69°		1 06
Pilocarpine-HCl	+ 89 09°	+ 94 63°	+108 61°	+181 53°	+230 97°	1 20
Pilocarpine-HNO ₃	+ 81 46°	+ 84 96°	+ 97 21°	+168 68°	+211 16°	1 193
Scopolamine HBr 3H O	+ 22°	+ 23 75°	+ 26 75°	+ 53 75°	+ 56 75°	1 126
Eserine (base)	- 78 97°	- 84 11°	- 94 13°	-133 01°	-161 37°	1 119
Eserine salicylate	- 78 87°	- 84 96°	- 99 26°	-179 35°	-251 92°	1 169

CH LORMAND and P GESTAU *14me Congrès de Chimie Industrielle, Paris* (Oct 21-27, 1934), 3 pp (A P-C)

Anesthetics With Special Reference to Cocaine and Novocaine in Illegal Trade This paper is one of a series covering the detection of cocaine in combination with other anesthetics, in which combinations it often appears in illegal traffic. Several of these papers published in the *Pharm Weekblad* in 1934 are abstracted in the *YEAR BOOK of the AM PHARM ASSOC*, 23 (1934). The paper outlines a general scheme for the examination of samples: (1) the numbing effect as well as (2) the taste (tasteless, bitter, sour) should be observed. (3) The general appearance is of importance. The following anesthetics are amorphous: Acoine-HCl, alypine, orthoform N, propaesine and tutocaine. The following appear amorphous but are also hygroscopic: Allylcocaine HCl (nycaine), psicaine new (tartrate). The following are granular: Cocaine HNO₃, psicaine, eucaine A and B, butelline and subcutine. The following exhibit beautiful crystals: Cocaine-HCl (highly refractive), larocaine, novocaine, ecognine and benzoecognine. The following occur in finer crystals: Pantocaine, stovaine and tropacocaine and in very fine crystals: Alypine nitrate, holocaine, anaesthesine, psicaine-new-HCl, orthoform and cycloform. The following show a tendency to clump together: Allylcocaine nitrate, diocaine and percaine. (4) With reference to the reaction toward litmus paper the following show a neutral reaction: Alypine nitrate, butelline, diocaine, eucaine-A, eucaine B, novocaine, nycaine, orthoform, orthoform new, percaine, propaesine and tropacocaine and the following show a weakly acid reaction: Acoine, allylcocaine nitrate, alypine (very weak), anaesthesine, cocaine-HCl and cocaine-HNO₃, cycloform (very weak), larocaine, pantocaine, psicaine, psicaine-new-HCl, psicaine new-tartrate, tutocaine, stovaine (weakly acid toward Congo paper), subcutine (strongly acid) and holocaine (alkaline). (5) The solubility in water is often an indication of identification. The following are easily soluble in water: Allylcocaine nitrate, alypine-HCl, alypine nitrate, cocaine HCl, larocaine, novocaine, nycaine, pantocaine, percaine, psicaine, psicaine new-tartrate, psicaine-new HCl, stovaine and tropacocaine. The following are fairly soluble in water: Acoine, butelline, cocaine-HNO₃, diocaine, eucaine-B, tutocaine. The following are poorly soluble in water: Anaesthesine, cycloform, eucaine-A, holocaine, orthoform, orthoform new, propaesine and subcutine. (6) Eucaine-A is insoluble in alcohol and holocaine, psicaine, tutocaine, tropacocaine and novocaine are slightly soluble in alcohol. (7) The following are only slightly soluble in 0.5 N hydrochloric acid: Diocaine, holocaine, psicaine-new-HCl, tropacocaine and cocaine-HNO₃. (8) Reactions for acid radicals are as follows: Butelline gives a reaction for SO₄; allylcocaine nitrate, alypine nitrate, cocaine nitrate and novocaine nitrate give reactions for NO₃; psicaine and psicaine new give reactions for tartaric acid, subcutine gives a reaction for sulfophenylic acid. The following give no reaction for acid radicals: Anaesthesine, cycloform, orthoform, orthoform new and propaesine. The remaining anesthetics give reactions for Cl'. (9) With the reaction with potassium dichromate and strong hydrochloric acid, primary aromatic amines give a purple color, the benzoyl group gives a yellow resin and pantocaine gives a greenish resin accompanied by a considerable odor. (10) The lignin test (with paper) on primary aromatic amines shows the following reactions: without acid, very good—anaesthesine

and subcutine without acid good—orthoform and orthoform-new without acid fairly good—cycloform and propasine with acid very good—anæsthesine, subcutine, orthoform, orthoform new, cycloform and propasine, with acid fairly good—butelline, larocaine, novocaine and tutocaine (11) The reaction of Denigès-Marquis All phenols are colored at temperatures below 100° Orthoform, orthoform new, subcutine and ecgonine The following phenol-ethers react Acoine, diocaine holocaine (after 24 hours), percaïne, anæsthesine, cycloform and propasine Reactions on the benzoyl group (Denigès) are given by the following Allylcocaine nitrate alypine, benzoyllecgonine, cocaine-HCl, eucaine A, eucaine-B, nycaine, psicaine, psicaine new-HCl, psicaine new-tartrate, stovaine and tropacocaine Aypine-nitrate and cocaine nitrate do not give a reaction (12) The following reactions are given with ferric chloride Orthoform becomes violet-yellowish brown dirty green, orthoform-new becomes green violet-yellowish brown and subcutine becomes purple Among the phenols and phenol ethers, acoine becomes reddish brown, ecgonine red diocaine brown holocaine brown and percaïne yellowish brown (13) Two tables of melting points for 38 anæsthetics are given, one alphabetical and one according to melting points (14) Optical rotation is also of importance Tables for $[\alpha]_D^{20}$ are given The series of papers is to be continued —C OFFERHAUS and C G BAERT *Pharm Weekblad*, 72 (1935) 801 (E H W)

Argyrol, Collargol, Electargol and Protargol—Reactions for the Differentiation of (1) Mix 2 cc of a 0.5% solution of chromic acid with 7–8 cc of the dilute solution of the silver preparation and add 0.5 cc of a saturated sodium bicarbonate solution Argyrol first flocculation, later a clear yellow color Collargol a reddish precipitate Electargol like collargol Protargol like argyrol but more turbid (2) Mix one cc of 10% sodium thiosulphate solution with 9 cc test solution and add phenolphthalein Argyrol dark yellow color turning black Collargol and electargol violet to black precipitate Protargol pink to red color (3) Mix 0.5% solution of chromic acid with nitric acid and add the silver preparation Electargol the yellow liquid turns slowly to blue The other compounds do not give that reaction (4) Picric acid precipitates the latter three compounds —CH VAILLE *Rev centro estud farm bioquím*, 25 (1935) 247 (A E M)

Atropine—Study of Commercial Drugs Containing Fifty-seven atropine containing commercial preparations were assayed by observing the dilatation produced in the pupil of the white mouse Most of the preparations were also assayed chemically Comparison of the two methods indicated whether the preparations contained pure atropine (I), hyoscyamine (II) or a mixture thereof II has 2.23 times the mydriatic effect of I in mice by subcutaneous injection A 1% aqueous solution of I-sulphate kept for 2.5 months at room temperature in the dark lost 20% of its activity A 1-mg % aqueous solution kept in an incubator at 37°, was found to be inactive after 4 months —H A OELKERS and E VINCKE *Arch expl Path Pharmacol*, 178 (1935) 439, through *Squibb Abstr Bull*, 8 (1935), A 968

Azulenogenic Sesquiterpenes—Color Reaction of The greenish blue color reaction given by Bourbon geranium oil and imperfectly purified rhodinols with a chloroformic solution of bromine is due to an azulenogenic sesquiterpene which can be isolated from geranium oil, and which boils under 5 mm pressure at 117° to 120° has a refractive index at 20° of 1.5021, specific gravity at 15° of 0.9134, rotatory power (in a 1 dm tube) of +11.40° (the sign of rotation was probably reversed by heating with boric acid to fix and separate the alcohols) and molecular refraction 66.2 (calculated 66.13) Azulenogenic sesquiterpenes are very widely distributed in nature they are present in a large number of essential oils in which they can readily be detected by the chloroformic bromine test —SÉBASTIEN SABETAY and HERMINE SABETAY *14me Congrès de Chimie Industrielle, Paris* (Oct 21–27 1934), 3 pp (A P C)

Bath Preparations XIV Fifteen commercial preparations are tested and studied from the following points (1) manufacturer, (2) how packed (3) price (4) physical properties, (5) reaction (6) dry residue, (44–91.9%), (7) mineral matter (1.2–15.7%) (8) sulphur dioxide (4 positive), (9) Hirst-Procter reaction (4 positive) (10) 5 volatile oil (0.2–2.5%, 2 negative), (11) appearance under the ultraviolet lamp (12) appearance of the capillary streak in ordinary and ultraviolet light and (13) appearance and color of the aqueous solution (1.10) A second table lists a pine needle bath a ladies' bath rheumatism, morning evening and children's bath giving (1) appearance (2) odor, (3) specific gravity (4) dry residue (5) mineral matter, (6) % volatile oil (7) special properties and value and (8) chief constituent —W PEYER *Apoth Ztg*, 50 (1935) 658–661 675–678 (H M B)

Bath Preparations—XV Foot Baths Twelve preparations were examined and reports made with regard to (1) manufacturer, (2) price, (3) physical properties and (4) qualitative and quantitative analysis—W PEYER and R STADLER *Apoth.-Ztg.*, 50 (1935), 924-927

(H M B)

Bellier Number—Study of Its Use for the Detection of Peanut Oil in Olive Oils The following definition is proposed for the Bellier number the temperature of initial crystallization of the solid fatty acids of a fat or oil in alcoholic solution, when the solution is subjected to progressive cooling with constant agitation. A recommended technique for carrying out the test is described in minute detail, more particularly as regards the cooling, it is essentially as follows to 1 cc of well clarified oil or fat in a 26-27-mm by 22 cm test-tube add 5 cc of alcoholic potash (75 Gm per l), saponify by careful heating using an air-cooled reflux condenser, cool to 30° to 35°, add 1.5 cc of 1 + 2 acetic acid and 50 cc of 70% alcohol, close the tube with a rubber stopper carrying a semi-precision thermometer graduated from 0° to 60° or 0° to 100° and note the temperature at which the solution becomes cloudy due to crystallization. The test may be repeated on the same portion of sample, but in order to obtain concordant results the temperature must be raised each time about 15° to 20° above the clouding point. The precautions which must be taken in the preparation of the reagents and in the manipulative operations are described. The Bellier number of peanut oil is generally given as 40° to 41° and that of pure olive oil as 11.8° to 14.5°. Examination of a number of oils of known purity gave values of 9.5° to 18° the high values being obtained with Tunisian and Moroccan oils, oils obtained by extraction of press cake gave values of 9° to 16.5°. For the detection of peanut oil in doubtful cases, mix 9 parts of sample with 1 part of peanut oil (both by weight) and determine the Bellier number, with pure olive oil the value will not exceed 20° (except in extremely rare instances). By drawing a curve of the Bellier number of mixtures of peanut and olive oils, admixture of olive oil in peanut oil can also be detected and estimated quantitatively. If a mixture of 9 parts of the supernatant oil of canned fish and 1 part of peanut oil gives a Bellier number above 19.5°, the presence of peanut oil in the canning oil is indicated. As the Bellier number depends on the solid acids of oils, it might be deduced that its value was proportioned to the solid acids content of olive oils, with the proviso that the oils compared contain solid acids of the same type, of which there are two acids separating as arborescent crystals and giving lead salts that are completely soluble in warm ether, and acids separating as glomerule shaped crystals giving lead salts that are only partially soluble in warm ether. Some olive oils contain practically exclusively one or other type of acids while others contain both. As the solid acids are insoluble in 70% alcohol, it is suggested that they might be separated by the technique of the preparation of the Bellier test followed by cooling overnight at 10° to 12° and then for 1 hour at 5°, centrifuging, filtering and determining the acids by weighing or acidimetric titration. The quantitative composition of a mixture of solid acids, the nature of which is known could be obtained by determination of the Bellier number and comparing with curves prepared from the Bellier numbers of known mixtures of the same acids. Oils extracted from olive press cake when subjected to the Bellier test and then allowed to stand over night at 20° to 25°, contain a suspended flocculent precipitate which gradually gathers at the top of the liquid. This test, though possibly not absolutely specific, is very characteristic and permits of detecting the addition of from 5 to 20% (according to the origin) of such extracted oil in pressed oil—R MARCILLE *14me Congrès de Chimie Industrielle, Paris* (Oct 21-27, 1934), 13 pp

(A P C)

Benzene—Ultra-Violet Absorption Spectrum of Utilization for the Detection and Determination of Small Amounts of Benzene in the Atmosphere The benzene is absorbed by passing the dried atmosphere through 95% alcohol at -85°. The absorption spectrum curve is obtained by Fabre and Amy's technique of the imbricated spectra method. As little as 0.1 mg benzene per liter of air can be determined with an accuracy of about 5% (in absence of homologs) on a 1-liter sample. The method is absolutely specific. The method is sensitive to about 1 part benzene in 100,000 parts of alcohol—PIERRE LAURIAN *14me Congrès de Chimie Industrielle, Paris* (Oct 21-27, 1934), 6 pp

(A P C)

Benzoic and Cinnamic Acids—Identification of, in Microsublimates of Balsams and Resins The recognition is accomplished by the addition of 4-5 drops of dilute sulphuric acid and then some sodium amalgam to a portion of the sublimate when benzoic acid is reduced to benzaldehyde. For cinnamic acid, a portion is treated with chromic acid or permanganate to oxidize it to benzaldehyde. The benzaldehyde is precipitated in a hanging drop slip containing *p* nitrophenylhydra-

zine (freshly prepared saturated solution in 15% acetic acid) The melting point of the hydrazone is 190–192° C The reaction is sensitive to 10 micrograms of benzoic acid and 20 micrograms of cinnamic acid —R FISCHER *Pharm Zentralh*, 76 (1935) 345 (E V S)

Bismuth—Assay of National Formulary Preparations Containing Report is made of a study undertaken to determine whether the method of assay used for the glycerite might be applied to determination of bismuth content of Solution of Bismuth, Elixir of Bismuth, Elixir of Pepsin and Bismuth and Elixir of Pepsin, Bismuth and Strychnine and also whether other methods could be used advantageously Reference is made to the various methods which have been used for the quantitative determination of bismuth In the present investigation a comparative experimental study of the official sulphide method, of the Mayer phosphate method and of the Schoeller and Waterhouse phosphate method was undertaken Detailed procedures are given Two samples of each preparation were assayed by each of two different people by the sulphide method and the Mayer phosphate method The Schoeller-Waterhouse phosphate method was abandoned because it seemed to yield slightly high results Either the sulphide method or the Mayer phosphate method yields accurate and comparable results when applied to glycerite, solution or elixirs of bismuth Since the Mayer phosphate method is simple and accurate it might well replace the sulphide method now official for the glycerite and be made official for the solution and elixirs —GLENN L JENKINS and SYLVIA MILLETT *J Am Pharm Assoc*, 24 (1935), 561 (Z M C)

Borax-Glycerin-Water Solutions—Reactions of When glycerin is added to a solution of borax a portion of the boric acid is converted into boroglycerin The conversion is dependent upon the concentration of the glycerin The reaction increases in acidity with an increase of free boroglycerin With a certain concentration of glycerin the amount of free boroglycerin should be just sufficient that the acidity of the solution will neutralize the alkalinity of the borax In order to determine which concentration of glycerin in combination with a concentration of borax will react neutral, the author made the following determinations

Percentage of Glycerin in the Solution		(2%)	Percentages of Borax (6%)	(10%)
85.8	p_H	4.8	4.9	5.0
60	p_H	5.25	5.4	5.45
40	p_H	5.75	5.9	6.05
30	p_H	6.10	6.25	6.45
20	p_H	6.55	6.75	7.05
10	p_H	7.25	7.60	8.0
5	p_H	7.90	8.3	8.7
0	p_H	9.2		

These determinations, made at about 15° show that a 20–25% solution of glycerin in borax solution reacts neutral —P VAN DER WIELEN *Pharm Weekblad* 72 (1935), 877 (E H W)

Bromides—Detection of Small Quantities of, in Sodium Chloride Mix 10 cc of water with one drop of a saturated solution of fuchsine and add drop by drop a solution of chlorine in water Note how many drops are needed to destroy the red color For the test use 10 cc of a saturated solution of the sodium chloride Add a drop of fuchsine solution and the double quantity of chlorine water then determined A reddish tint turning violet indicates bromine The reaction is sensitive to 0.1 mg potassium bromide —R CASARES LÓPEZ *Farm Moderna*, 46 (1935), 55 (A E M)

Bromine—Electrometric Determination of, in the Presence of Large Amounts of Chlorine The method permits the determination of 0.24 mg bromine in the presence of large amounts of chlorine Chlorides are removed by means of acetone The analysis of aqueous solutions is relatively simple, but it is applicable also to biological substrates after removal of proteins, this being effected by moist incineration The reduction of silver chloride and bromide by means of sodium amalgam produces a rapid and complete conversion of the halogens to soluble sodium salts The lower limit of bromine detected in tissue by this method was 5 mg % —G E VLADI MIROV and J A EPSTEIN *Mikrochemie*, 18 (1935), 58 (L L M)

Butterfat—Determination of, in food A method was proposed for the isolation of fat A weighed amount of paraffin equivalent to about one-third the weight of fat expected is added to the sample and the mixture hydrolyzed with hydrochloric acid Filter cell and ice water are added and the mixture filtered through linen coated with filter cell in a Buchner funnel The

precipitate is transferred to a beaker, dried, pulverized and treated with anhydrous sodium sulphate and petroleum ether and the extract filtered through asbestos in a Knorr tube. Four extractions are made and the combined filtrates evaporated to dryness and weighed. Correction is made for the added paraffin. Advantages cited are the fat is extracted from the dried material with a single solvent, emulsions are avoided and the use of larger quantities of materials are possible. F HILLIG *J Assoc Official Agr Chem*, 18 (1935), 454 (G S W)

Cæsium—New Spot Reaction for Gold and platinum bromides yield with cæsium salts a black precipitate useful in the detection of cæsium by the spot method. Analysis of the black triple salt indicated the formula $\text{Cs}_2\text{Au}_2\text{PtBr}_{12}$. For the detection of small quantities of cæsium in the absence of rubidium the use of concentrated reagents is recommended. If rubidium is present the best results are obtained with a solution containing 3% gold and 1.5% platinum. A drop of the reagent is touched to a piece of paper and to the spot is added a drop of the test solution. In the presence of cæsium, a gray to black spot is produced. 0.25 γ per cu mm can be detected. With the exception of rubidium in concentrations above 2%, the chlorides of rubidium, potassium, sodium, lithium and ammonium do not interfere. Cæsium may be estimated quantitatively by the spot method with an accuracy of 5–10% —E S BURKSER and M L KUTSCHMENT *Mikrochemie*, 18 (1935) 18 (L L M)

Caffeine—Determination of, in Decaffeinated Coffees. The following method is recommended. mix 50 Gm of ground, roasted decaffeinated coffee with glass wool cut into short lengths, introduce directly into a Soxhlet extractor between two wads of glass wool (avoid packing tightly), extract for 5 hours with slightly moist chloroform, adding during the first and third hours 3 cc of 20% ammonia when the extractor has just been siphoned, evaporate to pasty consistency on the water-bath (using suction to remove the last trace of solvent), add successively 75 cc water, 20 cc of 10% sulphuric acid and 1.5 Gm of paraffin having a melting point of 60° to 62°, heat 20 minutes on the water-bath with occasional stirring, let stand over night in the refrigerator at 5°, filter in the refrigerator, make the filtrate alkaline with ammonia and evaporate to dryness on the water bath, break up the residue with a nickel spatula, take up 4 times with anhydrous chloroform, filter, evaporate to dryness on the water-bath, dissolve in 30 cc of boiling water, add 1% potassium permanganate solution to permanent violet coloration, let stand on the water-bath 15 minutes (adding permanganate if the color disappears), discharge the color by dropwise addition of 3% hydrogen peroxide containing 1% of acetic acid, filter if necessary, extract with 4–30 cc portions of pure chloroform (recovered chloroform is not advisable), evaporate the chloroform, dry at 90° to 100° for 15 minutes and weigh. Duplicate determinations agree within 1 mg (on a total weight of 12 to 20 mg). The caffeine obtained is white, fairly pure and melts at 220° to 225° (Maquenne block). If the technique is not strictly followed, there may remain small amounts of fat, which can be eliminated by another permanganate purification, this produces a loss of 1 to 1.5 mg of caffeine which should be corrected for —A FAURE and R PALLU *14me Congrès de Chimie Industrielle, Paris* (Oct 21–27, 1934), 4 pp (A P -C)

Carbon and Hydrogen—Preheater for the Microanalytic Determination of. A description of the apparatus with diagram —W F BRUCE *Mikrochemie*, 18 (1935), 103 (L L M)

Carbon Dioxide—Determination of, in Confined Atmospheres. The principle of the method consists in shaking a given volume of the atmosphere with a hydro alcoholic solution of rosaniline decolorized by hydrazine, and comparing the color with those obtained by similar treatment of samples of known carbon dioxide contents. To simplify the method from the standpoint of sanitary control, comparison may be made with the color obtained with an atmosphere having a carbon dioxide content that is at the limit of safety —RENÉ DUBRISAY and LÉON GION *14me Congrès de Chimie Industrielle, Paris* (Oct 21–27, 1934), 2 pp (A P -C)

Charcoal—Activated. Demand for a charcoal with greater adsorptive powers was responsible for the study reported. Adsorbent carbons may be produced in several ways, one of the most promising being that of carbonizing sulphite waste liquor from the pulping of wood for paper. Activation is usually resorted to this usually involving some chemical treatment. A number of tests for purity, that is freedom from toxic or inert substances are given. The German Phar has a carbon with an adsorption capacity of 0.525 Gm of methylene blue per Gm of carbon. The Swiss Phar has one with capacity of 0.24 Gm of methylene blue per Gm of carbon. Saturation of carbon is best obtained by reliance on the mass effect of an excess of dyestuff. The following is the method finally decided upon. "Dissolve 0.25 Gm of methylthionine chloride (methyl-

ene blue) in enough distilled water to make 250 cc of solution Measure exactly 50 cc of the solution, at 25° C, into each of two 100 cc glass stoppered flasks To one flask add exactly 0.25 Gm of Activated Charcoal, stopper the flask and shake vigorously for five minutes Filter the contents of each flask through a filter which has not been previously moistened, rejecting the first 20 cc of each filtrate Measure exactly 25 cc of each remaining filtrate into 250 cc volumetric flasks Add to each flask 50 cc of a solution of sodium acetate (1 in 10) and mix thoroughly, then add from a burette 35 cc of *N/10* iodine, keeping the mixture in constant rotation Stopper the flasks and allow them to stand for fifty minutes, shaking vigorously at intervals of ten minutes Dilute each mixture to exactly 250 cc with distilled water, mix thoroughly, allow to stand for ten minutes and filter each through a filter that has not been previously moistened, rejecting the first 30 cc of each filtrate Determine the excess of iodine in 100 cc of each filtrate by titration with *N/10* sodium thiosulphate The difference between the two titrations multiplied by 5, amounts to not less than 3.5" An important use of activated carbon is thought to be adsorption of gaseous products of fermentation or putrefaction and experiments led to adoption of the following "Into each of two flasks place 185 cc of distilled water and 5 cc of glacial acetic acid and mix thoroughly By means of a pipette add to each flask 10 cc of a solution of 2.5 Gm of crystallized sodium sulphide in 100 cc of distilled water placing the tip of the pipette at the bottom of the flask during delivery Rotate the flask gently for thirty seconds, add to one of the flasks 1 Gm of Activated Charcoal, stopper the flasks and shake them for five minutes Filter the contents of each flask through a filter that has not been previously moistened, rejecting the first 20 cc of each filtrate Titrate 100 cc of each subsequent filtrate with *N/10* iodine using starch T.S. as the indicator The filtrate from the Activated Charcoal consumes at least 5 cc less of *N/10* iodine than the filtrate from the solution to which no Activated Charcoal was added" Response of charcoals to the proposed tests to be included in U.S.P. XI is given for sixteen different carbons—JOSEPH ROSIN, GEO. D. BEAL and CHESTER R. SZALKOWSKI *J. Am. Pharm. Assoc.*, 24 (1935) 630

(Z. M. C.)

Chaulmoogra Oil in the Pharmacopœias and in Commerce The lower limit of acidity and the upper limit of optic rotation should be suppressed A 10% solution of 10 Gm oil in a total volume of 100 cc in chloroform investigated with sodium light should give, at room temperature in a 10 cm tube, a rotation of 5°12'—A and C CHALMETA *Farm. Moderna*, 46 (1935), 63 and 94

(A. E. M.)

Chloral Formamide—Melting Point of The melting point of Chloral Formamide B.P.C. is given as between 114° and 115° C, which is the same as that in the B.P. 1914 However, as the result of several experiments the authors recommend that the melting point should be recorded as 124° to 126°, with limits for pharmaceutical purposes between 122° and 126° In determining the melting points, the values given are the mean temperature of melting, the transition range in most instances being one to two degrees It is suggested that the recorded melting points represent the temperature of sintering possibly of impure material—C. T. BENNETT and N. R. CAMPBELL *Pharm. J.* 134 (1935), 795

(W. B. B.)

Chloroform and Carbon Tetrachloride—Differentiation between The author comments on the recent article of Rozeboom (*Pharm. Weekblad*, 72 (1935), 689) in which a reaction depending upon the solubility of papaverine hydrochloride in chloroform is used to differentiate between chloroform and carbon tetrachloride Quinine sulphate may be employed in similar manner The author suggests the two following reactions for distinguishing between chloroform and carbon tetrachloride (1) *Positive for Chloroform*—When boiled with Fehling's solution the sample with the chloroform will show reduction that with the carbon tetrachloride will not (2) *Positive for Carbon Tetrachloride*—Heat 1 drop (no more!) in a test-tube lightly closed with a cork The vapors will be oxidized by the air Only carbon tetrachloride will liberate chlorine (CoCl₂) After cooling shake with a few cc of water and add potassium iodide starch solution A blue color will result—N. SCHOORL *Pharm. Weekblad*, 72 (1935), 751

(E. H. W.)

Chromatographic Adsorption Analysis in Pharmacy Rum was colored with caramel and then allowed to run through a vertical column of a suitable adsorbent (aluminum oxide) Untreated rum left its coloring matter on the top layer of the aluminum oxide, the rest of the column remaining perfectly white The rum colored with caramel produced more or less faded zones throughout the entire column The filtrate was practically colorless One half per cent solutions of natural and synthetic balsam of Peru in alcohol and in petroleum ether were prepared They

were treated as described above. The results show that the constituents in the natural and synthetic balsams are not the same, being retained differently by the aluminum oxide. Colorless constituents of preparations may in some cases be brought to view by examination of the aluminum oxide column under a quartz analysis lamp. Official tincture of digitalis prepared with absolute alcohol was compared with a tincture prepared with diluted alcohol. Marked differences are apparent in the appearance of the aluminum oxide column. A review of the literature of adsorption analysis is given.—VALENTIN *Pharm Ztg*, 80 (1935), 469 (G E C)

Citronellal—Determination of, in Java Citronella Oil Dutch Standard Method. The following method will be used as a standard for the determination of citronellal in Java citronella oil. Into a 150 cc flask weigh accurately about 2 Gm of Java citronella oil, add 10 cc of 95% alcohol and 20 drops (1 cc) of 0.1% alcoholic bromophenol blue solution and make neutral with 0.1N potash. To the neutralized liquid add from a burette or an automatic pipette 20 cc of 0.5N alcoholic potash and immediately afterward from a measuring glass 20 cc of a 5% alcoholic hydroxylamine hydrochloride solution. Shake, allow to stand at room temperature for an hour (under European conditions, at the much higher temperature in the Dutch East Indies a quarter of an hour is quite sufficient) and titrate the excess of potash with about 0.5N (alcoholic) hydrochloric acid, until the color of the indicator changes to greenish yellow, comparing the color with that of a blank determination made in the same way. The result is calculated from the following formula:
$$\text{per cent of citronellal} = \frac{(b-a) \times n \times 15.4}{g}$$

where b = volume in cc hydrochloric acid required for blank determination, a = volume in cc of hydrochloric acid required for titration, n = normality of hydrochloric acid and g = weight, in grams, of oil taken.—ANON *Perf Ess Oil Rec*, 26 (1935), 253 (A C DeD)

Cocaine—Separation and Detection of, in Mixtures of Cocaine and Procaine Two methods are given for the separation and identification of small quantities of cocaine-HCl when a large amount of procaine-HCl is present. One method is given for the detection of small quantities of cocaine, free base, when a large amount of procaine, free base, is present. One method is given which is suitable for estimating within 4 mg the amount of cocaine or cocaine-HCl present in a mixture of procaine, free base or salt, and cocaine, free base or salt. All of these methods are based on the fact that a buffer of proper acidity will cause the formation of a water-soluble salt of procaine and will not affect cocaine. All methods given separate the cocaine as the free base and do not affect its molecular structure, thus permitting the identification of pure cocaine and not its decomposition products.—C H RILEY *Am J Pharm*, 107 (1935), 270 (R R F)

Cod Liver Oil—Determination of, in Emulsions Weigh exactly 2 Gm of emulsion in a 50-cc beaker and add 8 cc of 10% hydrochloric acid. Cover the beaker with a watch glass and heat for a half hour on a water-bath. Agitate the contents for a quarter hour, then transfer the liquid with 10 cc of alcohol into a graduated vessel, shake vigorously for one minute and leave until it separates into two layers. Fill up nearly to the top graduation with petroleum ether, shake for a half minute and allow to stand for one hour. Withdraw 40 cc of the solution with a pipette into a tared flask, distil the ether and heat for a half hour in an oven. Weigh, then heat again for a half hour and check the weight.—W LEPPER *Z Analyt Chem*, 98 (1934), 164-166, through *Chimie et Industrie*, 33 (1935), 676 (W A P)

Colorimetric Analysis and p_H Determinations—Applicability of the Color and Luminescence Comparator of Rojahn-Heinrich for A discussion Illustration.—R SEIFERT *Apoth Ztg*, 50 (1935), 590-593 (H M B)

Colorimetric Methods of Analysis—Theory and Physico-Chemical Basis of Assuming that color is numerically measurable in order that a reaction may be used it is necessary to define the colorimetric function $I = f(C)$, which gives the relationship between the color intensity I and the initial concentration C of the substance to be determined. I is really a function of numerous variables (temperature, time, concentration of reagent, operating technique) to which suitably selected values must be assigned. The methods of selecting these values are discussed and exemplified by the case of the microdetermination of reducing sugars by means of phosphomolybdic reagent. The same procedure would be suitable in all cases more particularly for the elaboration of methods for detecting toxic gases.—ISTRIN *14me Congrès de Chimie Industrielle Paris* (Oct 21-27, 1934), 10 pp (A P C)

Copper—Drop Method of Detection of A few cc of solution are heated for 1-1.5 minutes

with tin and hydrochloric acid, the solution is poured off, the tin washed and boiled for 1 minute with 15 cc of 65% nitric acid, the solution diluted and 0.2 cc of saturated aqueous sodium fluoride, 0.2 Gm of zinc sulphate and 0.3 cc of saturated aqueous $(\text{NH}_4)_2\text{Hg}(\text{CNS})_4$ are added, when a lilac precipitate of $\text{ZnHg}(\text{CNS})_4$, $\text{CuHg}(\text{CNS})_4$ indicates $< 10^{-7}$ Gm copper Cobalt, lead, iron tin, arsenic, antimony and bismuth do not interfere — L M KULBERG *J Appl Chem Russ*, 7 (1934), 1079, through *Squibb Abstr Bull*, 8 (1935), A-957

Cresol Soap Solution—Determination of Cresol Content of H's method previously proposed (*Apoth Ztg*, 49 (1934), 183) is not applicable to cresol soap solutions containing acids of castor oil and its derivatives since these are not separated from the phenolic constituents The following procedure is recommended whereby the resin and fatty acids are separated by alkaline lead acetate solution Shake a mixture of 30 Gm lead acetate solution (20%), 50 Gm sodium hydroxide and 20 Gm water with 20 Gm cresol soap solution for 1 minute In 60 Gm of the filtered liquid in a cassia flask dissolve 20 Gm sodium nitrate, decompose this solution with 20 Gm nitric acid and then proceed by the method previously reported above For soap solutions containing chlorcresols the method previously described is modified Before the decomposition of the alkaline solution by hydrochloric acid, add 5 cc benzoin in order to bring about an easy separation of the heavy halogen phenols (chlorcresol and chlorxylenol) from the salt solution After subtracting the added volume of benzoin from the volume observed the % cresol may be calculated in the usual manner — K HANDKE *Apoth Ztg*, 50 (1935), 335 (H M B)

Crystal Precipitation by Salting Out II The items discussed are α naphthol β naphthol, resorcin, hydroquinone, pyrogallol, veronal, veronal-sodium, luminal, luminal sodium, chloramine, 1,2 5-toluyldiamine hydrochloride, *p* phenylenediamine, *p*-aminodiphenylamine, 1,2 5 diaminoanisole — L ROSENTHALER *Mikrochemie*, 18 (1935), 50 (L L M)

Diaminoacridine—Determination of, in Euflavine The difference in basicity between diaminoacridine and diaminomethylacridine is used as the basis of the electrometric and colorimetric determinations of the former in the mixture **Electrometric Method**—The euflavine (containing diaminoacridine and diaminomethylacridine) is dissolved in 10 cc of warm water with shaking About 0.5–1.0 Gm of the euflavine may be used The solution is cooled and 0.5 N sodium hydroxide is added The diaminoacridine then precipitates, apparently in crystalline form or as a reddish brown oily liquid which later becomes crystalline Three of the preparations used could be titrated electrometrically after 15 minutes, having been stirred rapidly during this time Glass electrodes were used in an arrangement described by G Kilde (*Dansk Tidss Farm*, 9 (1935), 129) The method is accurate to about 1% **Colorimetric Method**—0.5 to 0.7 Gm of euflavine is dissolved in 10 cc of boiling water in a 250 cc flask with careful shaking of the flask (so that the solution is not cooled too quickly), 90 cc of isopropyl alcohol and 2 cc of thymol blue solution are added and the solution titrated with 0.1 N sodium hydroxide to a definite color change, i.e., a murky brownish color On account of the greenish fluorescence of euflavine solutions, the titrations must be made in strong electric light The solution is then titrated back with 0.1 N hydrochloric acid 0.1 cc being added at a time until the color no longer changes About 0.2 to 0.5 cc of hydrochloric acid is usually sufficient If precipitation occurs on the addition of isopropyl alcohol, add 5 to 10 cc of water and dissolve the precipitate by heating on a water-bath, and after the solution has cooled add a little isopropyl alcohol since too high a concentration of water interferes with the end point — F REIMERS *Quart J Pharm Pharmacol*, 8 (1935), 218–230 (S W G)

2,4-Dinitrophenol—Detection and Determination of Qualitative and quantitative tests were described The sample is treated with water and 4% sodium hydroxide, filtered, the filtrate acidified with hydrochloric acid and extracted with chloroform The chloroform is evaporated, 2 cc of 10% sulphuric acid and 0.2 Gm of powdered zinc are added to a portion of chloroform residue After standing 10 minutes a pink color should appear The solution is then filtered, 10 drops of 1% sodium nitrite added to the filtrate and the mixture allowed to stand in the dark for 5 minutes Two cc of saturated beta naphthol in strong ammonia is added and after 2 minutes the mixture is extracted with ether A pink or violet color in the ether layer should appear **Comparisons of crystals and melting points** with authentic samples of 2,4-dinitrophenol are recommended For quantitative determination the sample is macerated with 2% sodium hydroxide, acidified with hydrochloric acid and extracted with chloroform The chloroform extracts are then extracted with 4% sodium hydroxide until the yellow color is removed The alkaline solution is

made up to volume and an aliquot containing about 0.1 Gm. of dinitrophenol is made neutral with hydrochloric acid. Twenty cc. of 0.1N bromine and 5 cc. of concentrated hydrochloric acid are added to the solution in a glass stoppered bottle, the mixture shaken for 1 minute, cooled and 10 cc. of 15% potassium iodide added. After shaking, 1 cc. of chloroform is added and the mixture titrated with 0.1N sodium thiosulphate using starch indicator. Each cc. of 0.1N bromine corresponds to 0.0092 Gm. of dinitrophenol—I. S. SHUPP *J. Assoc. Official Agr. Chem.*, 18 (1935), 464 (G. S. W.)

Electric Micromuffle—A Pregl micromuffle was modified by replacing the wire gauze on the horizontal tube with an electric heater made by winding No. 18 Nichrome wire around a porcelain form. The advantages claimed are: An even heat is given over the whole surface so there is no spattering, no attention is required after turning on the current until the boat is removed, the heater may be slid off the tube and allowed to cool while the weighing is made—C. J. RODDEN *Mikrochemie*, 18 (1935), 97 (L. L. M.)

Enteric Coatings—I. Laboratory Method for the Study and Control of. A study made several years ago has been continued. The pH of gastric and intestinal juices has been determined, normal range being pH 1.6 to pH 1.8, though usually showing much greater range. There is evidence that in human small intestines reactions may vary from distinctly acid to slightly alkaline. Temperature of the gastrointestinal tract has been measured with a recording thermometer. Gastric temperatures have been found between 97.5° and 102.2° F., the upper part of the intestine between 98° and 100.1° F. Ingestion of hot or cold drinks makes quick change of temperature. Motility or emptying rate of stomach has been studied. Normally, peristaltic activity begins soon after ingestion of a meal but its advent may be retarded or inhibited. Experimental work was carried out in an apparatus in which tablets rotate in buffers covering gastric and intestinal range. Though a mechanical test cannot duplicate conditions in stomachs, the procedure is valuable in a laboratory study. Hundreds of tablets have been studied. Coating surface of tablets immersed in buffers from pH 1.2 to pH 6.4, showed little change after eight hours, those immersed in buffers beginning at pH 6.4 showed signs of attack and shriveling effect within five to fifteen minutes. In addition to requisite physical and chemical properties, and physiological inertness, a coating must resist a wide and variable acid range of the stomach and disintegrate at the acid reaction found in the small intestine. If a coating becomes decidedly alkaline before disintegration begins the tablet will probably pass through the small intestine without disintegrating—MILTON WRUBLE *J. Am. Pharm. Assoc.*, 24 (1935), 570 (Z. M. C.)

Essential Oils and Their Ethanol Solutions—Presence of Methanol and Formaldehyde in. A study of the methods which purport to or actually do permit of identifying or determining traces of methanol or formaldehyde in essential oils or in their solutions in ethanol, led to the conclusion that methods based on oxidation of methanol should be rejected. Ethanol that is absolutely free from methanol, and a large number of constituents of essential oils, when oxidized under analytical conditions, give rise to the formation of formaldehyde, the usual color reactions of formaldehyde, and especially the Schiff reaction, are not specific. Traces of methanol and formaldehyde are normal constituents of numerous essential oils, they exist from the time of distillation and the auto-oxidation which is more or less inevitable contributes to increase the methanol and formaldehyde contents. Commercial alcohols nearly always contain traces of methanol, and auto-oxidation of ethanol can give formaldehyde and possibly also methanol. Ethanol solutions of essential oils containing methyl esters undergo ethanolysis even at ordinary temperature, with liberation of methanol. Presence of traces of methanol or formaldehyde in essential oils or in their ethanol solutions cannot therefore be taken as proof of adulteration—Y. R. NAVES *Parfums France*, 13 (1935), 60-73, 91-104 (in French and English) (A. P. C.)

Essential Oils—Determination of Ethyl and Methyl Alcohols in Natural. The authors find that ethyl alcohol is present in rose blossoms from the moment of plucking, in quite remarkable proportions. They show that the Thorpe method, which is customarily used for the determination of alcohol in essential oils, gives results which are clearly deficient. They describe and give results obtained by the Thorpe method and also the Zeisel method which they suggest as possessing great advantages of sensitiveness, accuracy, speed and simplicity. In conclusion the authors state that the results given by Thorpe's method are definitely below the true quantity of alcohol present in a synthetic oil. The same is true with regard to the free alcohol present in a natural essential oil. Thorpe's method requires 12 cc. of oil, that of Zeisel does not need so much

as 1 Gm Zeisel's method is simpler and much more rapid, and is less susceptible to error than that of Thorpe—R GARNIER and I PALFRAY *Perf Ess Oil Rec*, 26 (1935), 259

(A C DeD)

Extract and Fluidextract of Coca, B P C—Assay of It is suggested that the B P C 1934 assay process given under 'Ext Cocae Liq' be modified to include the following (1) That the extraction of the alkaloids from ammoniacal solution be made by successive portions of ether until complete (2) That sufficient portion of dilute acid be used to completely extract the alkaloids (3) That the final ethereal solution be washed with a little water in order to remove any traces of ammonium salts (4) That the final residue be dehydrated with absolute alcohol (5) That volatile bases be excluded by heating the alkaloidal residue at 80° C for two hours—W A N MARKWELL *Pharm J*, 134 (1935), 416

(W B B)

Extracts—Determination of the Viscosity of Viscous The pharmacopœial descriptions of the consistency of thick extracts are held to need revision Relative or absolute values for limits of viscosity should be set A simple, inexpensive viscosimeter is described consisting of a disk which sinks through the fluid placed in a glass cylinder, the disk bearing an index shaft which slides in a millimeter-graduated, glass tube The sinking speed is determined with the stop-watch The ordinary viscosimeters are described and discussed, both the nozzle flow types such as the Ostwald pipette and the Engler the Redwood, the Saybolt and the Barbey instruments and the torsion types such as Couette's, Searle's and Hoeppler's The use of the sinking-disk viscosimeter is suggested for such extracts as *Ext absinthii, belladonnae, chamomilla filicis, gentianae, glycyrrhizae, hyoscyami, millefolii, secalis cornuti* Figures are reported for various specimens of *Ext glycyrrhizae, gentianae* and *menyanth* For extracts made by the same general methods from the same drug a relationship of viscosity to content of dry residue can be seen and a typical curve is given The influence of temperature on the sinking speed is also shown in a typical curve Here the viscosity coefficient is about three times greater at 15° C than at 20° C hence control of the temperature during viscosimetry is of good importance—S KJELL MARK *Farm Revy*, 34 (1935), 397, 413, 425

(C S L)

Fats and Oils—Hydroxyl Number and Acetyl Value of A report of a collaborative study of three methods was made Values obtained by the André-Cook and the Roberts-Schuette methods were in good agreement Low values were reported for the West Hoaglund Curtis method likely due to a fading of the end-point in titration—W L ROBERTS *J Assoc Official Agr Chem*, 18 (1935), 435

(G S W)

Ferrous Iron—Determination of, in Presence of Organic Matter by Heisig's Method Attention is drawn to the suitability of the iodate method (Heisig's Method) for the assay of the saccharated iron compounds of the B P and B P C and of ferrous lactate It is shown that ferrous iron may be titrated with accuracy by iodate in the presence of liquid glucose, acacia traga canth, sucrose invert sugar in small amounts, levulose, dextrose, lactose, glycerin, lactic acid and citric acid Invert sugar in great excess produces a small error The method is unsatisfactory in the presence of licorice, marshmallow, quinine and aqueous extract of cochineal—G J W FERREY *Pharm J*, 134 (1935) 784

(W B B)

Glyceryl Trinitrate Tablets—Assay of Anderson's method for the assay of glyceryl trinitrate tablets is based on the volatility of glyceryl trinitrate in steam, hydrolysis with sodium hydroxide solution, reduction of the nitrate formed and distillation of the ammonia produced into standard acid The author suggests a method which is a modification of Anderson's method The suggested modification is as follows Place five tablets in a 500 cc Kjeldahl flask, add 25 cc saturated sodium sulphate solution, 75 cc water and sufficient sulphuric acid to make just acid to litmus paper (usually 0.3 cc of N/1 sulphuric acid required) Distil just to dryness, using a still head, into a flask containing 10 cc of N/10 sodium hydroxide, keeping the outlet tube below the surface of the alkali Wash down the condenser and outlet tube and evaporate the sodium hydroxide solution to dryness Add 2 cc of water, 0.3 Gm (± 0.01 Gm) of reduced iron and 2 cc of 50% v/v sulphuric acid, allow to stand for ten minutes and boil for two minutes Transfer the acid solution to a steam distillation apparatus, make alkaline with 4 cc of saturated hydroxide solution and distil the liberated ammonia into a flask containing 10 cc of N/10 sulphuric acid until the distillate measures 500 cc Take 100 cc of the distillate, add 2 cc of Nessler's reagent and compare the color produced with that produced by adding the same amounts of reagent to 100 cc of a solution containing ammonium chloride equivalent to 0.1 mg of nitrogen The color of

the unknown should not vary more than 20% from that of the standard, and a control experiment must always be carried out, the 500 cc distillate being concentrated to 100 cc. From the difference between the nitrogen content of the experimental solution and the control, the glyceryl trinitrate present can be calculated. Factor, nitrogen to glyceryl trinitrate 5.4.—W. SMITH *Pharm J*, 134 (1935), 790 (W. B. B.)

Glyceryl Trinitrate Tablets—Assay of The method adopted by the author for the assay of glyceryl trinitrate tablets is as follows. For tablets of B. P. strength, weigh accurately the equivalent of 1 mg. of glyceryl trinitrate, in the form of powdered tablets, into a stoppered cylinder containing exactly 5 cc. of glacial acetic acid. Shake continuously for one hour, filter and transfer 1 cc. to a small porcelain dish. To this promptly add about 2 cc. of phenoldisulphonic acid, stir well and allow to stand for fifteen minutes. Dilute with about 8 cc. of water, make alkaline cautiously with ammonia and transfer to a 25 cc. stoppered vessel. When cool adjust the volume to 20 cc. and the temperature to 20° C. and filter. Compare the color in suitable glass containers with that produced as follows: (1) Dilute 1 cc. of solution of glyceryl trinitrate of exactly 1% strength with 50 cc. of glacial acetic acid, mix thoroughly, transfer 1 cc. to a porcelain dish, add phenoldisulphonic acid and proceed as above. (2) Transfer 1 cc. of a 0.225% aqueous solution of silver nitrate B. P. to a porcelain dish, evaporate gently to dryness, add phenoldisulphonic acid and proceed as above. The color produced in all three cases should be equal to 7.0 Lovibond yellow units when viewed through a glass cell of 1 inch internal width.—H. O. MEEK *Pharm J*, 134 (1935), 791 (W. B. B.)

Gold—Microchemical Determination of, in the Presence of Palladium and Tin Large amounts of palladium and tin do not interfere with the determination of gold by a method previously reported by the author (*Mikrochemie* 13 (1933) 165 and 17 (1935), 174).—J. DONAU *Mikrochemie*, 18 (1935), 11 (L. L. M.)

Gold Sol—Preparation of, for Liquid Analysis The stock solution contains gold bromide crystals, 5.0 Gm., purified potassium bromate, 1.365 Gm., and freshly distilled water, 38.7 Gm. This solution is stable for one year. For preparation of the gold sol 1 cc. of the stock solution is first diluted with 14 cc. of distilled water and then further diluted with water to make one liter. For the reduction, 10 cc. of a 1% potassium oxalate solution is added, and the solution placed in daylight for about 20 minutes.—W. HERMANN *Ztschr. Immunitätsforsch.*, 84 (1935), 279, through *Pharm. Zentralh.*, 76 (1935), 394 (E. V. S.)

Heroin—Micro-Detection of Among the various alkaloidal reagents the following give the most characteristic crystalline precipitates with heroin: (1) A saturated solution of mercuric diiodide in 10% hydrochloric acid, (2) gold chloride in concentrated hydrochloric acid and sodium picrate.—WILLIAMS and FULTON *Freie Apoth. Stimmen*, 17-18 (1934), 19, through *Pharm. Tijdschr. Nederland-Indië*, 13 (1935), 56 (E. H. W.)

Indigocarmine—Use of, in Microvolumetric Analysis One gram equivalent of indigocarmine corresponds to one half gram mole $\frac{C_{16}H_{15}N O_5 S \cdot Na_2}{2} = 233.11$ Gm. The reagent is best suited for volumetric analysis in 0.001N solution. It is standardized for use in alkaline solution against 0.01N potassium ferricyanide in the presence of sodium carbonate, for use in acid solution, against potassium permanganate in the presence of sulphuric acid. 1 cc. of 0.001N indigocarmine solution corresponds to 0.3292 mg. potassium ferricyanide. 1 cc. of 0.001N potassium permanganate solution corresponds to 0.23311 mg. indigocarmine or to 0.21111 mg. indigodisulphonic acid. Small amounts of ferrous iron may be determined with fair accuracy by oxidizing the iron with excess standard potassium permanganate, then titrating the excess permanganate with indigocarmine solution.—I. M. KORENMAN *Mikrochemie* 18 (1935), 31 (L. L. M.)

Indophenol Reaction—Application of the, for the Identification of Some Organic Polyacids A drop of the neutralized acid is evaporated to dryness, mixed with a trace of phosphorous trisulphide and heated with a few drops of a solution of isatin in sulphuric acid. A blue color is developed. The reaction is most sensitive with succinic and fumaric acid but is produced also with maleic, malic, pyrotartaric, tartaric and citric acid.—JOSÉ VÁZQUEZ SÁNCHEZ *Farm. Moderna*, 46 (1935), 58 (A. E. M.)

Iron—Cermetric Titration of Small Amounts of, by Means of α, α' -Dipyridyl as Indicator Dilute acid solutions of ferrous compounds give a sharp end-point (pink colorless) when titrated with ceric sulphate. The indicator solution consists of 0.25 Gm. α, α' -dipyridyl dissolved in 50 cc.

water with 50 cc of concentrated ammonia water added afterward. About 5 drops of this solution is used for 50 cc of ferrous solution. The ammonia is added to speed the formation of the colored indicator complex which develops slowly in acid solution. With this indicator, ferrous solutions containing 0.1–10 mg iron in 50 cc 1*N* hydrochloric acid may be titrated by means of 0.002–0.015*N* ceric sulphate in 1*N* sulphuric acid solution. The end point appears within one drop and is far better than with a titanous solution. Ceric sulphate solution is quite stable when guarded against direct sunlight, even in extreme dilutions. For the reduction of ferric iron, the silver reductor of Walden, Hammett and Edmonds was found to present an improvement over the Jones reductor, *et al*, provided the acid concentration is kept within 0.5–1*N* hydrochloric acid.—C. J. VAN NIEUWENBURG and H. B. BLUMENDAL. *Mikrochemie*, 18 (1935), 39.

(L. L. M.)

Lactic Acid—Determination of The author refers to the reports of Girault, who claims that the official method gives too high results, and of Bourdeau, who reports satisfactory results with the same method. The author's results indicate that the official method is a good one, but certain lactic acids yield results higher than 100% owing to the presence of esters which are hydrolyzed.—F. KAYSER. *J. pharm. chim.*, 21 (1935), 604.

(M. M. Z.)

Medicinal Mixtures—Thermo-Analysis and Eutectics of The author discusses the thermo analysis and eutectic temperatures of mixtures of several organic medicinal chemicals. Cases where a molecular combination results between the two chemicals in the mixture are discussed along with cases where no reaction occurs. Combinations of antipyrine, veramon, combral, hypnal and trigemine are fully discussed as is also the caffeine salicylic acid mixture (the sodium salicylate caffeine mixture). The following eutectic temperatures of such combinations are given:

Combination	Eutectic Temp	Composition
Bromural-pyramidon	78.0°	41 % bromural
Pyramidon acetanilid	58.5°	41 % acetanilid
Pyramidon phenacetin	78.5°	68 % pyramidon
Acetanilid phenacetin	82.5°	58 % acetanilid
Salol-benzonaphthol	34.0°	86.9 % salol
Bromural-salol	40.8°	3.5 % bromural
Bromural-phenacetin	109.0°	53 % bromural
Veronal salol	41.2°	1.5 % veronal
Veronal-phenacetin	121.6°	26.2 % veronal

The liquification of powder mixtures is discussed and tables giving eutectic temperatures and compositions of mixtures of camphor with salol, naphthaline, β -naphthol, resorcin and ethylurethan, of salol with monobromcamphor, β -naphthol, thymol, guaiacol, naphthaline antipyrine, urethan, menthol, chloral hydrate, methylacetanilid sulfonal, phenacetin and terpin hydrate, of phenol with β -naphthol, naphthaline and acetanilid, and several others are quoted from the literature.—J. MEIJER. *Pharm. Weekblad*, 72 (1935), 922.

(E. H. W.)

Mercurochrome—Determination of Mercury Content of Assuming that the B. P. C. method of assay for the mercury content of mercurochrome is accurate, and adopting the limits laid down in the particular monograph, not one manufacturer's sample examined conformed to the required standard. The results obtained by the B. P. C. method of assay show an appreciable experimental variation. The alkaline-permanganate oxidation method for the assay of mercury appears to give more reliable and consistent results than the B. P. C. method.—R. F. CORRAN and F. E. RYMLL. *Pharm. J.*, 134 (1935), 783.

(W. B. B.)

Methanol—New Method for the Determination of Small Quantities of, in Presence of Very Large Quantities of Ethanol and Its Homologues The method, which is long and delicate is essentially an accurate research method. It is based on the 4 following steps: (1) converting the primary alcohols into the corresponding iodides, (2) distillation of the alkyl halides, (3) treatment of the distillate with silver acetate to regenerate the alcohols with formation of silver iodide, which is weighed (giving the "iodization value," *P*) and finally (4) oxidizing the alcohols in the cold and determining the oxygen consumed (giving the "oxidation value," *p*). If *X* and *Y* are respectively, the amounts of methanol and ethanol to be determined, $P = 234.8 (X/32 + Y/46)$ and $p = 48X/32 + 32Y/46$, whence $X = 2 \times 32 (p/32 - P/234.8)$ and $Y = 3 \times 36 (P/234.8 -$

p/48) The method, which is described in detail, is essentially as follows. The methanol is concentrated by a suitable rectification collecting the head fraction containing all the methanol together with impurities such as acids, aldehydes, etc., the latter are removed by adding a slight excess of silver nitrate, letting stand over night, neutralizing with 10% potassium carbonate and redistilling, further rectifications are carried out if necessary, iodization is carried out at about 105° C with 3 cc of hydriodic acid (specific gravity 1.7) and 0.5 cc of sample, the vapors being washed by passing through a suspension of 10 mg calcium carbonate in 5 cc of water at 45° to 50° C and collected under a solution of 0.5 Gm silver acetate in 50 cc of water, and a current of pure carbon dioxide being passed through the apparatus, iodization requires about one hour and a quarter from the time the distillate begins to collect in the silver acetate solution, not less than 2 hours after iodization is complete the solution in the receiver is redistilled, the distillate collected under 5 cc of water and made to 50 cc, and *p* is determined in the distillate and *P* in the residue. To determine *p*, add 5 cc of distillate to 10 cc of solution containing 5 cc of 66° Be sulphuric acid and 20 mg of potassium dichromate in a 25-cc glass-stoppered Erlenmeyer, stopper, let stand over night and titrate the excess of dichromate iodometrically, under these conditions methanol is oxidized according to equation $2\text{CH}_3\text{OH} + 3\text{O}_2 = 2\text{CO}_2 + 4\text{H}_2\text{O}$, and ethanol and higher homologues according to $2\text{RCH}_2\text{OH} + 2\text{O}_2 = 2\text{RCO}_2\text{H} + 2\text{H}_2\text{O}$. To determine *P* add 1 cc of nitric acid (specific gravity 1.38) and 50 cc of water to the residue containing silver bromide, boil gently with successive additions of water to compensate for evaporation till the precipitate is a bright canary yellow, filter, wash dry 1 hour at 130° to 150° C and weigh. The limit of sensitiveness is about 0.05 mg methanol in the 0.5 cc taken for iodization, and the accuracy varies from about 0.5% for a methanol ethanol ratio of 1:100 to about 5 to 10% for a ratio of 1:1000 to 1:2,000, this, however, requires the use of very pure reagents, and commercial hydriodic acid should be purified by treatment with red phosphorus and redistillation. The various steps of the method are discussed in detail to justify the technique adopted. Application of the method to a large number of wines, brandies and fermented fruit juices showed that methanol in amounts up to over 4,000 mg per liter is a normal constituent of all natural alcoholic media.—M FLANZY *Ann Fals*, 28 (1935), 260-277, cf *J Am Pharm Assoc*, *Abstract Sect*, 29 (1935), 125 (A P-C)

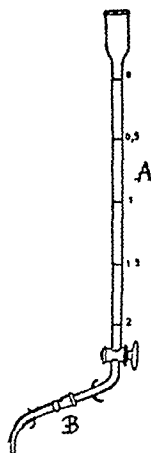
Methyl Alcohol—Determination of, in Alcoholic Products A method for the determination of methyl alcohol in the presence of ethyl alcohol was described. The method depends upon the formation of the iodides, their partial separation by fractionation, their conversion into salts by trimethylamine and the separation of the tetramethylammonium iodide formed from the methyl alcohol from absolute alcohol. The apparatus used is a modification of the Zeisel Fanto apparatus for the determination of methoxy groups. Red phosphorus and iodine are used rather than the more expensive hydriodic acid. Most of the interfering substances may be removed by use of a distillate of the sample.—J B WILSON *J Assoc Official Agr Chem*, 18 (1935), 477 (G S W)

Microburette—New, with Removable Tip The burette designed by Khouri and manufactured by Etablissements Prolabo, 12, rue Pelée, Paris is made in two sections. The advantages claimed are easy filling and cleaning and different tips giving the size of drops desired.—*J pharm chim*, 21 (1935) 607 (S W G)

Microchemical Laboratory Technique—Improvements in The items discussed are (a) some devices for working with the filter-stick of Emich, *te*, frame, forceps and wash bottle, (b) sharpening block for glass knives, (c) an improvement in the determination of residues in the micromuffle.—H K ALBER *Mikrochemie*, 18 (1935), 92 (L L M)

Microdistillation—Apparatus for The apparatus was designed for use with vacuum 0.05 cc of liquid may be distilled. No special technique is required for operation and the unit need not be constructed for each distillation. Specifications and illustrations are given.—L V PEAKES, JR *Mikrochemie*, 18 (1935) 100 (L L M)

Microiodometric Determinations The investigation showed that the microiodometric determination of sulphites and tin salts by iodine may be replaced by the use of iodate. The following advantages are claimed. In the preparation of the volumetric solution no special pre-



caution need be taken to prevent loss of material through volatilization Volumetric solutions of potassium iodate do not require restandardization as frequently as do diluted solutions of iodine

Determination of Sulphite—To 2–5 cc of the diluted sulphite solution are added about 0.5 cc of sulphuric acid (1.5) and several drops of starch solution To the mixture is added 0.01N potassium iodate solution to the appearance of a weak permanent color

Determination of Stannous Chloride—To 2–5 cc of the stannous chloride solution acidified with hydrochloric or sulphuric acid, is added the starch solution and then 0.01N potassium iodate solution to the appearance of a weak blue color $2\text{KIO}_3 = 6\text{SnCl}_2$ —I. M. KORENMAN *Mikrochemie*, 17 (1935), 361

(L. L. M.)

Micropolarographic Investigations A description with illustrations is given of an apparatus by the use of which the polarographic electrolysis of quantities of solution as low as 0.005 cc is made possible The use of the apparatus and of micropipettes is discussed—V. MAJER *Mikrochemie*, 18 (1935), 74

(L. L. M.)

Microshaker Useful in Microtitrations The apparatus is made from an electromagnetic loud-speaker—K. SCHWARZ *Mikrochemie*, 18 (1935), 106

(L. L. M.)

Microsublimation—Is It Useful in the Investigation of Powdered Drug Mixtures? The method employed was that of Tunmann Since little could be found in the literature, 19 drugs were first investigated individually as to sublimation products Of them, 13 were found to give characteristic results Using these drugs mixtures first of only two drugs were investigated, then mixtures of three or more components The results were tabulated Of 92 drug mixtures investigated 61 could be fully identified by microsublimation, in 25 mixtures not all of the drugs could be identified and in only 6 mixtures could none be identified—F. WIESMANN *Pharm. Acta Helv.* 10 (1935), 125

(M. F. W. D.)

Mineral Oils—Contribution to the Study of Official A comprehensive study and survey of the physical and chemical properties of mineral oils obtained from French, Belgian, German and American refineries The result of this study is a proposal of a monograph on mineral oils for the French Codex now in preparation—F. GRÉGOIRE *Bull. sci. pharmacol.* 42 (1935), 152, 217

(C. T. I.)

Mineral Pigments—Systematic Method for the Identification of II. Blue and Green Pigments The blue pigments were differentiated (1) By their behavior toward sodium hydroxide in the warm Prussian blue gives a red brown precipitate, other pigments remain unaffected (2) With warmed diluted hydrochloric acid, ultramarine liberates hydrogen sulphide, mineral blue (blue basic carbonate of copper) carbon dioxide, Bremen blue dissolves without evolution of gas, cobalt blue and smalt blue remain unchanged In the last two cases cobalt may be detected Cobalt blue is insoluble in boiling hydrochloric acid (1:1), whereas smalt blue is partly soluble leaving a residue of silicic acid The green pigments are warmed with diluted hydrochloric acid Mineral green dissolves with evolution of carbon dioxide, Paris green evolves vapors of acetic acid Bremen green Scheele's green and cobalt green dissolve completely without evolution of gas The last three pigments are differentiated by tests for copper for copper and arsenic and for cobalt respectively Partial solubility in diluted hydrochloric acid suggests further test for glauconite or for mixed chromium pigments Finally, if the pigment is practically insoluble in diluted hydrochloric acid it is dissolved in concentrated hydrochloric acid and tested for chromium (chromium green) In all cases special microchemical reactions are given for the elements mentioned—S. AUGUSTI *Mikrochemie*, 17 (1935), 344

(L. L. M.)

Morphine—Colorimetric Assay of The method is based upon the blue color formed by morphine on reduction with silicomolybdic acid The method consists of dissolving 0.2–0.10 mg of morphine or an equivalent amount in liquid form in 5 cc of 1% hydrochloric acid, then 2 cc of silicomolybdic acid 5 cc of ammonia water (5%) and water to make 25 cc added in order given After standing for five minutes it is standardized against the standard prepared by using 5 cc of a 1:1000 solution of morphine in 1% hydrochloric acid in the given test The silicomolybdic acid is prepared according to a previous article (*Biochem. Ztschr.*, 27 (1933), 260)—R. HOFMANN and N. POPOVICI *Pharm. Zentralh.*, 76 (1935), 346

(E. V. S.)

Morphine—Determination of, in Tincture and Extract of Opium. Mannich's method (*Arch. Pharm.* 273 (1935), 112) is modified **Tincture of Opium**—Evaporate 30 Gm of the tincture in a porcelain dish on a water-bath to 10 Gm triturate with 1.5 Gm calcium hydroxide and add water to 31.5 Gm After standing for 1/2 hour with frequent stirring, filter through a plated

filter (10 cm) To 20 Gm of the filtrate (= 20 Gm of tincture) in a 100-cc Erlenmeyer flask, add 5 Gm water, 38 Gm methyl alcohol and 7 Gm alkaline potassium ovalate solution (18.4 Gm neutral potassium ovalate, 10 Gm 0.1N potassium hydroxide, water $q\ s$ 100.0 Gm) and warm on a water-bath to 50° C After cooling filter through a plated filter (8 cm), keep covered triturate 56 Gm of the filtrate (= 16 Gm of tincture) with a solution of dinitrochlorobenzene (0.6 Gm in 10 Gm) (= 12.5 cc) and then add 10 Gm water Collect the crystals which separate over night in a Gooch crucible, wash with 6 cc methyl alcohol and 4 cc ether in small portions and weigh after drying at 100° C

$$\frac{100 (\text{morphine ether} + 0.005) \times 0.632}{16} = \% \text{ morphine}$$

(Factor 0.632 is obtained by $\frac{285.2}{451.19}$ (morphine) *Extract of Opium*—Triturate 1.5 Gm of the extract with 1.5 Gm potassium hydroxide and 10 Gm water and add water to 31.5 Gm Proceed as under the assay of the tincture in which a 56 Gm aliquot is equal to 0.8 Gm of the extract

$$\frac{100 (\text{morphine ether} + 0.005) \cdot 0.632}{0.8} = \% \text{ morphine}$$

Results obtained are compared with

those by the German Pharm VI method and volumetric method—K. HANDKE *Apoth Ztg*, 50 (1935), 5101 (H. M. B.)

Morphine—Micromethod of Determination of, in Opium Preparations Mix 0.05 Gm of dried and ground opium with 0.02 Gm calcium hydroxide and add gradually 10 cc of water Mix thoroughly for 30 minutes leave standing for 15 minutes and filter through a dried filter Take 5 cc and evaporate to dryness Add 0.2 cc of an ammonium chloride solution (10%) and 3 cc of purified ether Decant the ether after 24 hours through a small filter and wash two times with 3 cc ether Finally wash the filter with 10 cc ether Dry residue and filter at moderate heat and dissolve in hot methyl alcohol, washing it through the filter, using 3, 3.2 and 2 cc Add to the filtrate one cc of 0.1N phosphoric acid and bring with water to a volume of 50 cc Ten cc are mixed with 10 cc of a saturated sodium carbonate solution and 2 cc of a solution of sodium phosphotungstic molybdate (Folin and Denis) The blue color is compared colorimetrically with a standard morphine solution containing 0.1 mg base per cc The method can be applied to opium extract tincture and morphine solutions—LUIS DE PRADO *Anales de Farm Bioquim*, 6 (1935), 12 (A. E. M.)

Nicotine—Nephelometric Determination of Small Quantities of Advantages of the nephelometric method over the author's colorimetric method are (1) smaller quantities may be used for the determination without decreasing the accuracy, (2) less time is required, (3) economy of materials, which is of particular importance in forensic investigations *Method*—Tobacco was steam distilled as described in *Bül Cultivărei și Fermentărei Tutunului* 42 (1932) One hundred cc of distillate were collected, of which 25 cc were reserved for gravimetric analysis In each of 5 test-tubes was placed 5 cc of 0.5% hydrochloric acid The contents of the first tube were mixed with 5 cc of distillate, and 5 cc of the diluted distillate were transferred to the second tube Continuing in this manner, five different dilutions were prepared which differed from each other in nicotine concentration by 50% To each tube was added 1 cc of silicomolybdate reagent and the resulting turbidity was compared with that produced by a 0.0015% nicotine solution That dilution was then chosen which produced a turbidity greater than that of the standard nicotine solution An additional 100 cc of this dilution were prepared by neutralizing the required volume of distillate with 0.1N hydrochloric acid using methyl red as indicator Ten cc of 5% hydrochloric acid were added and the whole diluted to 100 cc with water From this solution different dilutions of 10 cc each were prepared with 0.5% hydrochloric acid, each dilution was mixed with 2 cc of reagent and the mixtures were compared nephelometrically

$$\% \text{ nicotine} = \frac{100,000 V f F}{V_1 V_2 E}$$

where V = cc of distillate, f = observed nephelometer reading (standard compared with test sample), V_1 = cc of diluted distillate prepared, V_2 = cc of diluted distillate used in the determination, F = titer of the standard solution in Gm, E = weight of standard—R. HOFMANN *Mikrochemie* 18 (1935) 24 (L. L. M.)

caution need be taken to prevent loss of material through volatilization Volumetric solutions of potassium iodate do not require restandardization as frequently as do diluted solutions of iodine

Determination of Sulphite—To 2-5 cc of the diluted sulphite solution are added about 0.5 cc of sulphuric acid (1.5) and several drops of starch solution To the mixture is added 0.01N potassium iodate solution to the appearance of a weak permanent color

Determination of Stannous Chloride—To 2-5 cc of the stannous chloride solution acidified with hydrochloric or sulphuric acid, is added the starch solution and then 0.01N potassium iodate solution to the appearance of a weak blue color $2\text{KIO}_3 = 6\text{SnCl}_2$ —I. M. KORENMAN *Mikrochemie*, 17 (1935), 361

(L. L. M.)

Micropolarographic Investigations A description with illustrations is given of an apparatus by the use of which the polarographic electrolysis of quantities of solution as low as 0.005 cc is made possible The use of the apparatus and of micropipettes is discussed—V. MAJER *Mikrochemie*, 18 (1935), 74

(L. L. M.)

Microshaker Useful in Microtitrations The apparatus is made from an electromagnetic loud speaker—K. SCHWARZ *Mikrochemie* 18 (1935), 106

(L. L. M.)

Microsublimation—Is It Useful in the Investigation of Powdered Drug Mixtures? The method employed was that of Tunmann Since little could be found in the literature, 19 drugs were first investigated individually as to sublimation products Of them 13 were found to give characteristic results Using these drugs mixtures first of only two drugs were investigated, then mixtures of three or more components The results were tabulated Of 92 drug mixtures investigated, 61 could be fully identified by microsublimation, in 25 mixtures not all of the drugs could be identified and in only 6 mixtures could none be identified—F. WIESMANN *Pharm. Acta Helv.*, 10 (1935), 125

(M. F. W. D.)

Mineral Oils—Contribution to the Study of Official A comprehensive study and survey of the physical and chemical properties of mineral oils obtained from French, Belgian, German and American refineries The result of this study is a proposal of a monograph on mineral oils for the French Codex now in preparation—F. GRÉGOIRE *Bull. sci. pharmacol.*, 42 (1935), 152, 217

(C. T. I.)

Mineral Pigments—Systematic Method for the Identification of II. Blue and Green Pigments The blue pigments were differentiated (1) By their behavior toward sodium hydride in the warm Prussian blue gives a red brown precipitate, other pigments remain unaffected (2) With warmed diluted hydrochloric acid, ultramarine liberates hydrogen sulphide, mineral blue (blue basic carbonate of copper) carbon dioxide, Bremen blue dissolves without evolution of gas, cobalt blue and smalt blue remain unchanged In the last two cases cobalt may be detected Cobalt blue is insoluble in boiling hydrochloric acid (1.1), whereas smalt blue is partly soluble leaving a residue of silicic acid The green pigments are warmed with diluted hydrochloric acid Mineral green dissolves with evolution of carbon dioxide, Paris green evolves vapors of acetic acid, Bremen green, Scheele's green and cobalt green dissolve completely without evolution of gas The last three pigments are differentiated by tests for copper for copper and arsenic and for cobalt respectively Partial solubility in diluted hydrochloric acid suggests further test for glauconite or for mixed chromium pigments Finally, if the pigment is practically insoluble in diluted hydrochloric acid it is dissolved in concentrated hydrochloric acid and tested for chromium (chromium green) In all cases special microchemical reactions are given for the elements mentioned—S. AUGUSTI *Mikrochemie* 17 (1935), 344

(L. L. M.)

Morphine—Colorimetric Assay of The method is based upon the blue color formed by morphine on reduction with silicomolybdic acid The method consists of dissolving 0.2-0.10 mg of morphine or an equivalent amount in liquid form in 5 cc of 1% hydrochloric acid then 2 cc of silicomolybdic acid 5 cc of ammonia water (5%) and water to make 25 cc added in order given After standing for five minutes it is standardized against the standard prepared by using 5 cc of a 1:1000 solution of morphine in 1% hydrochloric acid in the given test The silicomolybdic acid is prepared according to a previous article (*Biochem. Ztschr.*, 27 (1933), 260)—R. HOFMANN and N. POPOVICI *Pharm. Zentrall.*, 76 (1935), 346

(E. V. S.)

Morphine—Determination of, in Tincture and Extract of Opium Mannich's method (*Arch. Pharm.* 273 (1935), 112) is modified **Tincture of Opium**—Evaporate 30 Gm of the tincture in a porcelain dish on a water-bath to 10 Gm, triturate with 1.5 Gm calcium hydroxide and add water to 31.5 Gm After standing for 1/2 hour with frequent stirring, filter through a plated

filter (10 cm) To 20 Gm of the filtrate (= 20 Gm of tincture) in a 100-cc Erlenmeyer flask, add 5 Gm water, 38 Gm methyl alcohol and 7 Gm alkaline potassium ovalate solution (18.4 Gm neutral potassium ovalate, 10 Gm 0.1N potassium hydroxide, water $q.s.$ 100.0 Gm) and warm on a water-bath to 50° C After cooling filter through a plated filter (8 cm), keep covered, triturate 56 Gm of the filtrate (= 16 Gm of tincture) with a solution of dinitrochlorobenzene (0.6 Gm in 10 Gm) (= 12.5 cc) and then add 10 Gm water Collect the crystals which separate over night in a Gooch crucible, wash with 6 cc methyl alcohol and 4 cc ether in small portions

and weigh after drying at 100° C
$$\frac{100 (\text{morphine ether} + 0.005) \times 0.632}{16} = \% \text{ morphine}$$

(Factor 0.632 is obtained by $\frac{285.2}{451.19}$ (morphine) *Extract of Opium*—Triturate 1.5 Gm of

the extract with 1.5 Gm potassium hydroxide and 10 Gm water and add water to 31.5 Gm Proceed as under the assay of the tincture in which a 56 Gm aliquot is equal to 0.8 Gm of the extract

$$\frac{100 (\text{morphine ether} + 0.005) \cdot 0.632}{0.8} = \% \text{ morphine}$$
 Results obtained are compared with

those by the German Phar. VI method and volumetric method —K. HANDKE *Apoth. Ztg.*, 50 (1935), 5101 (H. M. B.)

Morphine—Micromethod of Determination of, in Opium Preparations Mix 0.05 Gm of dried and ground opium with 0.02 Gm calcium hydroxide and add gradually 10 cc of water Mix thoroughly for 30 minutes leave standing for 15 minutes and filter through a dried filter Take 5 cc and evaporate to dryness Add 0.2 cc of an ammonium chloride solution (10%) and 3 cc of purified ether Decant the ether after 24 hours through a small filter and wash two times with 3 cc ether Finally wash the filter with 10 cc ether Dry residue and filter at moderate heat and dissolve in hot methyl alcohol, washing it through the filter, using 3, 3.2 and 2 cc Add to the filtrate one cc of 0.1N phosphoric acid and bring with water to a volume of 50 cc Ten cc are mixed with 10 cc of a saturated sodium carbonate solution and 2 cc of a solution of sodium phosphotungstic molybdate (Folin and Denis) The blue color is compared colorimetrically with a standard morphine solution containing 0.1 mg base per cc The method can be applied to opium extract, tincture and morphine solutions —LUIZ DE PRADO *Anales de Farm. Bioquim.*, 6 (1935), 12 (A. E. M.)

Nicotine—Nephelometric Determination of Small Quantities of Advantages of the nephelometric method over the author's colorimetric method are (1) smaller quantities may be used for the determination without decreasing the accuracy, (2) less time is required, (3) economy of materials, which is of particular importance in forensic investigations *Method*—Tobacco was steam distilled as described in *Bul. Cultivării și Fermentării Tutunului*, 42 (1932) One hundred cc of distillate were collected of which 25 cc were reserved for gravimetric analysis In each of 5 test-tubes was placed 5 cc of 0.5% hydrochloric acid The contents of the first tube were mixed with 5 cc of distillate, and 5 cc of the diluted distillate were transferred to the second tube Continuing in this manner, five different dilutions were prepared which differed from each other in nicotine concentration by 50% To each tube was added 1 cc of silicomolybdate reagent and the resulting turbidity was compared with that produced by a 0.0015% nicotine solution That dilution was then chosen which produced a turbidity greater than that of the standard nicotine solution An additional 100 cc of this dilution were prepared by neutralizing the required volume of distillate with 0.1N hydrochloric acid using methyl red as indicator Ten cc of 5% hydrochloric acid were added and the whole diluted to 100 cc with water From this solution different dilutions of 10 cc each were prepared with 0.5% hydrochloric acid, each dilution was mixed with 2 cc of reagent and the mixtures were compared nephelometrically

$$\% \text{ nicotine} = \frac{100,000 V f F}{V_1 V_2 E}$$

where V = cc of distillate, f = observed nephelometer reading (standard compared with test sample), V_1 = cc of diluted distillate prepared, V_2 = cc of diluted distillate used in the determination, F = titer of the standard solution in Gm, E = weight of standard —R. HOFMANN *Mikrochemie*, 18 (1935), 24 (L. L. M.)

Nitrogen—Volumetric Determination of Residual, without Distillation In each of two or three small Wassermann tubes are placed 3 cc of sulphuric acid (0.1% by volume) 0.04–0.05 cc of blood (serum) are added from a capillary pipette, the pipette being washed by drawing acid into the tube two or three times. To each tube is added 1 cc of phosphomolybdic acid solution (5 Gm anhydrous sodium sulphate and 8.3 Gm phosphomolybdic acid in 200 cc of water plus 20 cc of about 5*N* sodium hydroxide, then boiled $\frac{1}{2}$ hour over a direct flame, after cooling, 10.6 cc of concentrated sulphuric acid are added and made up to 1,000 cc). After mixing, the tubes are placed for 5 minutes in a water-bath at 60° C, then cooled to room temperature and filtered through a 5 cm Schleicher and Schüll 595 filter. Three cc of filtrate are placed in a 10 cc incinerating flask together with 0.5 cc of sulphuric acid (25% by volume) and ashed over a microburner until acid vapors are no longer emitted and the residue remains colorless upon cooling. The cooled residue is diluted with a little absolutely ammonia free water, and 1 cc of indicator (15 mg methyl red, Kahlbaum, dissolved in 10 cc 1*N* sodium hydroxide and diluted to 1,000 cc with water). A solution of 27% purest sodium hydroxide is added dropwise from a capillary to the appearance of the indicator change. The neutral mixture is transferred quantitatively with a little wash water to a Hagedorn-Jensen flask containing 5 cc of hypobromite buffer mixture (a) 85.5 Gm boric acid 14.6 Gm sodium hydroxide dissolved in 800 cc water, the solution being boiled 30 minutes to expel ammonia, then diluted to 1,000 cc (b) 20 Gm of potassium bromide dissolved in 100 cc 1*N* sulphuric acid in a 1-l volumetric flask, afterward dissolving in the mixture 8 Gm bromine then diluting to the mark. To 4–5 cc of "b" is added dropwise sodium hydroxide until the brown color is changed to yellow then 10 cc of buffer solution "a" and finally enough water to make 100 cc. After the addition of several granules of iodate free potassium iodide and 3 cc of hydrochloric acid (fuming acid diluted with an equal volume of water), the mixture is titrated with 0.0025*N* sodium thiosulphate delivered from a Pregl semi microburet, using starch as indicator. 1 cc of 0.0025*N* thiosulphate corresponds to 11.66 mg nitrogen — F RAPPAPORT and R PISTNER *Mikrochemie* 18 (1935), 43 (L L M)

Oil of Hypericum—Examination Fifteen samples of oil are examined by means of the color comparator of Rojahn-Heinrici (*Pharm Ztg*, 78 (1933), 504) and the quartz lamp. It is observed that the oil from *Hypericum perforatum* L shows a yellow red fluorescence and the capillary streaks prepared from the oil of *Hypericum verum* fluoresces red-violet under the quartz lamp — F SONNTAG *Apoth Ztg* 50 (1934), 399–401 (H M B)

Oil of Peppermint—Determination of B proposes the following procedure. Weigh the oil, acetate and saponify as directed in the German Phar VI then add 1 cc phenolphthalein solution and 1.5–2 cc of official methylene blue solution diluted 1:10 and titrate with 0.5*N* hydrochloric acid until the color change is red violet to green — G BAUMGARTEN *Apoth Ztg*, 50 (1935) 364 (H M B)

Oil of Peppermint—Determination of Menthone in Menthone will form a ketoxime with hydroxylamine hydrochloride which reaction releases free hydrochloric acid thus 1 molecule of menthone will liberate 1 molecule of free hydrochloric acid which may be titrated (1 cc $\frac{N}{2}$ KOH is equivalent to 0.077 Gm menthone). The reagents used are a 50% solution of hydroxylamine hydrochloride in alcohol half normal alcoholic potash and methyl orange Poirier No 3 as indicator. Two–3 Gm of peppermint oil are weighed out, two drops of helianthene and 15–20 cc of the solution of hydroxylamine hydrochloride added. The liquid is colored red. Half normal alcoholic potash is then carefully added, care being taken that the solution does not become alkaline. The solution is then repeatedly shaken, after which small quantities of the hydroxylamine solution are repeatedly added until the red color disappears permanently. The solution is then carefully neutralized with the half normal alkali and the menthone content calculated from the number of cc used — GASTON PARRAUD *Bull sci pharm*, (1935) 337, through *Pharm Weekblad* 72 (1935), 878 (E H W)

Oil of Turpentine—Detection of Pine Oil in H finds that the following modification of Wolff's test (*Farbenztg*, 17, No 2) is satisfactory. Mix equal parts of a solution of 0.5 Gm calcium ferricyanide in 250 Gm water and a solution of 0.2 Gm ferric chloride in 250 Gm water and add to 8 cc of this mixture in a test-tube 5–8 drops of the oil and shake vigorously for 15 seconds. If pure pine oil is present a light blue color is noticeable in the border zone becoming quickly stronger and after 2–5 minutes strong blue color. The iron solution becomes immediately green yellow to yellow green to green to blue green and after 5 minutes blue. After 15 minutes there is a

deep dark blue turbidity in the border zone and the iron solution is deep blue and somewhat turbid, after $1\frac{1}{2}$ to 1 hour a precipitate of Berlin Blue is formed which settles to the bottom. With *Pure oil of turpentine* the border zone after shaking and after 2-3 minutes remains colorless and the lower liquid is pure yellow to yellow green (5-10 minutes) and then green (slowly), in 3-5 minutes a light blue color appears in the border zone. Old and fresh oils react alike. With pine oil additions up to 30% the test is as with pure pine oil. Additions of 10-20% may be easily recognized especially by comparison of the iron solutions, since with pure oil this solution becomes yellow green in 10 minutes and is, by only a small addition of pine oil, soon colored blue-green or blue, with 10% pine oil a green color and after 5 minutes a blue green color. The pure oils in the course of an hour or more never give more than a green color to the iron solution. Oils containing pine oil color the iron solution in this time deep blue and also become turbid. Two tables are given: (1) six oils from various sources are compared as to the color produced with potassium hydroxide and (2) the appearance of the border zone and ferric chloride solution after 1, 2, 3 and 5 minutes and 10-15 minutes with shaking with six samples of oils using the Berlin Blue test just described.—K. HÖLL *Apoth Ztg*, 50 (1935), 748-750 (H M B)

Opium, Concentrated, D A B VI—Preparation of, in the Drug Store and Critical Evaluation of the D A B VI Method of Preparation and Assay. The author discusses in great detail the preparation and evaluation of concentrated opium. The pharmacopoeial directions are reviewed and criticisms, suggestions and explanations made. The D A B VI method is discussed under the following headings: I. Extraction of all the strongly basic alkaloids which are precipitated from aqueous solution by ammonia, II. Extraction of the alkaloids not precipitated by ammonia but extractable with ether, III. Extraction of the weak alkaloids precipitated by sodium acetate, IV. Extraction of the non-precipitable alkaloids by shaking out with chloroform phenol after alkalinization with sodium bicarbonate, V. Conversion of the free alkaloids into hydrochlorides. Methods for the estimation of the morphine content of concentrated opium are also reviewed and compared with the official calcium method.—F. HAGELSTEIN *Pharm Ztg*, 80 (1935), 544 (G E C)

Peppermint Oils—Detection of Japanese Mint Oil in In the course of an investigation with large quantities of low-boiling fractions of Japanese oil, furfuraldehyde to the extent of 0.018% was detected. This proportion was found to be sufficient to give a typical aniline acetate color reaction. When the test was applied to American oil, a slight color developed, but to a much smaller degree. The details of the test are as follows: The oil (0.1 cc), measured from a 1 cc pipette (graduated in $1/100$ th cc), is mixed in a test-tube with 5.0 cc of a 2% solution of freshly redistilled aniline in glacial acetic acid added from a burette. The reaction mixture is examined in a 1-cm cell of a Lovibond tintometer (B D H pattern) after an interval of 10 minutes. The reaction mixture must be protected from bright light. Many samples of American oils, Italian oils, French oils, English oils and Japanese oils were subjected to the tests. The results obtained are tabulated.—ANON *Perf Ess Oil Rec*, 26 (1935), 247 (A C DeD)

Pepsin—Action of, Especially in Pepsin Wine. Methods of evaluation are reviewed especially that of Utim (*Brochemische Zeitsch*, (1934), 271). Good results are also obtained by Brandrup's method (*Apoth Ztg*, 43 (1928), No 97). Commercial pepsin wines were tested and it was found that they did not correspond to the standards of the German Phar. VI or contained no pepsin at all.—H. ESCHENBRENNER *Apoth Ztg*, 50 (1935), 795-797 (H M B)

p_H—Conception, Value, and Measurement of. A review.—A. KUFFERATH *Apoth Ztg*, 50 (1935), 348-350 (H M B)

Phenylethylbarbituric Acid—Solubility of, in Ether. One gram of phenylethylbarbituric acid is soluble in 18.6 Gm of anæsthetic ether and 20.2 Gm of pure ether (treated with sodium). One gram of the barbiturate will dissolve in 17.4 Gm and 15.35 Gm of ether containing respectively, 1% and 2% alcohol.—M. ARQUET *Bull sci pharmacol*, 42 (1935), 200 (C T I)

Platinum Metals—Microscopic Identification of. The microbehavior of the elements of the platinum group toward many reagents was observed. The group as a whole, with the possible exception of ruthenium and rhodium, shows a predominating tendency to form salts of definite crystalline form which are possibly, in many cases, complex compounds of the Werner type. The triad made up of osmium, iridium and platinum forms an isomorphous series as is apparent in the isomorphous crystals formed with the same reagent in many of the tests. A method for the microscopical analysis of the group was developed. In the analytical method gold

was separated from the rest of the group by extraction with ethyl acetate, and osmium by distillation of the volatile tetroxide. Both separations are rapid and are advantageous in that interferences in testing directly for the presence of the remaining elements will therefore be lessened by the absence of these two. Numerous tables giving a description of the results of the analyses are shown.—W F WHITMORE and H SCHNEIDER *Mikrochemie*, 17 (1935), 279 (L L M)

Polarization in the Apothecaries' Laboratory The application of polarization in the examination of medicaments with direct and specific action, and in urine analysis is discussed.—ENGELESLEBEN *Apoth Ztg*, 50 (1935), 538-540 (H M B)

Potassium Bromate—Note on Standard Solutions of It was found that potassium bromate may be readily purified by recrystallization. The salt is quite stable if kept in brown stoppered bottles and may be weighed directly to make a standard solution.—M L YAKOWITZ *J Assoc Official Agr Chem*, 18 (1935), 505 (G S W)

Potassium Chlorate and Sodium Chlorate—Determination of Chlorate in Most pharmaceuticals utilize the method of Mohr for the determination of chlorate in potassium chlorate. This method depends upon the liberation of an equivalent quantity of iodine from potassium iodide in the presence of acid, the iodine resulting from the reaction being titrated with thiosulphate. While this method gives satisfactory results if the directions are carefully followed (strong acid must be used) the authors suggest the following method. 0.8 Gm of potassium chlorate is dissolved in 100 cc of distilled water. Ten cc of this solution is mixed with 15 cc of commercial sulphurous acid (about 6% and free from sulphuric acid and chloride). This solution is boiled for ten minutes, small quantities of distilled water being added from time to time to keep the volume constant. After the sulphur dioxide is evolved the chloride content is determined by the Volhard method using potassium thiocyanate. In this method the potassium chlorate is reduced to potassium chloride while the sulphurous acid is oxidized to sulphuric acid. The principal advantage of the method is the getting away from working with strong acids. Mixtures of chlorate and chloride may be determined by running a chloride determination first, then one after the reaction is complete and determining the chlorate by difference. The method works equally well with sodium chlorate.—A ENSINK and J J HOFMAN *Pharm Weekblad*, 72 (1935), 950 (E H W)

Pyramidon—Color Reactions of It is well known that Pyramidon—in contradistinction to antipyrine—gives a purple color with a variety of mild oxidizing agents. Wagenaar (cf *J Am Pharm Assoc, Abstract Sect*, 24 (1935), 171), has suggested potassium persulphate as particularly well adapted to this reaction. The author has comparatively studied the effect of a 5% potassium persulphate solution and a 0.1N solution of iodine as oxidants of pyramidon in solutions of various concentrations. He finds (1) that iodine is much more sensitive, one drop in 5 cc giving a perceptible purple with 0.01% of pyramidon while potassium persulphate gives no reaction with this concentration. (2) In pyramidon solutions of the same concentration the purple color appears more rapidly with iodine than with potassium persulphate. (3) The purple color obtained with iodine is much more lasting than that obtained with potassium persulphate, the color of the latter changing rather quickly to reddish brown.—N SCHOORL *Pharm Weekblad*, 72 (1935), 669 (E H W)

Quinine Iodobismuthate—New Method for the Quantitative Determination of The following method is recommended. Dissolve 1 Gm of quinine iodobismuthate accurately weighed, in 10 cc of acetone, add to the solution of 0.9 Gm of silver nitrate dissolved in 20 cc of water. Remove the acetone by heating on a water-bath, and add 50 cc of 95% alcohol. Allow the precipitate to settle completely by setting the mixture aside for several hours, then decant onto a tared Gooch crucible. Wash the precipitate with three 20 cc portions of 95% alcohol, heating each time on a water-bath and taking care that the lukewarm liquid does not carry any of the precipitate onto the filter. Combine the washings with the filtrate (1st filtrate). Remove the alcohol from the Gooch crucible by drawing through it a current of air, and remove the alcohol from the precipitate in the beaker by adding 10-15 cc of water and heating on a water bath almost to dryness. Wash the precipitate with four 10-cc portions of nitric acid (1:1) each time heating carefully, with agitation, on a water-bath, finally decant the boiling acid liquid onto a Gooch crucible and, after cooling, apply suction. After the fourth washing transfer the entire precipitate to the filter using cold water acidified with several drops of nitric acid and combine the wash water and the acid liquid (2nd filtrate). Wash the precipitate twice with alcohol and then dry

in an oven first at 100° C and then at 130° C to constant weight. The percentage of iodine may be obtained from $p' \times 54.05$, where p' equals weight of silver iodide. Evaporate the 1st filtrate to a small volume on a water bath, removing all the alcohol. Take up the warm residue with 20-25 cc of water and 4 cc of *N* sulphuric acid, transfer to a hard glass tube marked at 50 cc and make up to the mark with the washings from the beaker using hot water. Filter and take a polarimetric reading using a 2 dm tube. The percentage of quinine may be obtained from $-1.68^\circ 15.5 = p'' \times x$, where p'' is the reading observed expressed in degrees and hundredths of a degree. Quantitatively transfer the 2nd filtrate into a 600 cc beaker, using water, then add in small portions, with continuous shaking, a cold saturated solution of ammonium carbonate until a persistent precipitate forms (the beaker should be covered with a watch glass to prevent loss), then add a slight excess of the carbonate solution, boil and then collect the precipitate on an ashless filter, washing 4 or 5 times with hot water. Dry and ignite the precipitate in a small tared crucible. The percentage of bismuth may be obtained from $p''' \times 89.7$, where p''' is the weight of Bi_2O_3 . The results obtained with the above method check those obtained by the method now in use.—LORENZO BRACALONI *J pharm chim*, 22 (1935) 49-52 (S W G)

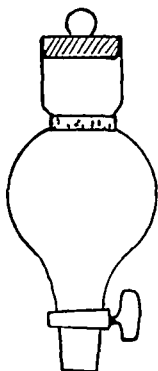
Remedies, Nostrums and Cosmetic Agents—Results of the Examination of The tests on 47 products are reported.—C GRIEBEL *Apoth Ztg*, 50 (1935), 848-850 (H M B)

Santonin—Artemisia of Afghanistan Producing Samples of *Artemisia* species were subjected to microchemical tests to determine the presence of santonin. Five tests described are: (1) A 0.5 Gm sample is extracted for 5 minutes with 5 cc of rectified boiling alcohol. To the extract a small pellet of potassium hydroxide is added and the mixture is shaken and heated cautiously. A carmine color indicates the presence of santonin. (2) A small sample of finely powdered drug is extracted with benzene and then heated over an alcohol flame to volatilize the solvent. One-2 drops of sodium methylate are added—a red orange color indicates santonin. (3) A microscopic examination for santonin crystals. (4) A 0.5 Gm sample is shaken with 5 cc of chloroform, benzene, carbon tetrachloride and alcohol respectively, for 10 minutes. Each filtrate is then evaporated to dryness. If santonin is present, a deep orange color will be produced after adding 2-3 drops of sodium methylate along the edges of the extracts. (5) Same as (4) except potassium methylate is used in place of sodium methylate. A procedure for a chemical analysis and determination of santonin in *Artemisia* is as follows. 13 Gm of coarsely powdered drug is extracted with 65 cc of water for 15 minutes on a water bath and then heated with careful stirring for 15 minutes more after adding 25 cc 4*N* hydrochloric acid. The mixture is cooled and while still tepid is poured into a separatory funnel. After complete cooling, the sample is treated with 13 Gm of tragacanth and 130 cc chloroform and shaken for 1/2 hour vigorously. This is set aside for 1/2 hour and shaken at frequent intervals. The chloroform extract (101.5 cc \equiv Gm of drug) is separated, filtered and concentrated to 5 cc. The concentrate is heated with 100 cc of 5% baryta until all chloroform has been removed and a green yellow resinous precipitate separates. After 5-10 minutes' additional heating the mixture is filtered and the precipitate washed with 100 cc warm water. The filtrate is made acid to Congo red with dilute hydrochloric acid. This solution is heated at 60-70° for several minutes and further acidified with hydrochloric acid and reheated for 10 minutes more on a water bath. The product while still warm is poured into a separatory funnel and extracted with 25, 15 and 10 cc portions of chloroform. The combined extracts are distilled and the dry residue is dissolved in 7.5 Gm of absolute alcohol and 42.5 cc of 60-70° water. The solution is refluxed on a water-bath for 15 minutes and then filtered. The flask is washed with 2-5 cc portions of 15% alcohol (w/w). The cooled filtrate is refluxed with 0.08-0.09 Gm of infusorial earth for 5-10 minutes. The mixture is filtered and the residue washed with 10 cc of 15% alcohol. The filtrate is set aside for crystallization and the product after 24 hours is recrystallized from 15% alcohol and dried at 100-105°. To the weight of santonin obtained is added 0.046 Gm for solubility correction. The article includes a short history of investigation on Indian *Artemisia*—N A QAZILBASH *Bull sci pharmacol*, 42 (1935) 129 (C T I)

Saponification Number—Determination of, in Oils Hard fat, soya bean oil, peanut oil fatty acids tallow, cotton oil palm kernel oil and coconut oil were completely saponified with potassium hydroxide in alcoholic solution after 15 minutes' boiling. Saponification of 89-99.5% and 99-100% were obtained after 5 and 10 minutes' boiling, respectively. It is therefore recommended that the boiling time of the saponification mixture in the determination of the saponifica-

tion number be 15 minutes—J HETZER *Fettchem Umschau*, 42 (1935), 87, through *Squibb Abstr Bull*, 8 (1935), A-938

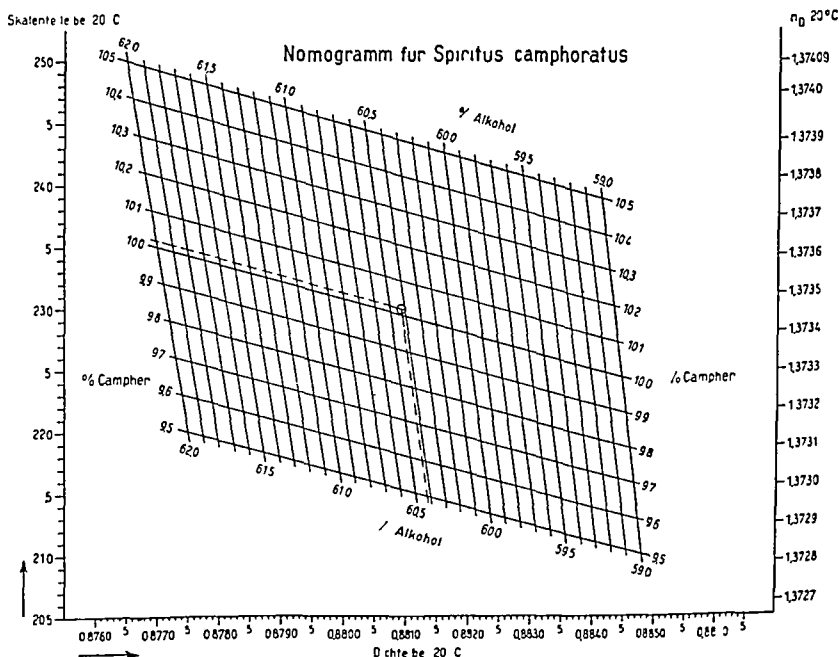
Separatory Funnel A new form of separatory funnel in which a glass filter plate is molded below the stopper The apparatus is used in such cases where ether Soxhlet extractions remove fat when the ethereal solution will pass through while the filter will retain the fat—HANS BARSCH *Pharm Zentralh*, 76 (1935), 379 (E V S)



Solution of Aluminum Acetate, G P VI It is concluded that a large number of the solutions of aluminum acetate on the market have not been prepared according to the official directions, that in properly prepared solutions there is but little change to the basic acetate and gel formation is not observed, turbidities and precipitates are unavoidable, it should be dispensed as a clear colorless liquid by filtering with or without the use of a filtering agent, specific gravity decreases with age with but a slight decrease in the basic acetate content Boric acid was found in only one product The aluminum content may be determined by the method of Matthes and Schutz (*Pharm Ztg*, 43 (1928), 353) or that of Holdermann (*Pharm Ztg*, 45 (1930), 1332) Coagulation tests were also carried out Calcium was determined by the following procedure Weigh accurately 5 Gm of the acetate solution, add 1 Gm of ammonium chloride (instead of 2 Gm as directed by the Pharmacopœia) and proceed as directed in the German Phar under the

determination of aluminum Wash the aluminum hydroxide precipitate with 50 Gm of hot water 5 times by decantation Heat the united filtrates to boiling and precipitate with boiling ammonium oxalate solution in excess (50 Gm) After several hours filter off the supernatant liquid and wash the precipitate by repeated decantations with hot water containing ammonium oxalate free from chlorides, dry, and ignite to calcium oxide—A HANNER and E DICKE *Apoth Ztg*, 50 (1935), 713-715 (H M B)

Spirit of Camphor—Refracto-Densimetric Determination of By means of the illustrated chart the amount of camphor and the percentage of alcohol in the sample may be easily and ac



curately determined by carrying out a density and a refractive index determination at 20° C—E WEBER *Apoth Ztg*, 50 (1935), 642-644 (H M B)

Spirit of Ethyl Nitrite—Preparation and Testing of H points out that the directions of the German Phar for preparing this spirit are deficient for the preparation of a strong product (24+ %) Attention is called to the fact that the reducing action of the alcohol on the nitric acid takes place in the warm and that it is of advantage to use a long condenser with an adapter dipping into the alcohol and to use absolute alcohol The following determination for the minimum content is given Place 10 cc of 0.1N silver nitrate in a medicine bottle, rinsed with distilled water, and introduce 10 Gm of the spirit, 20 Gm potassium chlorate solution (5%) and 5 Gm nitric acid (25%) Close the container and allow to stand with frequent vigorous stirring for $\frac{1}{4}$ hour In the filtrate hydrochloric acid does not produce a turbidity or precipitate This corresponds to a minimum density of 0.835 or 1.88 Gm of ethyl nitrite in 100 cc of spirit, a maximum density permitted should be 0.845 equal to 1.9 Gm of ethyl nitrite—G HAMANN *Apoth Ztg*, 50 (1935), 922-923 (H M B)

Strychnine and Quinine—Quantitative Determination of, in Mixtures The distribution ratios of strychnine and quinine between aqueous hydrochloric acid and chloroform and hydrochloric acid sodium chloride solutions and chloroform are reported and this information is applied in a study of the methods for separating these alkaloids which have been published by Evers (*Pharm J*, 109 (1922), 90), a modification by Evers and Haddock (*Quart J Pharm Pharmacol*, 4 (1931), 314) adopted by the Brit Phar, and the method of the Dan Phar, 1933 The first of these methods employs 2N hydrochloric acid, the two latter methods use 1N hydrochloric acid and saturated, aqueous sodium chloride, mixed 1:1 The distribution coefficient of strychnine between chloroform and 2N hydrochloric acid is approximately 1.0, while that of strychnine between chloroform and the acid salt mixture is about 3.2 at room temperature Using ordinary commercial chloroform no constant distribution ratios can be obtained with quinine This is shown to be due to the content of alcohol present as a stabilizer in such chloroform Using alcohol free chloroform constant values are obtained The distribution of quinine between chloroform and 2N acid is approximately 1.6×10^{-2} , while its distribution between chloroform and the acid salt mixture is about 3.4×10^{-2} This information is applied in the assay methods above cited Thus, assaying Easton tablets by the Dan Phar method, after 5 extractions of the aqueous solution of the tablets with one half volume of chloroform, about 1% of strychnine will remain in the aqueous layer In the after extraction of the chloroform extract with acid-salt solution (2×5 cc) about 2.6% of the strychnine enters the aqueous phase In a single extraction of this with 10 cc chloroform about 80% is reextracted, leaving 0.6% of the strychnine content of the assay specimen Thus the loss of the alkaloid in process is about 1.0% plus 0.6% or 1.6% If the process of extracting with anhydrous ether described in the Dan Phar is conducted the loss may be brought under 1% As to quinine, with the use of alcohol free chloroform in Ever's method about one third as much chloroform is held back in the chloroform layer as when using chloroform which contains alcohol Using the commercial chloroform in the Dan Phar method about 0.028 Gm of quinine base remains in the strychnine, but the ether extraction removes this Using alcohol free chloroform the amount of quinine remaining in the strychnine is lessened A little strychnine tends to be removed suspended in the wash-ether, this is collected on a filter and returned by dissolving in 10 cc chloroform Titrations in alcoholic solution using a methyl red methylene blue indicator mixture are recommended both for total alkaloid and for the strychnine assay—F HALSTROM *Dansk Tidsskr Farm*, 9 (1935), 181 (C S L)

Strychnine Salts—Micromethod for the Identification of The strychnine salts are heated with a 4% sodium glycerophosphate solution which results in a characteristic crystalline precipitate By this method small quantities of strychnine sulphate, strychnine nitrate, strychnine phosphate and strychnine glycerophosphate may be identified in mixtures with other alkaloids—v KLOBUŠIČEK *Freie Apoth Stimmen* (Aug 17, 1934), 18, through *Pharm Tijdschr Nederland-Indië*, 13 (1935), 56 (E H W)

Sweet Lupines—Chemical Method for Rapid Determination of Alkaloid Content of, for Breeding Dissolve 0.8 Gm of potassium iodide and 0.4 Gm iodine and dilute to 1,000 cc with distilled water This solution gives a color reaction with alkaloids when these are present in about 0.1% concentration For further separation for solutions containing under 0.1% alkaloids, use a stronger solution made up of 1.2 Gm potassium iodide and 0.6 Gm iodine and diluted to 1,000 cc with distilled water—E KUNZ and J HOREL *Sbornik Českoslov Akad Zemedelske*, 10 (1935), 95, through *Chem Abstr*, 29 (1935), 4520

Syrup of Ferrous Iodide The syrup prepared according to the official process does not always meet the requirements of the D A B When 42 parts of iodine are used in place of the 41 directed a satisfactory preparation is obtained Inability to prepare an unobjectionable syrup is attributed to failure to comply rigidly with the D A B VI directions to add the iodine very slowly with constant cooling to the iron-water mixture The following method employed by the author yields a preparation with the required iodine content The iron-water mixture is placed in a strong, glass stoppered flask which is cooled by immersion in ice water For the preparation of 250 Gm of syrup the iodine is introduced in 10-12 portions, the flask being kept tightly stoppered between additions —P HORKHEIMER *Pharm Ztg* 80 (1935), 441

(G E C)

Tartaric Acid—New Reaction of A solution containing 2 Gm of resorcin and 10 Gm of potassium bromide dissolved in 100 cc of distilled water is prepared and 1 cc of concentrated sulphuric acid is added One-tenth cc of the above reagent 2 cc of sulphuric acid and 0.1 cc of tartaric acid solution are mixed in a tube The mixture is then placed in a boiling water bath, and at the end of one minute a pale blue color appears, which becomes deepest at the end of five minutes If 1 cc of distilled water is added, the color changes to red and further dilution only changes the depth of the red color If the solution is neutralized, the color changes to violet This reaction is specific for resorcin, as other phenols do not react in this manner The reaction can be used to identify tartaric acid even in the presence of bromides, nitrites, bromates and iron compounds —MAURICE PESEZ *J pharm chim* 21 (1935) 542 (M M Z)

Tollens' Reaction—Use of, in the Analysis of Medicinal Products Tollens reaction can be applied to a large number of substances Guaiacol can be determined by it in mixtures with other substances The optimal quantity is about 0.05 Gm —R SAN MARTÍN CASAMADA *Farm Moderna*, 46 (1935) 89 (A E M)

Ultraviolet Absorption—New Apparatus for Measuring The apparatus depends upon the use of a set of 25 quartz plates 0.5 mm thick, and the comparison of the absorption by the quartz plates and the sample A table is given showing the values in wave lengths (A) and densities for the series of plates The use of the apparatus is explained in detail and an illustration is given —R FABRE and L AMY *J pharm chim*, 22 (1935), 5-15 (S W G)

Variation Statistics of Drugs—Contribution to Three tables accompany the article one showing the fixed oil content of sweet almonds, one of the fixed oil content of bitter almonds and one giving the amygdalin content of bitter almonds As a rule, the smaller cotyledons have a higher percentage of oil In the case of amygdalin content both cotyledons generally contain about the same amount of glycoside, and the percentage of amygdalin in a single cotyledon does not vary far from the average value In many cases the fatty oil content of the two cotyledons of bitter almonds varies more than the amygdalin content The average values for the oil content of the two cotyledons of both sweet and bitter almonds differ by very little —L ROSENTHALER *Scientia Pharm*, 6 (1935) 79 (M F W D)

War Gases—Detection of A discussion of the importance of detecting the presence and nature of war gases, of methods of investigation in the laboratory, of sources of error and of the practical realization of detection in actual warfare —LUCIEN LEROUX *14me Congres de Chimie Industrielle Paris* (Oct 21-27, 1934), 7 pp (A P C)

Yohimbine—Composition of Commercial The authors found that a number of commercial preparations of yohimbine consisted principally of a base which possessed the melting point and optical rotation of isoyohimbine —J P WIBAUT and A J P VAN GASTEL *Rec trav chim* (1935) 85, through *Pharm Weekblad* 72 (1935), 879 (E H W)

Zinc—Estimation of, in the Presence of Iron, Aluminum, Uranium, Beryllium and Titanium About 1-7 mg of potassium zinc sulphate $K_2SO_4 \cdot ZnSO_4 \cdot 6H_2O$ (double recrystallized) corresponding to 0.15-1 mg of metallic zinc were weighed into a microbeaker and dissolved in about 1.5 cc of water The necessary amount of any of the foreign elements (Fe Al U Be and Ti) in the form of solution of one of their suitable salts was added to this solution Iron must be present in the ferric state or converted into the latter by oxidation with a few drops of bromine water 0.4-1 cc of a 5% sodium tartrate solution was then added to the zinc salt solution and ammonia vapor was blown over its surface until the latter smelt of ammonia The zinc was now precipitated by adding drop by drop, to the mixture a solution of quinaldinate (equivalent to 1 Gm quinaldic acid per 100 cc of solution), rotating the beaker occasionally during the addi

tion of the reagent 0.2-0.25 cc of the reagent in excess of the theoretically required amount (0.2-1 cc) was added in each case. The alkaline tartrate prevents the precipitation of iron, aluminum, etc., by quinaldine acid. But as zinc quinaldinate is appreciably soluble in alkalis the excess ammonia was removed by blowing air through a capillary over the surface of the mixture at a temperature of 60° C. The microbeaker was gently warmed on its stand in the water-bath. Temperatures higher than 60° C must be avoided to prevent reduction of ferric to ferrous iron which at once forms ferrous quinaldinate that precipitates along with or is absorbed by the zinc quinaldinate. As soon as the ammonia was removed, the solution was rapidly cooled, and filtered at once through Emich's asbestos packed filterstick. The zinc precipitate was washed with hot water and then dried in the Benedetti Pichler drying apparatus in a current of air at 125° C. Weighings were made in a Kuhlman's balance. The zinc precipitate contains 15.29% zinc according to the formula $Zn(C_{10}H_8NO)_2 \cdot H_2O$ —P. RAY and M. K. BOSE *Mikrochemie*, 18 (1935), 89 (L. L. M.)

Zinc—Microdetermination of, by Means of Anthranilic Acid A comparative study of the techniques of Pregl and Emich. An excess of 0.3-0.33 cc of reagent should be used in the assay, the exact amount to be determined by a preliminary test. The use of reagent in excess of this amount affords results about 1% too high—C. CIMERMAN and P. WENGER *Mikrochemie*, 18 (1935), 53 (L. L. M.)

TOXICOLOGICAL CHEMISTRY

Coniine and Nicotine—Microchemical Detection of Coniine may be detected in the urine in cases of poisoning from the alkaloid by the following procedure. About 100 cc of urine, alkalized with potassium hydroxide, are extracted twice with 50 cc portions of ether. The combined ether extracts are shaken 4 times with 1 cc of 1% hydrochloric acid. The separated aqueous liquid is warmed to expel the ether, transferred to a 50 cc Erlenmeyer flask and alkalized with potassium hydroxide. A 1 cm glass tube, 10 cm in length and widened at one end to a diameter of 2 cm, is now inserted into the neck of the flask through a tight-fitting stopper. The widened end of the tube is covered with a short microscope slide on the under side of which has been placed a drop of reagent. The latter consists of a saturated solution of picrolonic acid in 20% alcohol. The Erlenmeyer flask is then placed on a hot plate at 150-160° C and the slide is weighted with a 20 Gm weight. The vapors of the alkaloid form a precipitate in the drop of reagent which is seen to possess crystalline form when viewed under the microscope. The micro melting point of coniine picrolonate thus obtained, after careful washings with water, is 192-194° C. Nicotine picrate melts at 218° C. By this method 50γ of coniine may be detected in 50 Gm of urine corresponding to a dilution of 1:1,000,000. This alkaloid may also be detected in tissues by the same method after first extracting the alkalized tissue with ether. Coniine may be identified also by the micromelting point of coniine hydrochloride sublimate, but the determination cannot be made with quantities less than 200γ. The micromelting point is 218° C. Nicotine may be identified by the use of the apparatus described. In this case the reagent consists of a saturated solution of picric acid—R. FISCHER and W. PAULUS *Mikrochemie*, 17 (1935), 356 (L. L. M.)

Ethyl Bromide—Detection of Very Small Quantities of, in Blood and Brain Tissue Minute quantities of ethyl bromide can be detected in small samples of blood or brain tissue by distilling and passing the distillate over a red hot quartz tube which converts the ethyl bromide into hydrogen bromide. After careful neutralization of the distillate the bromine is determined colorimetrically by treatment with chloramine and fluorescein which is converted into eosin by the bromine liberated. Experimentally the method was shown to be accurate quantitatively within 5%—FRIEDRICH L. HAHN *Compt rend* 201 (1935), 269 (G. W. H.)

PHARMACOGNOSY

VEGETABLE DRUGS

"Chih-Mu"—Anatomy of the Drug The drug "Chih-Mu" is the dried rhizome of *Anemarrhena asphodeloides* Bunge (*Liliaceae*). This plant is a native of Northern China and was introduced into Japan between 1715 and 1735. Microscopic studies of this drug may be summarized as follows. *A. asphodeloides* belongs to the monocotyledons in spite of the fact that the vascular bundles are parallel and that there are seldom any lignified cells forming a sheath around

the vascular bundles The endodermis is generally not well defined Long, thin bundles of prismatic crystals which are surrounded by a cork-like membrane occur in the intercellular spaces The oil cells which are occasionally found in the cork layer contain volatile oil and their walls consist of pectinous substances Starch grains are found only in the tip of the rhizome The original article contains 11 figures illustrating the anatomy of this drug An explanatory key is given in the original abstract —N FUJITA and M FUJITA *J Pharm Soc of Japan*, 55 (1935), 71-72

(R E K)

Compositæ Leaves—V Pharmacognostic Study of The article consists of a table containing anatomical characteristics of the following classes of Ligulifloræ Cichorieae-Scolyminae Cichorieae Cichorinæ, Cichorieae Leontodontinæ, Cichorieae Crepidinæ The species included are Scolymus (2), Hymenonema (1), Cichorium (2), Lapsana (2), Scorzonera (1), Zacyntia (1), Rhagadiolus (2), Hypochoeris (3), Arnopogon (1), Leontodon (3), Picris (2), Tragopogon (6), Podospermum (2), Scorzonera (7), Andryala (1), Chondrilla (2), Taraxacum (3), Launaea (2), Microrhynchus (2), Sonchus (5), Lactuca (14), Picridium (1), Crepis (2), Prenanthes (3), Hieracium (8) The table includes a description of the cell wall, cuticle, epidermal cells, stomata mesophyll and epidermal hairs —W HIMMELBAUR and T KALTSCHMID *Scientia Pharm*, 6 (1935), 69

(M F W D)

Karkade There has come onto the market in comparatively recent times in Switzerland a drug under the name of karkade The drug is an annual shrub *Hibiscus Sabdariffa*, native to tropical America and cultivated in the East Indies, Java, Sumatra, Ceylon, tropical Africa and the West Indies The leaves may be used as a salad, medicinally for various conditions of inflammation, or as a coagulation medium for rubber The seeds when roasted can be used as food The calyx, which becomes fleshy when the fruit is ripe, is used in many ways for food and drinks It has gentle laxative properties The paper gives gross and microscopic description of the calyx and epicalyx and of the epidermal hairs Microphotographs accompany the description A short chemical investigation is made and indicates the presence of oxalic, malic, citric and tartaric acids which provide the taste —K LEUPIN *Pharm Acta Helv*, 10 (1935), 138

(M F W D)

Microscopic Mounts—Permanent Aqueous Specimens which must be kept in aqueous mountings may be preserved by sealing the edge of the cover slip with a melted wax made as follows Heat anhydrous wool fat with not more than 20% rosin, until the constituents are blended The mixture is firm at ordinary temperatures but becomes liquid on heating The slide and cover slip should be dry when the wax is applied, and the wax must come on top of the slip all the way around —H R SMITH *Ind Eng Chem, Anal Edit*, 7 (1935), 286 (E G V)

Myrrh from Kenya A sample from the Mandera district, a sample from the Wajir district and a 5 cwt trial consignment all met the requirements of the B P —ANON *Bull Imp Inst*, 33 (1935) 134-136

(A P C)

Sandalwoods—Structure of Some A discussion of a paper which appeared in the 'Bulletin of Miscellaneous Information' (Kew), No 4 1935, by Dr C R Metcalfe, describing the structure of the following Santalaceæ *Santalum album*, East Indian sandalwood, *S freycinetianum* Gaud, Hawaiian sandalwood, *S austro caledonicum* Vieill, New Caledonian sandalwood, *S Yasii* Seem, Fiji sandalwood, *Eucarya spicata* and *E acuminata* Sprague et Summerhayes, which yield Australian sandalwood, and *Exocarpus latifolius* R Br, also from Australia is given The author states that no reliable macroscopic characters have been found whereby it is possible to distinguish the wood of *Santalum album* from the various local sandalwoods belonging to the same genus The microscopical differences between the genera *Santalum* and *Eucarya*, do not appear to be more clearly defined than those existing between the various species within the genus *Santalum* The wood structure of all the Santalaceæ examined is remarkably similar *S album* is easy to identify on account of its taller rays, and the structure of *Eucarya spicata* cannot readily be confused with that of *S album* A table is given which shows the more important measurable characters by which the species may be distinguished A short discussion of each species is also included —ANON *Perf Ess Oil Rec*, 26 (1935), 244

(A C DeD)

Scrophularia Species—Pharmacognosy of the Roots and Rhizomes of Two The Chinese drug 'Hsuan-shen' is said to be derived from *Scrophularia Oldhami* Oliv Comparison of the fresh roots with those obtained in commerce corroborated this statement The fresh root reaches 10 cm in length, 2 cm in thickness and is somewhat spindle shaped The drug is dark or blackish

brown, dark colored within, tastes sweet at first and then rather bitter. The epidermis of the thick tubers changes into a metadermis. The outer layers contain thickened, mottled, stone cells, either singly or in clusters. The radially elongated woody portions consist of both parenchyma and scattered lignified tubules, frequently accompanied by wood fibers. There is no core at the center of the root. Starch and crystals are entirely absent, inulin occurs in the parenchyma cells. The underground portions of *S. Patriniana* Wydl. (= *S. Duplicato-Serrata* Makino) consist largely of rhizomes which have no stone cells in the outer bark and a core of parenchyma tissue at the center of the rhizome. The anatomical details as well as external appearances of the two drugs are portrayed in 13 figures.—T. MUNESADA. *J. Pharm. Soc. Japan*, 54 (1934), 41-48.

Star Anise—Poisonous Species of H. finds that commercial samples of genuine star anise (*Illicium verum* Hook. fil.) contain also the fruits of the poisonous Japanese star anise (*Shikimi*, *Illicium anisatum* L., *Illicium religiosum* Sieb. and Zucc.) and that this adulterant may be detected by cooking cross sections through the columella or the fruit stalks in chloral hydrate and adding phloroglucinhydrochloric acid. In the genuine anise appear red-colored astrosclereids, these are lacking in the poisonous fruits. In this manner 20-50% admixtures may be detected.—HAHMANN. *Apoth. Ztg.*, 50 (1935), 335 (H. M. B.)

Viscum Album L. A review of the history, botanical, pharmacognostical, chemical and pharmacological studies of this ancient drug.—R. KRESS. *Apoth. Ztg.*, 50 (1935), 453-455 (H. M. B.)

ANIMAL DRUGS

Endocrine Glands—Microscopy of Powdered Desiccated A study has been made of the microscopy of certain powdered desiccated glands with a view of providing standards for them. An abstract of a paper presented before Section N3, American Association for the Advancement of Science, at the Minneapolis meeting, June 27, 1935, is given. The descriptive microscopical standards are given for thyroid, suprarenal, whole pituitary, anterior pituitary, posterior pituitary, ovary, ovarian residue and corpus luteum.—HEBER W. YOUNGKEN. *J. Am. Pharm. Assoc.*, 24 (1935), 576 (Z. M. C.)

PHARMACY

GALENICAL

Atropine Eye Ointments—Deterioration of, on Storage A thorough investigation of eye ointments containing atropine was made with a view to determining the effect of storage on their alkaloidal content. Results of the investigation are given in table form. Atropine Eye Ointment, B. P. C. 1923, was found to lose strength when stored in collapsible tubes, although the loss was only 4.8% compared with 16.3% in the case of the material in capsules. The rate of deterioration diminishes very considerably after about a month. Yellow Eye Ointment with Atropine, B. P. C. 1923, showed the most marked loss of atropine. The strength of the material in glycerogelatin capsules falls more quickly than the portions stored in collapsible tubes and jars. The recorded alkaloidal deficiency is startling, the capsules losing 24.5% in twenty days and 89.5% in 189 days, the corresponding figures for the ointment stored in tubes being 15.2% and 86.4%. The deterioration of Eye Ointment of Atropine with Mercuric Oxide, B. P. 1932, is not affected by the capsule material. In the first month after manufacture the loss of atropine amounts to 20.5%, and during the full period of observation the loss was 32.8%. Iodoform and Atropine Eye Ointment, B. P. C. 1934, maintained its alkaloidal strength best, the loss after storage for 189 days being 4.2%. The mode of packing did not influence the results.—N. L. ALLPORT. *Pharm. J.*, 135 (1935), 4 (W. B. B.)

Cinchona and Belladonna—Percolation of Rate of Alkaloidal Extraction and Effect of Degree of Comminution It was found that moderately fine powder shows most rapid extraction of total solids, and also gives quicker extraction of alkaloids of cinchona. Also, in the case of cinchona, the inert material is extracted more rapidly than the alkaloids. After extraction of 50 cc. fractions of percolates from belladonna root it was apparent that an optimum degree of comminution exists for the extraction of total solids of belladonna root, namely, a 44-85 powder.—A. W. BULL. *Pharm. J.* 134 (1935), 792 (W. B. B.)

Crude Drug Extraction In a continuation of a previous work C discusses the extraction of crude drugs and states that the following factors determine the design of equipment to be used (1) rate of penetration which is a function of the porosity of the drug and the size of the particles involved This is accomplished by soaking or maceration, mixing pressure and vacuum, (2) rate of solution which is influenced by mixing, heat, vacuum and pressure (3) rate of diffusion which depends upon the structure of the cell wall temperature and pressure of the menstruum centrifugal force and pressure, (4) rate of separation is accelerated by pressure and centrifuging, pressure by means of steam or air or by presses appears to be the most efficient in accomplishing this end and (5) rate of concentration The Stokes vacuum process and the Scott process of extraction are discussed—*Drug and Cosmetic Ind.*, 37 (1935) 36-38 (H M B)

Digitalis Tincture—Preparation of Relative Merits of Maceration and Percolation The full activity of digitalis leaf is readily extracted by a maceration process a period of two days with occasional shaking being as effective as the official percolation process although the latter gives a higher total solids figure As percolation can yield varying results in the hands of different workers, particularly on a small scale it is suggested that the official process should be changed to the simpler process of maceration which would facilitate the preparation of small quantities of the tincture—H BERRY and H DAVIS *Pharm J.*, 135 (1935), 7 (W B B)

Dilutions—Preparation of, according to the Homeopathic Pharmacopœia The author laments the fact that the prescribed methods are not accurate for the preparation of high dilutions Preference is given to the so called one glass method for preparing high dilutions of liquids—H NEUEBAUER *Pharm Zentralk.*, 76 (1935) 405 (E V S)

Distilled Water, Sterile—Apparatus for the Preparation of Since the full significance of the *Aqua destillata sterilisata* of the Swiss Phar V is not appreciated by the pharmacists the justification for this preparation is set forth and its importance stressed Three types of small scale distilled water apparatus previously described in detail are compared from the standpoint of ease of operation and cleansing degree of efficiency, quality of the product based on the Swiss Phar V requirements and economy of operation It is shown that the Kontadest-Apparatus (Buchl *Schweiz Apoth.-Ztg* 72 (1934) 61) yields a distilled water meeting the pharmacopœial requirements at the lowest cost per liter—BÜCHL *Schweiz Apoth.-Ztg* 73 (1935), 397, 417 (M F W D)

Dried Extracts of the New Swiss Pharmacopœia—Hygroscopicity of The new pharmacopœia has substituted dry extracts for the classical soft extracts to a greater degree than before The following is the degree of hygroscopicity of the dry extracts as given by the pharmacopœia only slightly hygroscopic extract of aloes, somewhat hygroscopic extracts of opium, cinchona, *Rhamnus purshiana* hyoscyamus, *Rhamnus cathartica* and valerian, hygroscopic, extracts of belladonna, digitalis gentian rhubarb, strychnine cola, ipecac ergot and oxgall Since the purpose of the paper is to show the result of exposure of the extracts to the air under conditions prevailing in the pharmacy the only factors taken into account were those of time of exposure and moisture absorbed The sample of extract was transferred to a tared bottle and weighed accurately The bottle was then opened for one minute, closed and reweighed The process was repeated leaving the bottle open for periods of 3 to 10 minutes in the author's pharmacy A similar series was carried out in a laboratory very close to the seashore, the bottle being opened for periods of 2, 5, 15 and 60 minutes and lastly for 24 hours The results were tabulated The amounts of moisture found to be absorbed do not correspond so well to the terms applied by the pharmacopœia Of practical importance to the pharmacist is the fact that the absorption of moisture during the first minute is quite rapid for extracts of digitalis and opium Another point of interest is that all the extracts continue to absorb moisture for a long time so that a preparation will be cut down in potency by dilution and probable alteration as a result of moisture—C BÉGUIN *Pharm Acta Helv* 10 (1935) 131 (M F W D)

Drug Extraction III Function of Preliminary Maceration in Relation to the Percolation of Belladonna Root A historical review shows by tabulation the changes made by the U S P since 1840 Various suggestions made by investigators since 1833 are briefly reviewed Comparative percolations were carried out using the U S P process somewhat modified and with varying amounts of liquid used for moistening Tables show the amount of alkaloid obtained amount of extractive and per cent of total alkaloid Rate of extraction was found to be equally rapid whether moistened with 25 cc or not Increase in moistening liquid reduced yield in first

percolate but in all cases it was all contained in the first 280 cc of percolate. Another experiment varied the time. Again, alkaloid, total extraction and per cent of alkaloid are shown and results indicate that maceration before or after packing is of no appreciable value in promoting rapid extraction. Preliminary maceration was varied and results indicate no particular advantage. In discussing results the author compares them with the findings of other investigators. In the case of powdered drugs that swell only slightly in the menstruum used, apparently the preliminary maceration serves no useful purpose. As to quantity of liquid used, similar results have been found with other drugs. Previous workers have not explained why increase in liquid decreases rate of extraction. Several factors seem to have a bearing. When no liquid is used all of the reserve percolate must have traversed the entire column of drug. When moistened before packing most of the first percolate has not traversed the entire column of drug. With 90 cc of moistening liquid and 80 cc of reserve percolate, more than 10 cc of the moistening liquid remains and it has traversed the greatest distance. With 25 cc of moistening liquid, extraction was as good as when the drug was packed dry indicating that small quantities may become rather fully saturated. When more liquid is used than can become saturated, the reserve is less concentrated. Maceration after liquid begins to drop is of little benefit in percolation of belladonna, casting doubt on the wisdom of the 48 hour maceration period of U S P X for fluidextracts. Saving of time is important. Perhaps the U S Pharmacopœial Revision Committee might introduce a type process for percolation without maceration either before or after packing. The process could be specified for drugs that can be extracted as well without as with maceration.—WILLIAM J HUSA and S B YATES *J Am Pharm Assoc*, 24 (1935) 538 (Z M C)

Drug Extraction IV Effect of Variation in Solvents on the Extraction of Jalap Jalap was selected as a typical resin-containing drug and the effect of solvents studied in relation to swelling, penetration, inhibition and extraction. Thin strips of jalap tissue were measured before and after addition of solvents. Swelling equilibrium was attained during the first minute in water but not for 40 or more minutes in alcohol. Testing penetration on blocks, it was found to be rapid during the first hour. Between three and nine hours there was a sharp drop in weight probably due to loss of soluble constituents, followed by an increase. Swelling of blocks in water reached a maximum of 31% in nine hours. Alcohol caused little swelling and glycerin caused slight shrinkage. Extraction of resin was as complete in 15 minutes as in 24 hours but total extraction increased with time. Alcohol 4 volumes, water one volume extracted less resin than more alcoholic mixtures. Alcohol of U S P strength and absolute alcohol seem to be best solvents for extraction of jalap resin, with more water more inert extractive is obtained.—WILLIAM J HUSA and PAUL FEHDER *J Am Pharm Assoc*, 24 (1935), 619 (Z M C)

Emulsions Experiments described in this paper indicate that as a general rule, the homogenization of an emulsion containing more than 74% by volume of disperse phase leads to a partial breakdown, and accordingly emulsions which are to receive this treatment should not contain a larger percentage of disperse phase than 74. On the other hand if the emulsion is prepared by agitation alone then the percentage of disperse phase should be at least 74 by volume otherwise it is very probable that creaming would occur. Very stable non creaming emulsions are possible if the continuous phase can be induced to set to a jelly-like form by the addition of a substance such as gelatin.—J B PARKE *Pharm J*, 135 (1935) 8 (W B B)

Emulsions—Pharmaceutical An extensive review of the theories of emulsion formation is offered. Three series of experiments were conducted (1) Cod liver oil emulsion of the German Phar VI in which the proportions of gum, tragacanth, lime, calcium hypophosphite and benzaldehyde remain unchanged and the cod liver oil (200–300 parts) cinnamon water (255–383 parts) and glycerin (38–57 parts) were altered, these varied emulsions were prepared according to the pharmacopœial directions and after five hours were pressed twice through a small hand homogenizer and again in 18 hours, they were then observed at the end of 8 and 14 days and 7 weeks. Those containing more than 250 parts of oil, 320 parts of cinnamon water and 47 parts of glycerin separated after 7 weeks. (2) Cod liver oil emulsions were made according to the following directions. Allow all of the tragacanth, which should be of the best quality to swell with 200 Gm water in a wide-necked flask for 2 days at room temperature (15–20° C) then pour through a single layer of gauze rub all portions remaining behind in a mortar with some water, pour through the gauze wash with water and add to the freshly prepared gum mucilage. Dissolve the hypophosphite in 150 Gm water mix in a large flask with the lime water and the gum-tragacanth mixture bring

to 590 Gm with water and shake for $\frac{1}{2}$ hour In 50 Gm of the cod liver oil, dissolve the vanillin by gentle warming on a water-bath to 40°C , add peppermint oil and benzaldehyde and shake with the previous mixture Add the remainder of the oil in six portions with shaking After standing for 3 hours add nupagin dissolved in a mixture of alcohol and tinctures, and mix vigorously Ten emulsions were prepared with oil varying in amounts from 200–300 parts, lime water 25–38, salts 4 5–6 7, water 255–395, aromatic nupagin 6 0–9 0 These were treated after 5 and 18 hours as under (1) In every case an emulsion was prepared which settled but slightly after six weeks (3) Saponin, tylose (6–7 Gm tylose S 400 to 300–350 Gm water) and pectin emulsions were also studied—W KERN, A BÜCHNER, W LEOPOLD and H MOMSEN *Apoth Ztg*, 50 (1935), 691–697 (H M B)

Ergot—Effect of Hot Solvents on Note on Effect of Storage on Activity of Ergot. The effect of hot solvents on original ergot has been investigated Ether, dichlorethylene, trichlorethylene and benzene extract the major portion of the alkaloids, light petroleum does not extract the alkaloids In the case of dichlorethylene and benzene, quantitative recovery of the alkaloids has been made, proving that the alkaloids are extracted and not destroyed by the solvents *Ergota Preparata* has been found to retain its alkaloidal strength over a period of eighteen months—R F CORRAN and F E RYMILL *Pharm J*, 134 (1935), 782 (W B B)

Extract of Belladonna—Preparation of Dry The following directions are offered for the preparation of this extract (1) *By Maceration*—Extract 500 Gm of the leaves with 4,000 Gm of diluted alcohol, express (yield about 3,800 Gm), evaporate the liquid extract to 1,200 Gm, add 1,200 Gm water to precipitate the chlorophyll, evaporate 5,000 Gm of the extract in a vacuum and dilute the dry extract if necessary by dextrin Yield of alkaloids by this method is not very great (2) *By Percolation*—Moisten 500 Gm of coarsely powdered leaves with 200 Gm diluted alcohol, percolate with diluted alcohol (as directed in the Swiss Phar) (800 cc) and 1,000 Gm water, collecting 1,000 Gm of percolate, evaporate in a vacuum to 300 Gm and add 300 Gm of water to precipitate the chlorophyll and proceed as in (1)—W BRANDRUP *Apoth Ztg* 50 (1935), 921–922 (H M B)

Extract of Ipecac—Preparation of Aqueous A comprehensive review of the work performed shows that the alkaloidal content of the finished preparation depends upon the following factors degree of fineness of the drug, the concentration of the infusion and the use of an acid to aid in the extraction of the alkaloids The acids used are either hydrochloric or citric acids The results and findings of the various authors are tabulated in fifteen tables—F GSTIRNER *Pharm Zentralh*, 76 (1935), 421, 437 (E V S)

Fluidextract of Ergot. Fluidextract of *Secalis cornuti* is a pharmacopœial product frequently employed therapeutically Of the various methods employed in the preparation of this fluidextract the least logical is that given in the Russian Phar The most rational method of preparation of this fluidextract is that given by the American Phar, since this method gives a maximal extraction of the alkaloids One of the favorable factors of stability of alkaloids and fluid extracts is a proper concentration of the hydrogen ions, a medium of a p_{H} of 3–4 is most satisfactory The fluidextract must be kept at a temperature of $15\text{--}20^{\circ}\text{C}$ in one ounce bottles, of a brown color, tightly covered with oiled paper to prevent the entrance of air When the stopper is removed for a sufficient length of time the alkaloid content is rapidly decreased The fluidextract loses 50–60% of its alkaloids after having been kept under the usual conditions of a drug store over 6 months Fluidextracts are unstable products under usual conditions—G Y TROPP *Sovets Pharm*, 3 (1935), 23 (A S)

Gauze Containing Yatren—Sterilization of This type of gauze may be sterilized in an autoclave at 120°C for 15 minutes Laboratory tests show that Yatren when heated to 130°C for a long time shows no appreciable change, at 135°C sintering begins with no sharp melting point, at 140°C an orange to gray-yellow color appears, at 170°C the preparation becomes darker changing gradually at 200°C to a dark gray-brown color with no splitting off of iodine The following method is offered for the determination of the Yatren content Boil 2–3 Gm of gauze with 100 cc water and 10 cc of normal alkali filter and boil twice with water Add sufficient 1% potassium permanganate so that an excess remains after 15 minutes' boiling The excess is then reduced by some drops of alcohol Pour the cooled liquid into a 250 cc graduated flask, make to mark and filter through a double filter discarding the first portions of the filtrate Acidify 200 cc of the clear filtrate with dilute sulphuric acid add 10 cc potassium iodide solution and ti

trate the iodine with 0.1N sodium thiosulphate $1 \text{ cc } 0.1N \text{ Na}_2\text{S}_2\text{O}_3 = \frac{0.0127}{6} \text{ Gm iodine} -$

Muntsch Apoth Ztg, 50 (1935), 574-575

(H M B)

Glass—Color of, Used to Protect from Light Various types and colors of colored glass containers are tested by filling with a potassium iodide solution acidified with sulphuric acid which is then exposed one-half hour to ultraviolet light from a quartz lamp or one hour to direct sunlight, and the freed iodine is titrated. The results are tabulated. The red and brown glasses protect the solution best.—A JERMSTAD and O OSTBY *Arch Pharm og Chem*, 42 (1935), 463

(C S L)

Glycols—Some Properties of, with Special Reference to the Use of Propylene Glycol as a Solvent in Pharmaceutical Preparations The glycols, as a class of solvents, have developed rapidly during the last few years, but for pharmaceutical purposes have been almost completely ignored. The reason for this is due to the probable high toxicity of these compounds. It has been shown that diethylene dioxide is definitely toxic and ethylene glycol very probably gives rise in the human body to diethylene dioxide. Propylene glycol is less toxic than ethylene glycol, is probably innocuous and was therefore chosen for experiments demonstrating the following suitability of propylene glycol in other solvents, solubility of alkaloids, solubility of inorganic substances. Some dyes (Bordeaux B, brilliant green, methylene blue, orange G, tartrazine, trypan blue) were found to be reasonably soluble. Simple syrup and a number of concentrated solutions for syrups were miscible in all proportions. Arachis, linseed, olive and persic oils were immiscible, castor oil, especially at very high temperatures, was partly miscible. Volatile oils and some tinctures were partly immiscible in varying degrees, depending on the oil.—C L M BROWN *Pharm J*, 134 (1935), 794

(W B B)

Homeopathic Pharmacy—Regarding the Progress of A review which includes a comparative discussion of some of the methods employed. The original references are given.—W PEYER *Pharm Zentralh*, 76 (1935), 407

(E V S)

Hydrogen Peroxide Solution—Stability of Experiments show that the distilled water used in making the dilute solution of hydrogen peroxide should not be prepared in metallic apparatus. Hydrogen peroxide solutions prepared with such distilled water deteriorate rapidly. The distilled water required in the preparation should be made by use of glass apparatus. The kind of glass used in preserving the solution has very little influence on the stability.—P HORKHEIMER *Pharm Ztg*, 80 (1935), 507

(G E C)

Solutions—Sterile, Preparation of II A complete investigation of the Tyndallization process for preparing sterile solutions has been made and the results show that the principles underlying the process are seriously at fault. It is suggested that the Tyndallization process be considerably modified if it is to be retained as an official process. The germicidal action of some common medicaments on *S aureus* has been investigated and it is evident that many medicaments used in the preparation of solutions for parenteral injections possess some germicidal activity at atmospheric temperatures. An investigation of the effect of some common preservatives on *S aureus* has been made. Merthiolate is shown to be the most powerful germicide, a solution 1-100,000 being sufficient to kill the organism within thirty minutes.—H DAVIS *Pharm J*, 134 (1935), 788

(W B B)

Sterilization—Remarks on the Swiss Phar V Chapter on The Swiss Phar V specifies under the various solutions for injection the method of sterilizing the filled ampuls. However, while requiring the ampuls to be sterile before filling, it does not specify the method. No sterilization is required for ampuls of adrenaline hydrochloride solution.—J B L *Schweiz Apoth Ztg*, 73 (1935), 474

(M F W D)

Sterilization in the Swiss Phar V—Note on an Article on The article is comment upon one appearing earlier in the journal and points out a misinterpretation of the pharmacopœial directions. The Swiss Phar V makes a provision for the sterilization of porcelain and glass apparatus in general, under which ampuls are expected to fall. The neglect to specify sterilization for ampuls of solution of adrenaline hydrochloride is not important, since the solution is directed to be prepared under aseptic conditions and, as has been proven, is sterile.—J THOMANN *Schweiz Apoth Ztg*, 73 (1935), 534

(M F W D)

Sterilization Methods in Pharmaceutical Instruction and Operations—Physiological-Chemical Investigations and A review of sterilization methods of the Swiss Phar, the work of

Konrich with regard to killing of organisms with heat under pressure, that of Eschenbrenner concerning the use of the esters of *p* hydroxybenzoic acid ultrafiltration and Katadyn methods. A table gives the most satisfactory of the Swiss methods for the sterilization of 64 substances and their preparations—W KERN *Apoth Ztg*, 50 (1935), 916-921 (H M B)

Tablet Granules—Method for the Preparation of A granulation technique is described which is stated to yield superior granules for tableting. This depends on shaking rather than pressing the dampened clumps through a coarse sieve. Working directions for the preparation of *Tabletæ Bromisovalæ* are cited as an example. The method is described in greater detail in *Farm Tidende*, 45 (1935), 201. The mean error of distribution of the active principle in a batch of tablets is found to be less than that of tablets made by the press granulation method—K NIELSEN *Dansk Tidsskr Farm*, 9 (1935), 174 (C S L)

Tablets—Hints and Formulæ for Making, on a Small Scale The chief troubles experienced in the preparation of compressed tablets are 'capping,' 'sticking' and 'picking.' Capping is the term applied when the upper surface of the tablet splits off. The cause is usually that of excess powder in the granulation and may sometimes necessitate regranulation. Picking is the adherence of granules to the face of the punch and occurs from a granulation which is not quite dry, or from a scratched punch. The top punch is more usually affected, and the face should be smoothed with a portion of well-used, fine emery cloth and a trace of oil. Sticking is the effect produced when the bottom punch binds in the die, and may be caused by a slightly damp granulation or excess of powder. This sometimes is caused by substances such as calcium lactate, and may be overcome by using 4% of talc as a lubricant and placing one or two drops of liquid paraffin in the die, working the machine for a minute and removing excess of grease before compression. The degree of depression will vary with different types of tablets. Tablets such as potassium chlorate, soda-mint and formamin which are required to be dissolved in the mouth are usually compressed as hard as possible. Precautions must be taken with granulations of deliquescent or hygroscopic ingredients, such as thyroid, and there should be no delay between drying and compression. In regard to shape and size of the tablet, the thickness should be at least $\frac{1}{2}$ of the diameter. Formulæ are given for the manufacturing of the following tablets: aspirin, phenacetin and caffeine, saccharin, soda-mint, calcium lactate and aloes, nux vomica and belladonna—H DAVIS and F H GILLET *Australasian J Pharm*, 16 (1935) 380 (T G W)

Tinctures of B P C 1934—Alcohol Content and Specific Gravities of In the B P C 1934, limits are given for the alcoholic content of tinctures. As these limits may be used as legal standards it is desirable that they should be in accordance with samples prepared on a manufacturing scale. Figures which are recorded in a table show that the alcoholic content of the majority of the tinctures is well within the limits allowed by the B P C, and in most cases approaches the higher limit. Specific gravities of these tinctures are also recorded in the table—C T BENNETT and F C L BATEMAN *Pharm J* 135 (1935) 796 (W B B)

Wax-Paraffin Ampuls—Use of, for Silver Nitrate Solution Used in Prevention of Ophthalmia Neomatorum The ampul is lined with paraffin by dipping the spindles in a mixture containing 71% beeswax, 8% paraffin oil and 21% of a 56° C melting point paraffin. Silver nitrate in this paraffin lined ampul will probably retain the characteristics of a fresh solution in the new ampuls for from 10 to 12 times as long at the relatively high temperature of 37.5° C as does the silver nitrate solution in the old type of ampul and will be distributed with an expiration date of 1 year, instead of the present 6 months' dating—W E BUNNEY *Am J Pub Health*, 25 (1935), 813 (A H B)

Zephriol-Bayer—Use of, in Pharmaceutical Practice Zephriol is an aqueous solution of a mixed high molecular alkyl dimethylbenzyl ammonium chloride. Several investigations were carried out to determine the usefulness of Zephriol pharmaceutically. Immersion in a 1% aqueous solution sterilized spore-free apparatus such as filter plates, etc., on standing with them for one hour, however, longer periods of immersion rendered the filter plate hard and brittle. More concentrated solutions produce this result more rapidly. Spore bearing material resisted a 1% solution at room temperature but on heating to 100° C for 30 minutes was rendered sterile. Immersion for 15 to 30 minutes in a 10% solution of Zephriol containing 1% of soda to prevent rusting, was sufficient to sterilize surgical instruments. The 10% solution had a greater sterilizing capacity than Sapo formaldehydratus of the Swiss Phar V—J THOMANN *Pharm Acta Helv*, 10 (1935) 117 (M F W D)

PHARMACOPŒIAS AND FORMULARIES

Codex and Public Pharmacy The public pharmacist may rightly claim some credit for the acceptance of the Codex as an authoritative work of reference, for he was one of the first to adopt the Codex standards in contracts for unofficial preparations. In the formulary section the use of 'g' for gram is a serious mistake, and the pharmacopœial recommendation of 'G' received a warm welcome from all pharmacists who have to dispense in both systems of weights. The emulsion of petrolatum and agar is a good example of a vicious circle. The medical man who accepts the Codex as a standard wants to prescribe it because it is in the Codex, while the Codex apparently includes it because doctors ask for a formula combining the effects of agar and paraffin.—W A KNIGHT *Pharm J* 134 (1935) 88 (W B B)

Dutch Pharmacopœias This splendid article is of considerable historical interest. The national pharmacopœias of the world are listed in chronological order as to their appearance and dates of the latest edition of each are given. The history of the various Dutch pharmacopœias is then discussed. The first official pharmacopœia to appear in Holland was the Pharmacopœia Amstelodamensis appearing in Amsterdam in 1636. Other important municipal pharmacopœias are Pharmacopœia Leidensis 1638, Pharmacopœia Ultrajectina 1656, Pharmacopœia Hagensis 1659, Pharmacopœia Leovardiensis 1687, Pharmacopœia Harlemensis 1693, Pharmacopœia Dordracena 1709, Pharmacopœia Roterodamensis 1709, Pharmacopœia Almeriana 1723 and Pharmacopœia Groningana 1729. Many of the formulas appearing in the old Dutch pharmacopœias are discussed both comparatively and in connection with the period at which they appeared. The article concludes with a table of 114 pharmacopœias published in Holland between the Amsterdam Pharmacopœia of 1636 and the Pharmacopœia Batava of 1805.—W F DAEMS *Pharm Weekblad*, 72 (1935) 1078 (E H W)

Liver Extracts The proposed U S P monograph on liver extracts, Circular 465 U S P Revision Committee, was considered and the unanimous opinion arrived at that liver extract should not be included in U S P XI until such time as a satisfactory animal or chemical assay is available.—Subcommittee on Digestive Ferments and Glandular Products.—Am Drug Manufacturers Assoc, Proceedings (1935) 197, through *Squibb Abstract Bull*, 8 (1935), A-1376

Swiss Pharmacopœia—Remarks on the New The author makes some comments on various preparations and tests of the Swiss Phar V. The points commented upon are: the definition of unsaponifiable matter; purity test for salicylic acid; identity test for tartaric acid; identity test under agar; test under solution of aluminum aceto tartaric acid; identity reaction of antipyrine; lack of assay for orange flower water; identity test for codeine phosphate; identity test under compression of iodine; assay of solution of formaldehyde; identity test for mercuric oxycyanide; requirements under white precipitate of mercury; the title of solution of potassium arsenite; detection of benzonaphthol and the assay of rhubarb.—L ROSENTHALER *Schweiz Apoth Ztg*, 73 (1935), 469 (M F W D)

Surgical Dressings—Criticisms of Some Codex Standards for In the new Codex general instruction regarding sterilization has been included under unmedicated gauze (and under the ribbon gauze) for some reason and not in the other monographs. This instruction could well be dispensed with, as most dressings can be sterilized by the same means. Similarly the sentence 'Aseptic absorbent gauze is absorbent gauze in a sterile condition' is a curious inclusion, the exact purpose of which is not clear. If the monograph is intended to describe sterile in addition to the ordinary gauze the phrasing requires separation as formerly. A fuller description of a container which could maintain the sterile condition would be illuminating. Euflavine, mercuric chloride and carbolic gauzes are worthy of corresponding definite assay processes and standards in common with the other medicated dressings. Some attempt has been made to describe the *Sterilization of Dressings* in a very sketchy manner. The article also briefly comments on the following topics: *Battista Cellulosum Ligni Charta Oleata, Corchorus, Emplastra, Gossypia, Jaconetum Lana, Ligamenta Lintea, Stupa, Tela*.—J BAIN *Pharm J* 134 (1935) 87 (W B B)

NON OFFICIAL FORMULÆ

Adepdelen (A Erdmann, Berlin-Schöneberg) is a scouring and degreasing agent prepared from urea borate, sodium sulphate, magnesium sulphate and other corrigents.—*Pharm Zentralh*, 76 (1935) 553 (E V S)

Brushless Shaving Creams A good cream of this type must (1) spread easily (2) soften the beard, (3) remain soft on the skin and in the tube, (4) promote sliding of the razor on the skin (5) be removed easily by water from the razor and the face (6) not irritate the skin and (7) be pleasantly perfumed. Essentially these products are modified day creams of the oil in water types of emulsions and small amounts of superfatty bodies. Stearate creams are preferred in which stearin is saponified by potassium hydroxide, potash ammonia or triethanolamine or their mixtures up to 20-40%. Less than 14% stearin produces a cream without body, over 20% one with too much body. The purposes of the various ingredients are discussed. The following formulas are offered: (1) Cefatin 20% stearin 5% glycerin 5% water 70 parts, liquid petrolatum 1 part. For strong beards the addition of 0.5% triethanolamine worked in while hot is suggested. (2) Stearic acid 17% glycerin 10% potassium hydroxide (or potassium hydroxide solution 50° B 2%) mineral oil 2.5% water 69.5%. The quality of the product may be varied by the addition of traces or small amounts of lanolin, cocoa-butter, magnesium stearate, zinc stearate, zinc oxide, talc, colloid kaolin suspension. (3) (an American product) stearic acid 20% cetyl alcohol 1.1% mineral oil 2% ethylene glycol (or preferably diglycol, triglycol or carbitol) 1.5% triethanolamine 1.65% borax 1.85% water 71.4% perfume 0.5%. Melt the fats and add with stirring to the boiling mixture of other ingredients. After cooling to 40° C add the glycol and the perfume, (4) stearic acid 20% glycerin 5% white mineral oil 5% ammonia (26%) 2.2% zinc oxide 1.5% phenol 0.05% perfume 0.75% and remainder water.—JOSEF AUGUSTIN *Reichstoff Ind Kosmetik*, 10 (1935) 116-118 (H M B)

Burns—Preparations for (1) Picric acid 1%, boric acid 2% lanolin, absorption base 34%, cetyl alcohol 3% spermaceti 2% water 58%. Dissolve the acids in water, melt the other ingredients at 40° C. Heat the water solution to this temperature and carefully mix in small amounts. (2) Tannic acid 4.8% lanolin hydrous 27%, thymol 0.2% cod liver oil 20% short fibre soft amber petrolatum 47% eucalyptus oil 1%. Dissolve the thymol in the eucalyptus oil, add a small amount of the cod liver oil and rub up the acid in this mixture. Melt the lanolin and petrolatum and mix until it thickens, then stir in the remainder of the cod liver oil and finally the thymol solution. (3) Tannic acid 5% oil of cade 5% cod liver oil 15% lanolin absorption base 40% water 34.8% phenol 0.2%. Dissolve the acid in water and warm to 45° C. Warm the base to 40° C, add phenol and the oils. Slowly stir in the tannic acid solution. (4) Linseed oil, refined 45%, cottonseed oil refined 42% cod liver oil 10% phenol 1% camphor 2%. Mix the last three ingredients together and add to a mixture of the first two. (5) *An emulsified lotion*: lecithin 1% cetyl alcohol 2% cholesterol 1% triethanolamine stearate 7% methyl para hydroxybenzoate 0.5% mineral oil 18.5% water 70%. Heat the oil and melt in the lecithin, cetyl alcohol and cholesterol. Put the stearate in water and heat with stirring until melted, pour in the oil solution slowly and stir constantly for an hour. (6) Tannic acid 5% glycerin 5% water 90%. Dissolve the acid in the water and add the glycerin. (7) Picric acid 2% alcohol 10% water 88%. Dissolve the acid in the alcohol and add the solution to the water.—ANON *Drug and Cosmetic Ind.*, 37 (1935) 45-46 (H M B)

Chamomile Cosmetics Formulas for 18 preparations are offered in which the substance is used as the extract, oil, powder or water.—ANON *Drug and Cosmetic Ind.* 37 (1935) 187-190 (H M B)

Colloid Mills and Cosmetics Factors affecting the use of these mills in making creams are (1) the speed of the mill and the extent to which air bubbles are eliminated and (2) the rate at which the emulsion formed is passed through the mill. Six mills were studied and in a table various characteristics and their applicability in the manufacture of creams, emulsions, mucilages etc. are discussed.—THORPE W. DEAKERS *Drug and Cosmetic Ind.* 37 (1935) 41-43 (H M B)

Creams—Claims for The following table is offered

Type of Product	Described as	Advertising Claims	Adapted to
1 Cleansing Cream	Liquefying Cream Cold Cream	Cleanses penetrates, liquefies instantly mild stimulates softens refines the skin	All types of skin esp cially oily skins

2	Lubricating Cream	Nourishing Cream, Tissue Cream, Tissue Builder, Skin Food, Nutrient Cream, Emollient Cream, Wrinkle Cream, Facial Cream, Massage Cream, Night Cream, Gland Cream	Nourishes, beautifies, softens, whitens restores relaxed tissues, prevents crepey throat, banishes lines, tones muscles, replaces natural oils, penetrates	Normal, dry, older and wrinkled skins
3	Foundation Cream (Vanishing Cream)	Finishing Cream, Make up foundation	Finishes, protects from dust and wind, acts as a powder base	All but very young skins
4	Stimulating Cream	Circulation Cream, Circulation Ointment	Refines stimulates brings natural color	Oily sallow lustre less coarse and older skins
5	Eye Cream	Eye Wrinkle Cream, Eye Wrinkle Paste, Eye Tissue Cream	Prevents crow's feet wrinkles, rough wrinkles	Skins with incipient wrinkles and crow's feet thin and dry skins
6	Hand Cream		Feeds skin, makes it soft white, protects from chapping and roughness soothes penetrates dries rapidly, non sticky	Especially for dry, rough or red hands, foot massage

Primary Composition

Typical Formula

1	Water in oil emulsion, low viscosity oil low melting emulsion containing oil wax water	Beeswax 15 Petrolatum 10 Mineral Oil 54 Water 20 3 Borax 0 7	
2	Water in oil emulsion vegetable oils, cholesterol, lecithin cetyl alcohols, etc	Beeswax 15 Cetyl alcohol 5 Vegetable Oil 20 Mineral Oil 32 Cholesterol 2 Water 25 Borax 1 Preservative	
3	Oil in water emulsion, stearic acid, alkali glycerin water cetyl alcohol butyl stearate cocoa butter, oil	Stearic Acid 24 Potassium Hydroxide 1 Glycerin 5 Butyl stearate 6 Water 64	
4	Oil in water, water-in-oil emulsions with mineral or vegetable astringents	Paraffine 5 Lanolin 2 Mineral Oil 15	Cetyl alcohol 4 Alcohol 6-Water 65 Tannic acid 3
5	Extra effective lubricating cream with higher proportion vegetable oils etc	Beeswax 15 Cetyl alcohol 10 Vegetable oil 45 Cholesterol 4	Water 25 Borax 1 Preservative

6 Like foundation cream with skin softeners, also mucilages	Stearic acid	18 8	Glycerin	12
	Triethanolamine	1 8	Alcohol	6 5
	Cholesterin	2	Water	59 7
	<i>Drug and Cosmetic Ind</i> 37 (1935), 34-35 (H M B)			

Depilatory Developments An account of recent progress in the United Kingdom The use of the product of passing hydrogen sulphide into milk of lime is recommended—HENRY LEE-CHARLTON *Am Perfumer* 30 (1935), 278-279, 310 (G W F)

Face Powder—Types of The following table is offered—see pages 329 and 330

Hormone and Vitamin Cosmetic Creams A brief discussion of the efficiency of cold creams as vehicles for the application or administration of hormones and vitamins—R M GATTFOSSE *Parfumerie Moderne*, 29 (1935), 141-143 (A P C)

Liquid Shampoo A shampoo should cleanse the hair thoroughly but instead of leaving the hair in a dry brittle condition it should impart lustre without greasiness This is accomplished by removing the natural oil and depositing oils from the shampoo in minute traces on the hair shafts which makes the hair soft and lustrous These preparations are essentially solutions of potassium soap to which alcohol and glycerin are sometimes added The soap is made by the cold or hot method with preference to the former A typical soap formula is given Coconut oil 15%, palm oil 5, caustic potash (90%) 3, caustic soda (90%) 1, alcohol 7, water 69 Dissolve the alkalis in $\frac{1}{2}$ the water using stoneware Liquefy the oils at 120° F vessel glass lined or stainless steel Agitate slowly and run in the alkali add alcohol and mix for $\frac{1}{2}$ hour, allow to stand over night and stir in the remainder of the water, age and filter If made by the hot process follow the same procedure except after the addition of the alkali, the temperature is increased and maintained for $\frac{1}{2}$ hour or until saponification is complete The following formula yields a clear amber product which does not become turbid upon standing Coconut oil (best Cochinchina grade) 14% caustic potash (90%) 6, caustic soda 0.5 oleic acid 10, glycerin 12, perfume oil 0.5 water 57 Dissolve the potash in $\frac{1}{4}$ of the water using a steel kettle Melt the coconut oil, and at 130° F stir in the potash solution with constant mixing Increase the temperature to 180° C and stir for an hour and allow to stand over night, then bring to a boil $\frac{1}{2}$ the remaining water and the glycerin Add the coconut soap in small portions with constant slow stirring until dissolved, heat the remaining water to boiling add the sodium hydroxide and stir this solution into the soap, heat the oleic acid to 160° F and add to the soap solution with agitation Mix until tests show complete saponification The finished soap may be run through a homogenizer or colloid mill and chilled to 32° F producing a product which will not become cloudy after bottling *Olive Oil Shampoo*—Olive oil 8%, palm oil 4 coconut oil (Cochinchina) 8 caustic potash (90%) 5 alcohol 8, water 58 glycerin 6 oleic acid 2.5 perfume 0.5 Warm the oils to 120° F and dissolve the potash in $\frac{1}{4}$ the water and stir into the oils heat the mixture to 180° stirring constantly stir in the acid cool to 110°, stir in the alcohol and perfume, allow to stand over night and add the remainder of the water mixed with the glycerin Age or chill and filter Equipment necessary for this type of manufacture is mentioned—ANON *Drug and Cosmetic Ind* 37 (1935) 39-40 43-44

(H M B)

Shaving Soap The following formulas and procedures for modern shaving soaps are offered (1) *Shaving Cream*—Triple pressed stearic acid 26%, coconut oil (Cochinchina) 8% cetyl alcohol 5%, sodium hydroxide (85%) 0.75% potassium hydroxide (85%) 9% glycerin 9% boric acid 1%, water 40.75%, oil of lavender 0.5% Weigh out the stearic acid and divide into 2 equal parts put one part into a steam-jacketed kettle add the coconut oil and heat to 180° F, put the other portion of the acid and the alcohol into another kettle and melt Dissolve the boric acid in water and set aside dissolve the alkalis in the remainder of the water To the stearic acid and coconut oil melts add the alkalis slowly mixing and maintaining the temperature for 20 minutes, add the glycerin and boric acid solution mix for 10 minutes, add the remainder of the stearic acid and cetyl alcohol slowly, remove heat and mix for one hour add the perfume oil age for one month with occasional stirring By reducing the amount of cetyl alcohol, anhydrous lanolin lecithin or cholesterol may be added The final product dissolved in warm alcohol should not show more than a pale pink to phenolphthalein (2) Beef tallow 6%, triple pressed stearic acid 25%, coconut oil (Cochinchina) 10% lanolin 2% cholesterol 0.25% glycerin 7%, boric acid

PHARMACY

Nov 1935

Product	Purpose	Properties	Primary Composition	Formulas		
				Me-	Light	Heavy
1 Face Powder	Cosmetic to improve texture color and finish of the skin. Cover minor imperfections.	Color, to match and flatter skin is of paramount importance. Perfume must be attractive. Should have covering power, be adherent, apply smoothly, hold odor, not clog pores.	May consist wholly or in part of powder bases. Pigments give covering power, slip given by talc, powder bases, etc. Metallic soaps increase adhesion, puffed chalk acts as binder and absorber of perfume. Materials must be finely dispersed and color well mixed. Light, heavy and medium refer to covering power and type of skin.	Zinc oxide Titanium Oxide Kaolin Zinc stearate Talc Magnesium stearate Precipitated chalk Mag carbonate Perfume Color 9 5	22 00 4 00 20 00 6 00 65 00 3 00 6 00 6 00 1 00	3 00 20 00 4 00 6 00 66 00 6 00 6 00 1 00 1 00
2 Compact Powder	Same as Face Powder	Color, perfume covering power, adhesion, slip are important. Cake should be smooth, reasonably hard, non-crumbing. Should rub off onto puff smoothly and easily.	Suitable face powder formula with addition of binder. May be molded or pressed. Finished cake should be smooth with satin finish. Gum or resin (1%) in water as binder.	Talc Kaolin Starch Zinc oxide Liquid binder Titanium oxide Cetyl alcohol Color and perfume	37 00 25 00 33 00 5 00 10 00 7 00 1 00	54 00 26 00 29 00 9 00 10 00 7 00

(Continued from page 329)

Product	Purpose	Properties	Primary Composition	Formulas		
				Light	Medium	Heavy
3 Cream Powder	Same as Face Powder	Color, perfume covering power Foundation cream should be non greasy and leave no shine, should leave a thin film of fine powder which adheres well Should benefit the skin	Covering agt (white pigment) mixed with colored pigment is dispersed in foundation cream which is non greasy, leaving smooth finish on the skin creams may be made for dry normal, oily skins Emulsion is liquid cream with finely divided pigment, formulas are for dry, oily skin and emulsion, respectively	Zinc oxide 3	5 0	3 0
				Titanium oxide 3		
				Oil in-water absorption base 10		
				Stearic acid 3	22 8	2 0
				Potassium hydroxide 0 1	0 9	0 2
				Glycerin 4	10 0	3 0
				Spermaceti 5		3 0
				Water 71	9 61	3 82
				Pigment color and perfume		
				Zinc oxide 6	5	8
4 Liquid Powder	Same as Face Powder	Color, perfume covering power Emulsion (thin cream) or suspension, should suspend easily after settling	Suspension type contains about 80% water glycerin (emollient), alcohol (astringent) and pigment Color must be non bleeding and should be mixed with pigment Grind fine (colloid mill) to facilitate suspension	Titanium oxide		
				Precipitated chalk 8	8 6	
				Kaolin 3	5 5	
				Zinc stearate 2		
				Glycerin 3	3 5	
				Alcohol 5		
				Water 73	79	76
				Color and perfume		

1.5%, sodium hydroxide (85%) 8%, potassium hydroxide (85%) 0.75%, water 30%, menthol 0.1%, perfume 0.4% The procedure is the same as in (1), the lanolin and cholesterol being melted with the second portion of the stearic acid and the menthol added with the perfume — (H M B)

ANON *Drug and Cosmetic Ind*, 37 (1935), 181-182

Tooth Paste The following parts of a tooth paste are discussed (1) polishing agents as chalk tricalcium phosphate calcium sulphate, magnesium and magnesium carbonate, (2) vehicles including glycerin, alcohol and water, (3) binders to prevent separation and give colloidal protection such as tragacanth, starch as the glycerite Irish Moss as the mucilage, acacia and bentonite Tragacanth is to be preferred and is prepared (a) glycerite of the gum (10%), glycerin 78% and water 12% Heat until clear on the water bath, or (b) by the cold method mixing the gum with glycerin and allowing to stand and (c) allowing the gum to swell with water and stirring until a smooth paste is obtained, (4) 1% mineral oil is added, (5) sweeteners such as saccharine, (6) potassium chlorate (10% or more) sodium bicarbonate camphor, silica gel, cuttlefish bone kaolin, talc, etc., are sometimes used (7) color of the paste should be creamy white, erythrosine is used to give a pink paste and (8) flavors such as the oils of peppermint, spearmint, cassia, cloves, pimenta, anise cardamom and eucalyptus menthol and thymol Necessary equipment for preparing is a mixer, sifter and ointment mill The following formulas are offered (1) precipitated chalk 40%, tricalcium phosphate 6%, white soap powder 2% mucilage of tragacanth 5%, soluble saccharine 0.1%, mineral oil 1% glycerin 15%, water 30.4% and flavor 0.5% Soak the gum in $\frac{1}{2}$ of the water and place in a mixer with the remainder of the water and glycerin Stir and add the sifted powders containing the saccharine and add the flavor and mineral oil Mix until smooth, mill through an ointment mill, allow to stand and then tube in the usual way (2) Precipitated chalk 42%, neutral soap powder 10% benzoic acid 1% saccharine 1%, glycerin 25%, alcohol (specially denatured) 20% and flavor 1% Dissolve the saccharine and flavor in $\frac{1}{2}$ of the alcohol and the benzoic acid in the rest of the alcohol In the mixing machine place the glycerin and add the alcohol solution of the acid passing through a strainer Now add the other alcohol solution agitate well, add $\frac{1}{2}$ of the chalk and mix add the soap, mix and then add the rest of the chalk Mix and mill (3) Acid Dental Cream tricalcium phosphate 23%, calcium sulphate 35% glycerin 25% water 10%, glycerite of tragacanth 4% mineral oil 1%, acid 0.1%, sodium lauryl sulfonate 0.5% and flavor 1.4% Prepare the glycerite by the heat method, place with the glycerin in a mixer and mix, add the calcium salts mix add the sodium salt and the flavor containing the saccharine then the mineral oil All powders should be free from carbonates (4) Milk of Magnesia tooth paste Milk of magnesia 24%, precipitated chalk 32%, white powdered soap 2%, glycerite of tragacanth 10% glycerin 10%, water 20%, mineral oil 1% saccharine (soluble) 0.1% and flavor 0.9% Mix the glycerite, glycerin and water, add $\frac{1}{2}$ of the chalk mix add the milk, mix then the soap and the remainder of the chalk and the flavor containing the saccharine, mix well and mill Time can be saved in making the milk of magnesia by using pulverized magnesium oxide add water, allow to stand and pass through a colloid mill Creams may be tested by placing in freezing mixtures, in an oven at 100-110° F in a window After three weeks the preparation should remain creamy, uniform and soft — J W WILLIAMS *Drug and Cosmetic Ind* 37 (1935) 31-32, 44 (H M B)

DISPENSING

Fluidextract of Ergot in a Mixture Considerable doubt exists as to the best means of dispensing Liquid Extract of Ergot of the B. P., 1932 and as to the value of the preparation when dispensed in the form of a mixture In January 1933, Dr J H Burn made the statement that 'Extractum Ergotæ Liquidum must be given alone and it cannot be included in general prescriptions if the desired therapeutic result is to be obtained' Dr B L Stanton submitted the following formula for trial as a Quinine, Ergot and Strychnine Mixture Ext Ergot Liq B. P. '32 M xv Quinini Dihydrochlor gr v Tr Nuc Vom M xv, Tr Aurant M xv Glycerin, ad Z ii The object of the present work was to determine whether this mixture would keep for a sufficient length of time without loss of activity due to alteration of the ergotoxine, for the mixture to be of practical value A period of fourteen days was taken as a reasonable length of time, as normally such a mixture would be used in that time A sample of mixture made according to Dr Stanton's formula was prepared and after storage under ordinary conditions of light and temperature has remained clear after 15 months A sample of Liquid Extract of Ergot was obtained and assayed

by the B P method From the extract a sample of Quinine, Ergot and Strychnine Mixture was prepared according to the above formula and assayed by the same method as the extract After 14 days, the Liquid Extract of Ergot and the mixture (without quinine) were again assayed A loss of 12.9% of the original amount of ergotoxine present had occurred in both cases The mixture suffered no greater loss in alkaloidal content than the Liquid Extract of Ergot—E. E. NIE *Australasian J Pharm*, 16 (1935), 385 (T G W)

Medicines for Injection—Physiological and Physico-Chemical Considerations in the Preparation of A lecture, concerned chiefly with the question to what degree the pharmacist can and should take into account physicochemical and physiological considerations in preparing medicines which are to be injected In particular the question of making the hydrogen ion concentration of the preparation approach that of the blood is discussed The question of isotonicity and that of sterility are also considered A signature label is proposed for use by the pharmacist who attempts to employ these considerations In the preparation of this medicine injection account has been taken of p_H —Osmotic pressure—Sterility in so far as the properties of the preparation permit"—S. A. SCHOU *Arch Pharm og Chem*, 42 (1935), 401 (C S L)

Solution of Methenamine and Ammonium Chloride A formula is cited for preparation of a solution recommended by Prof. E. Warburg for acidifying the urine, called *Mixt. Methenaminum ammonii chloridi* This consists of ammonium chloride 80 Gm, methenamine, 12 Gm, *Tinctura Aurantii dulcis* 10 Gm and distilled water 300 Gm—ANON *Arch Pharm og Chem*, 42 (1935), 450 (C S L)

PHARMACEUTICAL HISTORY

Apothecaries in Landau (Pfalz)—History of the Historical—HAGEN *Apoth Ztg*, 50 (1935), 789-790 (H M B)

Apothecaries of the City of Königsberg—History of the The Adler Apothecary A historical account of an apothecary dating from 1739-1831 C. f. *Apoth Ztg*, 44 (1929), No. 101, (1931) Nos. 44-47, (1934), Nos. 16, 71—G. E. DANN *Apoth Ztg*, 50 (1935), 407-410 (H M B)

"Apothecary of the Golden Eagle" in Landburg on the Warther—History of the G. WARTENBERG *Apoth Ztg*, 50 (1935), 927-929 (H M B)

Badianus Manuscript An Aztec Pharmacopœia Only one Aztec written medical text has come down to us It is known as the Badianus Manuscript and is the earliest pharmacopœia written on this side of the Atlantic The original is in the Vatican Library where its identity is obscured by the title *Codex Barberini Latin 244* Its precise title is "A book of Indian Medical Herbs composed by a certain Indian physician of the College of Santa Cruz who is not theoretically learned, but is taught only by experience In the year of our Lord Saviour 1552" The book was discovered about six years ago by Thorndike and Clark Clark brought back a photographic copy From photostats of this the present study was made It is the work of two Indians, the original text being in Aztec Badianus made the Latin translation Ailments are grouped according to the region in the body, beginning with the head There are remedies for mange, scabs, falling hair, cataract, cold in the head, quinsy, fever, fatigue and many others Knowledge of medicinal plants and treatment of diseases was considered equal to that of Europe The Franciscan friars included Mexican medicine in the curriculum of the College of Santa Cruz The spreading of Aztec medical knowledge was by the writings of several physicians as well as by travelers and merchants—EMILY W. EMMART *J Am Pharm Assoc*, 24 (1935), 771 (Z M C)

Cosmetics—History of, in Recent Times A continuation dealing with the development of waters, toilet vinegars and pomades—A. HAUENSTEIN *Reichstoff-Ind Kosmetik*, 10 (1935), 124-127 (H M B)

Digitalis—Early History of Since 1775, when Dr. Withering cured Dr. Crawley, the Dean of Brazen Nose College of Oxford, suffering from a dropsical condition, with a preparation of foxglove, many practitioners and investigators have worked with the drug Digitalis, now a recognized medicine for over one hundred and seventy years, has grown in stature as the years went by until it has now attained recognition as the greatest of all heart healers—EDWARD PODOLSKI *Am J Pharm*, 107 (1935), 352 (R R Γ)

PHARMACEUTICAL ABSTRACTS

EDITOR A G DuMEZ, 32 S Greene Street, Baltimore, Maryland

ABSTRACTORS

WILLIAM B BAKER
GERSTON BRUCH
ARTHUR H BRYAN
HENRY M BURLAGE
ALBERT H CLARE
ZADA M COOPER
GUSTAV E C WALINA
AMELIA DeDOMINICIS
MELVIN F W DUNKER
GEORGE W FIERO
PERRY A FOOTE
RALPH R FORAN
SAMUEL W GOLDSTEIN
H B HAAG
G W HARGREAVES
WILLIAM H HUNT
CASIMER T ICHNIOWSKI

ROLAND E KREMERS
CLIFFORD S LEONARD
L LAVAN MANCHEY
ARTHUR E MEYER
A PAPINEAU-COUTURE
W ARTHUR PURDUM
HARRY ROSEN
A S SCHWARTZMAN
EMANUEL V SHULMAN
EDGAR B STARKEY
MARVIN R THOMPSON
E G VANDEN BOSCHE
GLENN S WEILAND
ANNA E WHITE
ELMER H WIRTH
THOMAS G WRIGHT
MAX M ZERVITZ

CONTENTS

Pharmacy

Pharmaceutical Education	334
Pharmaceutical Legislation	334
Miscellaneous	335

Pharmacology, Toxicology and Therapeutics

Pharmacology	336
Toxicology	340
Therapeutics	343

New Remedies

Synthetics	354
Specialties	355

Index	367
-------	-----

PHARMACEUTICAL EDUCATION

Biology for Pharmaceutical Students A discourse on the vocational use and foundations of a training in biology for pharmaceutical students—F J DYER *Pharm J*, 135 (1935), 185

(W B B)

Pharmacist—Education of the The reform in the education of the pharmacist in Hungary has not only been along pharmaceutical lines but also along cultural, sanitary and other lines The author has compiled the requirements of 28 countries In 20 of the 28, the education of the pharmacist begins with a university course, which method seems more reasonable than the systems in which apprenticeship in a pharmacy is the first step Of the countries studied 9 require 6 semesters of school work, 11 require 8 4 require 9 or 10, 1 requires 5 and only 3 require 4 semesters In 8 countries the pharmaceutical faculties are of university standing and in 4 they are of high school standing The second table shows the individual subjects along with the required number of credit hours for 17 countries The third table shows the subjects and the number of credit hours required in the course in pharmacy in Hungary The pharmacist should be equipped along several lines so that he may be of service to practicing physicians, and in small towns he must also be acquainted with farming necessities of a chemical nature such as fertilizers and the like—S MOZSONYI *J Hungarian Pharm Assoc*, through *Pharm Presse*, 40 (1935), 309

(M F W D)

PHARMACEUTICAL LEGISLATION

Drug Code—Brief History of This history is traced from the authorization of a Committee on the Retail Drug Code by the National Association of Retail Druggists, following the enactment of the National Industrial Recovery Act down to time of the decision of the Supreme Court in the Schechter case At the final meeting of the National Code Authority, June 8, 1935, it was decided to place all records in the keeping of the secretary for one year and then to turn them over to the AMERICAN INSTITUTE OF PHARMACY for such historical use as can be made of them—E F KELLY *J Am Pharm Assoc*, 24 (1935), 767

(Z M C)

Pharmacopœia of the United States and the Federal Food and Drugs Act Attention is directed to the primary purpose of a pharmacopœia and the origin and method of revision of the U S P is discussed Reasons why the Pharmacopœia should not be deleted from the Federal Food and Drugs Act are explained What is meant by a 'variation clause' is explained and the question whether reference to the U S P in the Federal Food and Drugs Act may be coupled with the variation clause is discussed at some length That the variation clause is necessary to permit improvement in pharmaceutical substances is explained and also the relation of this clause to the delegation of legislative power In many cases titles employed to designate U S P substances are taken from the English Language and such names cannot be copyrighted The primary purpose of a food and drugs act is to prevent fraud The author summarized his arguments as justifying the following conclusions "1 That a Federal Food and Drugs Act as represented by the Copeland Bill applies exclusively to foods and drugs while they are within the domain of interstate commerce By the use of no language can the Federal law be made to apply to commerce after it has lost its interstate character After once mingling with the goods of a particular state, only the laws of such state can fix the qualities which drugs must possess in order to permit their lawful distribution therein 2 That the definitions for drugs, and for adulterated and misbranded drugs as found in the Copeland Bill are such that without the addition of a proper variation clause, only such drugs as complied with U S P standards of strength, quality and purity could be lawfully transported in interstate commerce a condition which if it prevailed would prevent the shipment of hundreds of thousands of tons of drugs and chemicals commonly used in the arts and industries 3 That each new revision of the U S P presents numerous changes in the standards of strength, quality and purity of the drugs described in its monographs and also introduces new drugs and preparations which were not commonly used or even known when the preceding volume was issued If the law making body confers upon the revisers of the Pharmacopœia blanket authority to change the legal obligations of the citizen so as to render him liable to fine and imprisonment for acts which would have been innocent in law if the Pharmacopœia had not been revised, it would seem fairly evident that there has been an attempted delegation of law-making power On the other hand if the law permits the use of U S P titles which are parts of common English speech upon articles not of U S P standards, upon

condition merely that the label states the fact of such variation, then no new obligation is forced upon the producer when a new Pharmacopœia becomes official. Under any revision of the Pharmacopœia his legal liability remains the same, he will always have the option either of observing U S P standards or of stating upon the labels wherein his product differs from such standards.

4 That it is the common understanding among physicians and pharmacists and taught in all colleges of pharmacy, that the use of a U S P title without the addition of qualifying adjectives or other explanatory words, implies that the product to which it is attached complies with U S P standards of strength, quality and purity. Unless this be the rule, the primary purpose of the Pharmacopœia—to enforce uniformity in properties and potency—would be defeated.

5 That a proper variation clause is one which would require that when a U S P title is attached to a drug of other than U S P standards the qualifying words shall indicate clearly that the drug does not profess to comply with such official standards. The wording of the label should not be obscure or ambiguous, but such as to enable the reader to form an intelligent opinion as to the character of the product.

6 And finally, that the deletion of the variation clause from the Federal Food and Drugs Act would not close interstate commerce to the shipment of medicinal preparations of official drugs which did not comply with U S P standards. The producer would need only to give his product some attractive coined name and ship it as a proprietary specialty, thus setting his own standards, without let or hinderance from any authority."—J H BEAL *J Am Pharm Assoc* 24 (1935), 759 (Z M C)

Pharmacy in Denmark. A discussion of the changes taking place in pharmacy administration in Denmark.—W MATR *Pharm J*, 135 (1935), 254 (W B B)

Vitamin and Organotherapeutic Preparations, Standardized. The Question of Their Unrestricted Commerce in the Wholesale Pharmaceutical Trade. A lecture before the Nordiska Apothecaries and Pharmaceutical Meeting of 1935 in Stockholm discussing state regulation and control especially of vitamin preparations and gland preparations. Thyroid gland is not considered satisfactorily controlled by chemical means and the biological method of Krogh and Lindberg is recommended. It is noted however, that the biological methods are still in dispute and that probably the chemical method approved by the Permanent Standards Commission of the League of nations will remain more convenient to use. Vitamin A and D concentrates such as halibut liver oil, Calciferol, B vitamin preparations such as rice polishings extracts, yeast extracts and liver extracts are cited as examples of preparations needing biological control. The problem of cost to the state is considered.—J K GALDBAER *Arch Pharm og Chem* 42 (1935), 427, 441 (C S L)

MISCELLANEOUS

Pharmacist and the Podiatrist. The opportunities for pharmaceutical work in supplying the podiatrist or chiropodist are hardly touched. A considerable number of substances and formulas are listed. The classification indicates the scope. Dusting powders, emollients, massage preparations, laryolytics—preparations for softening of abnormal growths, escharotics, preparations used in the treatment of ring worm infections, hyperhidrosis and bromidrosis, skin stimulants.—W F AMBROZ *J Am Pharm Assoc*, 24 (1935), 774 (Z M C)

Professional Pharmacy and Chemical-Pharmaceutical Industry in the Soviet Union.—State of Impressions from a Tour. A detailed account of the impressions gained by a Swedish apothecary on a tour in the Soviet Union studying the organization of the professional apothecaries, service and the state of the chemical and pharmaceutical industry. Both the public apothecaries and the hospital dispensaries are considered, also the schools of pharmacy especially the Moscow Institute or College. There are in the Union 126 schools awarding the assistant's certificate and three 'high schools' or colleges of higher study. The Moscow Institute trains both apothecaries' assistants and physicians' assistants. The three year pharmacy course is open to students over 16 and under 35 years of age who have had at least seven years of lower school. After passing the assistant's examination three years of practice in an apothecary shop are required before the candidate may enter higher studies. At least two years of study for the higher degree are necessary. The subjects of curriculum are cited. The Moscow Institute has about 150 teachers and 1400 students. Descriptions of visits to Russian pharmaceutical industrial works are also of interest. At one works digitalis and adonis glucoside extraction, manufacture of chloroform, and synthesis of plasmochin, bromvalerylurea, diethylmalonylurea, sajodin, phenylcinchonic acid

PHARMACEUTICAL EDUCATION

Biology for Pharmaceutical Students A discourse on the vocational use and foundations of a training in biology for pharmaceutical students—F J DYER *Pharm J*, 135 (1935), 185

(W B B)

Pharmacist—Education of the The reform in the education of the pharmacist in Hungary has not only been along pharmaceutical lines but also along cultural sanitary and other lines The author has compiled the requirements of 28 countries In 20 of the 28, the education of the pharmacist begins with a university course, which method seems more reasonable than the systems in which apprenticeship in a pharmacy is the first step Of the countries studied, 9 require 6 semesters of school work, 11 require 8, 4 require 9 or 10, 1 requires 5 and only 3 require 4 semesters In 8 countries the pharmaceutical faculties are of university standing, and in 4 they are of high school standing The second table shows the individual subjects along with the required number of credit hours for 17 countries The third table shows the subjects and the number of credit hours required in the course in pharmacy in Hungary The pharmacist should be equipped along several lines so that he may be of service to practicing physicians and in small towns he must also be acquainted with farming necessities of a chemical nature such as fertilizers and the like—S MOZSONYI *J Hungarian Pharm Assoc*, through *Pharm Presse*, 40 (1935), 309

(M F W D)

PHARMACEUTICAL LEGISLATION

Drug Code—Brief History of This history is traced from the authorization of a Committee on the Retail Drug Code by the National Association of Retail Druggists, following the enactment of the National Industrial Recovery Act down to time of the decision of the Supreme Court in the Schechter case At the final meeting of the National Code Authority, June 8 1935 it was decided to place all records in the keeping of the secretary for one year and then to turn them over to the AMERICAN INSTITUTE OF PHARMACY for such historical use as can be made of them—E F KELLY *J Am Pharm Assoc* 24 (1935), 767

(Z M C)

Pharmacopœia of the United States and the Federal Food and Drugs Act Attention is directed to the primary purpose of a pharmacopœia and the origin and method of revision of the U S P is discussed Reasons why the Pharmacopœia should not be deleted from the Federal Food and Drugs Act are explained What is meant by a "variation clause" is explained and the question whether reference to the U S P in the Federal Food and Drugs Act may be coupled with the variation clause is discussed at some length That the variation clause is necessary to permit improvement in pharmaceutical substances is explained and also the relation of this clause to the delegation of legislative power In many cases titles employed to designate U S P substances are taken from the English Language and such names cannot be copyrighted The primary purpose of a food and drugs act is to prevent fraud The author summarized his arguments as justifying the following conclusions 1 That a Federal Food and Drugs Act as represented by the Copeland Bill, applies exclusively to foods and drugs while they are within the domain of interstate commerce By the use of no language can the Federal law be made to apply to commerce after it has lost its interstate character After once mingling with the goods of a particular state only the laws of such state can fix the qualities which drugs must possess in order to permit their lawful distribution therein 2 That the definitions for drugs and for adulterated and misbranded drugs as found in the Copeland Bill are such that without the addition of a proper variation clause, only such drugs as complied with U S P standards of strength, quality and purity could be lawfully transported in interstate commerce a condition which if it prevailed would prevent the shipment of hundreds of thousands of tons of drugs and chemicals commonly used in the arts and industries 3 That each new revision of the U S P presents numerous changes in the standards of strength, quality and purity of the drugs described in its monographs and also introduces new drugs and preparations which were not commonly used or even known when the preceding volume was issued If the law making body confers upon the revisers of the Pharmacopœia blanket authority to change the legal obligations of the citizen so as to render him liable to fine and imprisonment for acts which would have been innocent in law if the Pharmacopœia had not been revised it would seem fairly evident that there has been an attempted delegation of law-making power On the other hand if the law permits the use of U S P titles which are parts of common English speech upon articles not of U S P standards upon

condition merely that the label states the fact of such variation, then no new obligation is forced upon the producer when a new Pharmacopœia becomes official. Under any revision of the Pharmacopœia his legal liability remains the same, he will always have the option either of observing U S P standards or of stating upon the labels wherein his product differs from such standards.

4 That it is the common understanding among physicians and pharmacists and taught in all colleges of pharmacy, that the use of a U S P title without the addition of qualifying adjectives or other explanatory words, implies that the product to which it is attached complies with U S P standards of strength, quality and purity. Unless this be the rule, the primary purpose of the Pharmacopœia—to enforce uniformity in properties and potency—would be defeated.

5 That a proper variation clause is one which would require that when a U S P title is attached to a drug of other than U S P standards the qualifying words shall indicate clearly that the drug does not profess to comply with such official standards. The wording of the label should not be obscure or ambiguous, but such as to enable the reader to form an intelligent opinion as to the character of the product.

6 And finally, that the deletion of the variation clause from the Federal Food and Drugs Act would not close interstate commerce to the shipment of medicinal preparations of official drugs which did not comply with U S P standards. The producer would need only to give his product some attractive coined name and ship it as a proprietary specialty, thus setting his own standards, without let or hinderance from any authority."—J H BEAL *J Am Pharm Assoc*, 24 (1935), 759 (Z M C)

Pharmacy in Denmark A discussion of the changes taking place in pharmacy administration in Denmark.—W MAIR *Pharm J*, 135 (1935), 254 (W B B)

Vitamin and Organotherapeutic Preparations, Standardized The Question of Their Unrestricted Commerce in the Wholesale Pharmaceutical Trade. A lecture before the Nordiska Apothecaries and Pharmaceutical Meeting of 1935 in Stockholm, discussing state regulation and control especially of vitamin preparations and gland preparations. Thyroid gland is not considered satisfactorily controlled by chemical means and the biological method of Krogh and Lindberg is recommended. It is noted, however, that the biological methods are still in dispute and that probably the chemical method approved by the Permanent Standards Commission of the League of nations will remain more convenient to use. Vitamin A and D concentrates such as halibut liver oil, Calciferol, B vitamin preparations such as rice polishings extracts, yeast extracts and liver extracts are cited as examples of preparations needing biological control. The problem of cost to the state is considered.—J K GALDBAER *Arch Pharm og Chem*, 42 (1935), 427, 441 (C S L)

MISCELLANEOUS

Pharmacist and the Podiatrist The opportunities for pharmaceutical work in supplying the podiatrist or chiropodist are hardly touched. A considerable number of substances and formulas are listed. The classification indicates the scope. Dusting powders, emollients, massage preparations, karyolytics—preparations for softening of abnormal growths, escharotics, preparations used in the treatment of ring worm infections, hyperhidrosis and bromidrosis, skin stimulants.—W F AMBROZ *J Am Pharm Assoc*, 24 (1935), 774 (Z M C)

Professional Pharmacy and Chemical-Pharmaceutical Industry in the Soviet Union—State of Impressions from a Tour A detailed account of the impressions gained by a Swedish apothecary on a tour in the Soviet Union studying the organization of the professional apothecaries, service and the state of the chemical and pharmaceutical industry. Both the public apothecaries and the hospital dispensaries are considered, also the schools of pharmacy, especially the Moscow Institute or College. There are in the Union 126 schools awarding the assistant's certificate and three 'high schools' or colleges of higher study. The Moscow Institute trains both apothecaries' assistants and physicians' assistants. The three-year pharmacy course is open to students over 16 and under 35 years of age who have had at least seven years of lower school. After passing the assistant's examination three years of practice in an apothecary shop are required before the candidate may enter higher studies. At least two years of study for the higher degree are necessary. The subjects of curriculum are cited. The Moscow Institute has about 150 teachers and 1400 students. Descriptions of visits to Russian pharmaceutical industrial works are also of interest. At one works digitals and adonis glucoside extraction, manufacture of chloroform, and synthesis of plasmochin, bromvalerylurea, diethylmalonylurea, sajodin, phenylecinchonic acid

and other drugs were observed and also the manufacture of photographic chemicals was seen. At a manufacturing pharmacy works, various organic and inorganic drug preparations were seen in manufacture. At this works 300-400 different varieties were made. The staff here numbered about 1000 workers. Large and well-equipped control and experimental laboratories were attached. The working men's recreation house is described with dining hall, amateur theater, library of 6000 volumes, school rooms including a chemical laboratory, etc. A factory making bandage and other first-aid equipment was also visited. The State Chemical Pharmaceutical Research Institute in Moscow is also described. Here about 120 academically trained scientific workers, many with one or two assistants, were found engaged in research. In one division twenty physicians were employed in therapeutic research. Among the various fields of research one laboratory was set aside for alkaloid research, another for research on analysis of organic compounds, others for inorganic and for electrolytic analytical research. A rare earth research laboratory was noted. Sufficiently large scale apparatus was available so that new chemical compounds might be prepared in quantities sufficient for clinical testing when that stage was attained. New pyridine and acridine preparations were seen in preparation. The latter was an agent for treatment of malaria called 'Akrikirin'. The pharmacological division of the Research Institute with its animal house, etc., was also inspected.—T. WIKANDER *Farm Revy*, 34 (1935) 477, 489 501 513 526 542 (C S L)

PHARMACOLOGY TOXICOLOGY AND THERAPEUTICS

PHARMACOLOGY

Alcohol Injected Intravenously—Effect of Habituation on Rate of Metabolism. A daily intake of from 5 to 7 cc of alcohol per Kg for a period of three months does not result in an increased rate of alcohol metabolism in the dog. Since it has been shown by others that absorption of alcohol is increased rather than decreased by habituation, we are left with the factor of increased tissue resistance to explain acquired tolerance to alcohol, if such exists in fact. Direct evidence that such tolerance exists is wanting.—HENRY W. NEWMAN and WINDSOR C. CUTTING. *J Pharmacol*, 55 (1935) 88 (H B H)

Alkaloids of Fumaraceous Plants—Pharmacological Action of II. Corydine. The effects of corydine on intact animals, animals arranged for recording blood pressure, the isolated uterus and the isolated heart have been studied. In the intact animals an initial stage of drowsiness followed by drowsiness alternating with fibrillary twitches in isolated muscles was demonstrated. In larger doses the animal developed strychnine-like convulsions which involved the muscles of respiration resulting in death due to asphyxia. Injected intravenously in rabbits corydine produced an initial fall in blood pressure followed by a return to normal or above normal. Added to a bath containing the excised uterus, corydine produced increased tone and height of contraction. The perfused frog's heart showed increased tone and considerable slowing.—R. A. WAUD. *J Pharmacol*, 55 (1935) 40 (H B H)

Amytal and Amidopyrine—Effect of, on Blood Picture of the Albino Rat after a Deficient Diet. The white blood count of rats, weakened by a deficient diet, may be reduced approximately 50% by oral administration of amytal and amidopyrine. Granulocytes do not disappear from the blood stream.—ERMA SMITH and L. MACK. *Proc Soc Exptl Biol Med*, 32 (1935) 1623 (A E M)

Arsenicals, K 324 and K 352—Trypanocidal Action of, on Infections in Mice and Rabbits. A comparison of the trypanocidal action of K 324 (I, p-NH-CO-C₆H₄-As(SCH₃CH(NH)COOH)) K 352 (II, 2-(diglutathionylarsyl)-5-acetamidophenol) and sodium N-carbamylmethylarsanilate (III, tryparsamide). The maximum tolerated dose by a single slow intravenous injection of an approximate neutral solution was 0.075-0.2 and 3-3.5 mg/g of mouse. Trypanosome infections in mice varied somewhat in the ease with which they could be cured. The order of increasing difficulty of cure was *T. brucei*, *T. rhodesiense* and *T. equiperdum*. The therapeutic index (minimum curative dose/maximum tolerated dose) for the respective trypanosomes was with I 1/10, 1/7.5 and 1/3.75; with II 1/20, 1/20 and 1/10. Doses of 0.01 mg/g or more of I or II and of 0.75 mg/g of III cleared the peripheral blood of *T. gambiense* infections for long periods. Relapses were common after treatment with 0.005 mg/g of I or II. Negative findings in the peripheral blood did not necessarily indicate freedom from *T. gambiense* infection.

Trypanosomes may be present in the brain circulation without untoward signs of infection. No curative value of I or II for *T. congolense* infections in mice was apparent. It was found that a total dose of 0.03 g/Kg of I in 3 injections, 0.04 g/Kg of II in 4 injections and 0.75 g/Kg of III in 3 injections would effect permanent cures of rabbits infected with *T. rhodesiense*. Thus only 2-3% as much as in the form of I or II is required as in III. Permanent cures in rabbits were produced, though less effectively, by single intravenous injection of 0.015-0.02 I/Kg or 0.02-0.04 g II/Kg.—WINIFRED I. STRANGEWAYS *Ann. Trop. Med.*, 29 (1935), 231, through *Squibb Abstract Bull.*, 8 (1935), A-1360.

Dialkylaminoethoxyethyl-*p*-aminobenzoates—**Local Anesthetic Action of** Dialkylaminoethoxyethyl *p*-aminobenzoates of the general formula $p\text{-H}_2\text{NC}_6\text{H}_4\text{COOCH}_2\text{CH}_2\text{OCH}_2\text{CH}_2\text{NR}_2$ where R was methyl, ethyl, *n* propyl and *n* butyl radicals were prepared and their toxicity, intracutaneous and surface anesthesia and irritation were determined. The dimethyl derivative did not cause topical anesthesia. Toxicity and anesthetic action increased as R increased. They showed no irritation. Their preparation and physical properties are given.—LEONE A. RUBERG and R. L. SHRINER *J. Am. Chem. Soc.*, 57 (1935), 1581 (E. B. S.)

Digitalis, Strophanthus and Squill—**Use of Rabbits in Assay of** Study has been made of the value of rabbits for the assay of strophanthus, digitalis and squill. The rabbit is less sensitive than the cat to ouabain, strophanthus or squill, but more sensitive than the dog or guinea pig to the two former. To digitalis it is the most resistant of these four species. The advantages of the use of rabbits lie in the short duration of each experiment, and the ease with which a stock of animals can be obtained. The disadvantage is the fact that to attain the same degree of accuracy more animals must be used on each test. Where comparison has been made results obtained on rabbits agree with those obtained with the use of cats.—G. N. RAPSON and S. W. F. UNDERHILL *Pharm. J.*, 135 (1935), 797 (W. B. B.)

Diphenyl Compounds—**Therapeutic Substances Derived from Unsymmetrical III** Some Aryl Esters of the Hydroxy Diphenyls. A number of aryl esters of 2, 3- and 4-hydroxy-diphenyls and some of their substitution products were prepared. The hydroxy diphenyls (*o*, *m*- and *p*-phenyl phenol) are active, non-toxic germicides and it was hoped that by oral administration in the form of ester they might reach the urine unmetabolized and there exert germicidal action. Fifteen esters were made and tested. Experimentation on animals showed that they have no value as urinary antiseptics. Rabbits were used. The compounds with their crystallizing media, their melting points and analyses are listed.—S. E. HARRIS and W. G. CHRISTIANSEN *J. Am. Pharm. Assoc.*, 24 (1935), 553 (Z. M. C.)

Epithelial Anesthesia Experiments on humans affected with solar burns indicated that of the various alkyl para aminobenzoates the ethyl derivative (benzocaine) when administered in oil failed to produce sufficient anesthesia to allay the pain, the propyl and butyl derivatives showed very little difference in their action and afforded the patient practically complete relief, the amyl derivative was not studied since with an increase in the molecular weight of the alkyl radicle there is increased difficulty and expense in manufacture and increased potential epithelial irritation. Evidence indicates that the greater the solubility of the derivative in the oil, the greater the action on the epidermal tissue, the greater the solubility in water the greater the action on the intact mucous membrane. An anesthetic of the quinoline group induced action more rapidly but after 1/2 hour no difference could be determined from that produced by the propyl derivative. Substitutions or additions in the amine or alkyl radicle result in a diminution of the action.—L. STAMBOVSKY *Drug and Cosmetic Ind.* 37 (1935), 175-176, 192 (H. M. B.)

Ergometrine—**Concerning Some Pharmacological Effects of** Crystalline ergometrine was tested on a dog using the method utilizing the power of the ergot alkaloids for paralyzing the adrenaline sensitive renal vasoconstrictors. It was shown to act similarly to the other ergot alkaloids but required a greater quantity than ergotoxine or ergotamine to produce the same action which, however, was more lasting.—RAYMOND HAMET *Compt. rend.*, 201 (1935), 176 (G. W. H.)

Ether—**Studies on Dosage of, after Pre-anesthetic Medication with Narcotics** (Barbiturates, Magnesium Sulphate and Morphine). Dogs were used as experimental subjects, and ether administered both by the open mask method and by the use of the Forreger apparatus. Determinations were made as to the blood ether concentration during the stage of surgical anesthesia and stoppage of respiration when ether was administered in combination with various

hypnotics The margin of safety in ether anesthesia is neither increased nor decreased by preliminary medication with sedative doses of morphine or the barbiturates mentioned It is lessened with magnesium sulphate The advantage of giving morphine or the barbiturates lies in the mental and physical relaxation they produce—FRANK A CALDERONE *J Pharmacol*, 55 (1935), 24 (H B H)

Liver and Stomach Preparations—Assay of The assay is based on decrease in erythrocytes under the influence of phenylhydrazine-anemia Animals of equal weight are fed the same diet and the number of erythrocytes in the blood determined Two or three days later, all animals receive a subcutaneous injection of 16 mg phenylhydrazine hydrochloric acid (1% aq solution) per Kg and thereupon also a subcutaneous or oral dose of the antianemic substances 1-2 animals serving as controls The antianemic principle is given only once, each animal receiving a different dose or every 2 animals the same dose The decrease in the erythrocyte number reaches its maximum in 48-72 hrs after injection in the controls, while in the animals treated with liver or stomach preparations the maximum appears 96-120 hours after injection, i e, about 48 hours after the control maximum Assaying and comparing of active preparations are made on this basis—JOSEPH ERDOS *Biochem Z* 277 (1935) 342, through *Squibb Abstract Bull* 8 (1935), A 806

Male Sex Hormones—Biological Evaluation of the A review—J W JUNG *Apoth Ztg*, 50 (1935), 525-526 (H M B)

Pentobarbital, Chloral Hydrate and Avertin—Relative Efficacy of a Series of Analeptics as Antidotes to Sublethal and Lethal Doses of The antidotal efficiency of artificial respiration, of an atmosphere of 10% carbon dioxide, and medication with picrotoxin, metrazol "coramine," caffeine, cocaine, strychnine, sodium 2,4-dinitrophenol "icoral," nicotine and combinations of ephedrine and the more effective of the agents was noted upon adult albino rabbits to which had been given either pentobarbital, chloral hydrate or avertin Sixteen hundred experiments were performed from which the following conclusions were drawn All procedures tested were found to have more or less symptomatic value in antidoting temporarily the depressant effects of the hypnotics The degree and duration of action of each analeptic was inverse to the depth of hypnosis and with few exceptions, the order of antidotal efficiency of the series of agents or procedures was the same for each of the hypnotics The order of practical usefulness of the several therapeutic measures judged by the degree of improvement in respiration, circulation and reflex excitability, degree of shortening of the usual stages of recovery and the margin of safety of effective dosages of each agent, from high to low is as follows picrotoxin metrazol, ephedrine, artificial respiration, "coramine," icoral, strychnine and caffeine sodio-benzoate Large to lethal doses of each of the hypnotics produce significant depressive effects on respiration and the circulation The most satisfactory therapeutic measures therefore, included combined medication with ephedrine and either picrotoxin, metrazol or "coramine" Tolerance to these preparations parallels the degree of depression present, particularly with the convulsants The dosage and frequency of administration of the antagonists must be gaged by the duration of the optimal response observed and the relative need for supportive treatment Artificial respiration especially with gas mixtures containing 5 to 10% of carbon dioxide is highly effective as a single resuscitation measure against lethal doses of these hypnotics This procedure because of its safety and high degree of effectiveness after paralysis of the respiratory center is considered to be of outstanding usefulness either alone or in conjunction with other analeptic measures Ephedrine is particularly effective in modifying the effects of sedative to moderately toxic doses of avertin or chloral hydrate primarily because of the circulatory depressant effects of these hypnotics However, large doses of ephedrine should be used with caution in avertin or chloral poisoning in that an added depression may occur This alkaloid on intravenous administration tends to produce cardiac irregularities and occasionally pulmonary edema Caffeine in dosages far exceeding those used clinically moderately improved the respiration of animals depressed by these hypnotics Excessive doses of this alkaloid produced in addition to the initial stimulant action, a secondary depression which was additive with that of the hypnotics Artificial respiration is definitely superior to caffeine as a therapeutic measure in antidoting single 100% lethal doses of pentobarbital—O W BARLOW *J Pharmacol* 55 (1935) 1 (H B H)

Pharmaceutical Research—Application of Statistical Methods to IV Methods of Recording Drug Action Interpretation of minimum effective dose (MED) minimum tolerated dose (MTD) or minimum lethal dose (MLD) absolute lethal dose (ALD) or certain lethal

dose (CLD) is discussed. Different interpretations make it impossible to compare results of different investigators. Variability expressed in terms of a "standard curve" proved a good thing. Trevan proposed the "LD₅₀" dose as a basis of measurement, that is, a dose affecting half the test animals. The present paper reports on aconitine, picrotoxin, morphine and strychnine. Tabulations of dosage as well as graphs are shown. "By using a subscript before the statement of effect to indicate the number of animals employed and another after it to indicate the degree of response used as a criterion ($nLD\%$), drug action may be quantitatively recorded with maximum convenience and minimum labor"—J. C. MUNCH and F. E. GARLOUGH. *J. Am. Pharm. Assoc.*, 24 (1935), 619 (Z. M. C.)

Progesterin, Crystalline—Inhibition of Uterine Motility with, in Vivo. In experiments with rabbits with uterine fistulas to allow tractions, A. and R. found that impure corpus luteum extracts containing progesterin completely inhibited uterine motility in 1 hr. after injection of 12 rabbit units in 2 hrs. with 0.6 units and 4 hrs. with 0.3 units. With the pure prismatic form of the hormone, inhibition occurred in 3.75 hrs. with 0.2 rabbit unit (0.26 mg.) and in 2.5 hrs. with 0.4 unit. Injection of the pure needle form of progesterin gave similar results. Thus the 2 crystalline forms of the hormone showed no physiological differences, both being able to suppress uterine motility. Since the pure hormone and the impure extract both had the same inhibiting capacity per rabbit unit, both inhibition of motility and progestational proliferation of the endometrium were caused by the same hormone.—WILLARD M. ALLEN and SAMUEL R. M. REYNOLDS. *Science*, 82 (1935), 155, through *Squibb Abstract Bull.*, 8 (1935), A 1368.

Saliva Tests. III. Detection of the Administration of Some Opium Derivatives to Horses. Reference is made to previous reports of a method for detecting morphine and heroin in saliva of horses after subcutaneous or intramuscular injection of known drugs. Thresholds for mouse tests are given for the following alkaloids: morphine, codeine, dihydromorphine, dihydromorphine, dihydromorphine and heroin. Normal salivas from over one hundred untreated horses have been injected into mice and none had an effect resembling that of opium alkaloids. Since "doping" of horses is not permitted by Racing Commissions it seemed advisable to conduct experiments simulating race-track conditions. Twenty horses were injected subcutaneously with colorless solutions, the composition being unknown to investigators. Gelatin capsules, whose contents were unknown, were administered by mouth to seventeen horses. Details of procedure are reported. Based upon the observations on mice an attempt was made to answer two questions: "(1) Do the mouse tests on salivas from a horse suggest that the animal has been 'doped,' (2) If 'doped,' was a large or small amount of drug administered?" After opinions as to "doping" and dose were recorded code numbers were consulted. These results were tabulated. Opinions of veterinarians did not always agree. The mouse tests were correct in every instance both as to whether horse had been doped and size of dose. Further experimentation was conducted after the horse had been galloped two miles and saliva sample collected an hour and a half after administration. At the end of a week and after two months, these samples gave positive results. Veterinarians were unable to observe abnormalities in the horse. Further tests indicated that morphine is somewhat more potent than a corresponding dose of opium. Pantopon was moderately effective. Studies are being continued to try to find characteristic symptoms for each product. At present information does not permit identification in all cases.—JAMES C. MUNCH. *J. Am. Pharm. Assoc.*, 24 (1935), 557 (Z. M. C.)

Testicular Hormone—Assay for, by the Comb-Growth Reaction. II. The direct measurement of the increases in height and length of the capon comb is easily reproducible. The differences in these values as determined independently by two observers involving 548 measurements on two hundred and seventy-four capons range from 0 to 0.8 mm. with an average difference of 0.3 mm. The comb growth response after five daily injections is more satisfactory as a quantitative measure than after two daily injections. The initial size of the comb must be taken into account in evaluating the comb growth response to the male sex hormone. For the five-day assay method, this involves a correction of 0.17 mm. comb growth for every millimeter difference in the initial length of the comb. This correction value holds over the range of growth employed for assay purposes. The quantitative response of the capon's comb to a given dose is not seriously influenced by age and by repeated use in assays. The body weight of the capon influences the response slightly. A difference of 500 Gm. in body weight calls for a correction of 0.4 mm. in comb growth response after five daily injections. The "characteristic curve" expressing the relation of increase in length plus height to dosage of male hormone has been established with

hypnotics The margin of safety in ether anesthesia is neither increased nor decreased by preliminary medication with sedative doses of morphine or the barbiturates mentioned It is lessened with magnesium sulphate The advantage of giving morphine or the barbiturates lies in the mental and physical relaxation they produce —FRANK A CALDERONE *J Pharmacol*, 55 (1935), 24 (H B H)

Liver and Stomach Preparations—Assay of The assay is based on decrease in erythrocytes under the influence of phenylhydrazine anemia Animals of equal weight are fed the same diet and the number of erythrocytes in the blood determined Two or three days later, all animals receive a subcutaneous injection of 16 mg phenylhydrazine hydrochloric acid (1% aq solution) per Kg and thereupon also a subcutaneous or oral dose of the antianemic substances, 1-2 animals serving as controls The antianemic principle is given only once, each animal receiving a different dose or every 2 animals the same dose The decrease in the erythrocyte number reaches its maximum in 48-72 hrs after injection in the controls, while in the animals treated with liver or stomach preparations the maximum appears 96-120 hours after injection *et al*, about 48 hours after the control maximum Assaying and comparing of active preparations are made on this basis —JOSEPH ERDOS *Biochem Z* 277 (1935) 342, through *Squibb Abstract Bull*, 8 (1935), A 806

Male Sex Hormones—Biological Evaluation of the A review —J W JUNG *Apoth Ztg*, 50 (1935), 525-526 (H M B)

Pentobarbital, Chloral Hydrate and Avertin—Relative Efficacy of a Series of Analeptics as Antidotes to Sublethal and Lethal Doses of The antidotal efficiency of artificial respiration, of an atmosphere of 10% carbon dioxide, and medication with picrotoxin, metrazol "coramine," caffeine cocaine, strychnine sodium 2,4-dinitrophenol "icoral" nicotine and combinations of ephedrine and the more effective of the agents was noted upon adult albino rabbits to which had been given either pentobarbital, chloral hydrate or avertin Sixteen hundred experiments were performed from which the following conclusions were drawn All procedures tested were found to have more or less symptomatic value in antidoting temporarily the depressant effects of the hypnotics The degree and duration of action of each analeptic was inverse to the depth of hypnosis and with few exceptions the order of antidotal efficiency of the series of agents or procedures was the same for each of the hypnotics The order of practical usefulness of the several therapeutic measures, judged by the degree of improvement in respiration circulation and reflex excitability degree of shortening of the usual stages of recovery and the margin of safety of effective dosages of each agent, from high to low is as follows picrotoxin metrazol, ephedrine, artificial respiration "coramine," "icoral," strychnine and caffeine sodium-benzoate Large to lethal doses of each of the hypnotics produce significant depressive effects on respiration and the circulation The most satisfactory therapeutic measures therefore included combined medication with ephedrine and either picrotoxin, metrazol or "coramine" Tolerance to these preparations parallels the degree of depression present particularly with the convulsants The dosage and frequency of administration of the antagonists must be gaged by the duration of the optimal response observed and the relative need for supportive treatment Artificial respiration especially with gas mixtures containing 5 to 10% of carbon dioxide is highly effective as a single resuscitation measure against lethal doses of these hypnotics This procedure because of its safety and high degree of effectiveness after paralysis of the respiratory center is considered to be of outstanding usefulness either alone or in conjunction with other analeptic measures Ephedrine is particularly effective in modifying the effects of sedative to moderately toxic doses of "avertin" or chloral hydrate primarily because of the circulatory depressant effects of these hypnotics However, large doses of ephedrine should be used with caution in "avertin" or chloral poisoning in that an added depression may occur This alkaloid on intravenous administration tends to produce cardiac irregularities and occasionally pulmonary edema Caffeine in dosages far exceeding those used clinically moderately improved the respiration of animals depressed by these hypnotics Excessive doses of this alkaloid produced in addition to the initial stimulant action a secondary depression which was additive with that of the hypnotics Artificial respiration is definitely superior to caffeine as a therapeutic measure in antidoting single 100% lethal doses of pentobarbital —O W BARLOW *J Pharmacol*, 55 (1935), 1 (H B H)

Pharmaceutical Research—Application of Statistical Methods to IV Methods of Recording Drug Action Interpretation of minimum effective dose (MED) minimum tolerated dose (MTD) or minimum lethal dose (MLD) absolute lethal dose (ALD) or certain lethal

dose (CLD) is discussed. Different interpretations make it impossible to compare results of different investigators. Variability expressed in terms of a "standard curve" proved a good thing. Trevan proposed the "LD₅₀" dose as a basis of measurement, that is, a dose affecting half the test animals. The present paper reports on aconitine, picrotoxin, morphine and strychnine. Tabulations of dosage as well as graphs are shown. "By using a subscript before the statement of effect to indicate the number of animals employed and another after it to indicate the degree of response used as a criterion ($nED\%$), drug action may be quantitatively recorded with maximum convenience and minimum labor"—J C MUNCH and F E GARLOUGH *J Am Pharm Assoc*, 24 (1935), 619 (Z M C)

Progesterin, Crystalline—Inhibition of Uterine Motility with, in Vivo In experiments with rabbits with uterine fistulas to allow tractions, A and R found that impure corpus luteum extracts containing progesterin completely inhibited uterine motility in 1 hr after injection of 12 rabbit units in 2 hrs with 0.6 units and 4 hrs with 0.3 units. With the pure prismatic form of the hormone, inhibition occurred in 3.75 hrs with 0.2 rabbit unit (0.26 mg) and in 2.5 hrs with 0.4 unit. Injection of the pure needle form of progesterin gave similar results. Thus the 2 crystalline forms of the hormone showed no physiological differences, both being able to suppress uterine motility. Since the pure hormone and the impure extract both had the same inhibiting capacity per rabbit unit, both inhibition of motility and progestational proliferation of the endometrium were caused by the same hormone—WILLARD M ALLEN and SAMUEL R M REYNOLDS *Science*, 82 (1935), 155, through *Squibb Abstract Bull*, 8 (1935), A-1368

Saliva Tests III Detection of the Administration of Some Opium Derivatives to Horses Reference is made to previous reports of a method for detecting morphine and heroin in saliva of horses after subcutaneous or intramuscular injection of known drugs. Thresholds for mouse tests are given for the following alkaloids: morphine, codeine, dihydromorphine, dihydromorphine and heroin. Normal salivas from over one hundred untreated horses have been injected into mice and none had an effect resembling that of opium alkaloids. Since "doping" of horses is not permitted by Racing Commissions it seemed advisable to conduct experiments simulating race-track conditions. Twenty horses were injected subcutaneously with colorless solutions, the composition being unknown to investigators. Gelatin capsules, whose contents were unknown, were administered by mouth to seventeen horses. Details of procedure are reported. Based upon the observations on mice an attempt was made to answer two questions: "(1) Do the mouse tests on salivas from a horse suggest that the animal has been 'doped,' (2) If 'doped,' was a large or small amount of drug administered." After opinions as to "doping" and dose were recorded code numbers were consulted. These results were tabulated. Opinions of veterinarians did not always agree. The mouse tests were correct in every instance both as to whether horse had been doped and size of dose. Further experimentation was conducted after the horse had been galloped two miles and saliva sample collected an hour and a half after administration. At the end of a week and after two months, these samples gave positive results. Veterinarians were unable to observe abnormalities in the horse. Further tests indicated that morphine is somewhat more potent than a corresponding dose of opium. Pantopon was moderately effective. Studies are being continued to try to find characteristic symptoms for each product. At present information does not permit identification in all cases—JAMES C MUNCH *J Am Pharm Assoc*, 24 (1935), 557 (Z M C)

Testicular Hormone—Assay for, by the Comb-Growth Reaction II The direct measurement of the increases in height and length of the capon comb is easily reproducible. The differences in these values as determined independently by two observers involving 548 measurements on two hundred and seventy-four capons range from 0 to 0.8 mm with an average difference of 0.3 mm. The comb-growth response after five daily injections is more satisfactory as a quantitative measure than after two daily injections. The initial size of the comb must be taken into account in evaluating the comb growth response to the male sex hormone. For the five day assay method this involves a correction of 0.17 mm comb growth for every millimeter difference in the initial length of the comb. This correction value holds over the range of growth employed for assay purposes. The quantitative response of the capon's comb to a given dose is not seriously influenced by age and by repeated use in assays. The body weight of the capon influences the response slightly. A difference of 500 Gm in body weight calls for a correction of 0.4 mm in comb growth response after five daily injections. The "characteristic curve" expressing the relation of increase in length plus height to dosage of male hormone has been established with

greater accuracy For the most accurate observations, an absolute increase in comb size cannot be taken for the bird unit basis because the light factor influences the comb growth response remarkably Hence it is best to express all assays in terms of a standard preparation which is assayed in parallel with each set of unknowns —T F GALLAGHER and F C KOCH *J Pharmacol* 55 (1935), 97 (H B H)

Thyroid Glands—Culture of Entire The successful culture of 15 thyroid glands, 6 from cats and 9 from cocks, is described This is accomplished by means of a new apparatus (mechanical heart and lungs), using three nutrient media, one consisting of diluted blood serum, a second a solution of acid amines and a third a solution containing peptones In the first two liquids, the glands diminished in volume while in the third they showed a decided increase doubling in weight in 3 or 4 days —ALEXIS CARRIEL and CHARLES LINDBERGH *Compt rend*, 201 (1935), 14 (G W H)

Trichlorethylene—Study of the Anesthetic Properties of In the course of another study the anesthetic properties of trichlorethylene were investigated Using albino rats, inhalation produced surgical anesthesia in four or five minutes Recovery was prompt Marked stimulation of skeletal musculature accompanied anesthesia Effect of treatment, along with control growth curve, is shown by chart High rectal injections of solutions on rabbits did not produce anesthesia but were exceedingly irritating to colonic mucosa Blood sugar level was determined on rabbits after inhalation anesthesia Mild hyperglycemia resulted Applied to sciatic nerve it did not block blood pressure or respiratory response of faradization —JOHN C KRANTZ JR, C JELIFF CARR and RUTH MUSSER *J Am Pharm Assoc*, 24 (1935) 754 (Z M C)

Ultraviolet Light—Investigation of the Protective Effect of Various Preparations against Five preparations (constituents not given) are tested for their protective power against ultraviolet light To avoid the variation in the intensity of light from the sun an ultraviolet lamp is used throughout, at a distance of 1 meter from the skin Rectangles are marked on the skin the spaces between covered with a material impervious to ultraviolet light, and the five preparations applied in equal amounts, one to each block and leaving one block uncoated as a control Photographs of the skin are taken at intervals of 2½, 6 and 16 hours after exposure to the light Only one preparation (Dr Wild Balsam) showed any appreciable protective effect Plates accompany the article —S WILD *Schweiz Apoth Ztg*, 73 (1935), 413 (M F W D)

Valerian Root and Valerian Preparations—Assay of Using a biological assay in frogs, different types of valerian preparations are evaluated including infusions made in various ways, fluid extracts and tinctures The tinctures are reported biologically the most active, the fluid extract is next in order of activity and the ordinary infusions are least active The ash content moisture and volatile constituents of several commercial specimens of the root pulverized and sieved to different degrees of fineness are reported Methods of determining the essential oil content are also studied —A NYLANDER *Farm Revy*, 34 (1935) 531, 548 560 (C S L)

Yohimbine—Non-modification of the Sympatholytic Action of, by the Introduction of a Double Bond Apoyohimbine which differs from yohimbine by the introduction of a double bond into ring E, was injected into a dog and its power to antagonize the hypertensive and renal vasoconstrictor action of adrenaline measured From the results obtained, it was concluded that apoyohimbine differs only slightly from yohimbine in its action —RAYMOND-HAMET *Compt rend*, 201 (1935), 434 (G W H)

TOXICOLOGY

Alpha-Dinitro-o-Cresol—Toxic Reaction to A case of a toxic reaction to alpha dinitro o cresol (total dose 1.5 G in 11 days) in a 14.5 yr old obese patient is reported The symptoms were marked drowsiness, headache nausea, vomiting, swelling of the fingers and hands, an itching maculo papular rash, greenish yellow coloration of the sclera but no signs of jaundice of the skin or mucous membranes, and extremely dark colored urine in which bile could not be detected, the icteric index was 24.75 and the Van den Bergh reaction negative, indicating no true hepatic involvement —MURRAY B GORDON and MARK J WALLFIELD *Ann Internal Med*, 9 (1935) 198 through *Squibb Abstract Bull*, 8 (1935), A-1369

Antidote for Heavy Metal Poisoning—A New Stabilized The stabilized antidote for heavy metals is prepared as follows 2 liters of water are heated to boiling for one minute, 2 Gm of pure NaOH dissolved in one half of the volume, which after cooling is saturated with hydrogen

sulphide previously washed by passage through a suspension of calcium carbonate in water. In the remainder of the water is dissolved 2 Gm of magnesium chloride and 25 Gm of sodium bicarbonate. On cooling, the second solution is poured into the first and the whole saturated with hydrogen sulphide at -2° to -3° C. The solution is then stored in a refrigerator in 125 cc flasks fitted with rubber stoppers, tied in and paraffined. This preparation can be kept for three years without deterioration. The author describes the physical and chemical properties of the antidote, a method of standardizing it, and the metals for which it may be employed. The antidote when taken orally produces only temporary discomfort and is relatively non toxic. It may also be used to wash heavy metal salts out of the eyes. To test the efficacy of a three year-old sample, the author drank 50 cc of solution containing 0.2 Gm mercuric chloride and then 50 cc of the antidote. With the exception of some irritation of the throat, none of the characteristic symptoms of mercury poisoning was evidenced, and in 5 days the throat soreness had cleared up. — C STRZYLOWSKI *Scientia Pharm*, 6 (1935) 94 (M F W D)

Arsphenamine Poisoning—Occurrence of, among Negro Women Of 14 cases of arsphenamine dermatitis observed by the authors in 1930–1934 11 occurred in negroes. The average dosage of the arsenical was 0.45 Gm and the patients averaged 4.5 doses of neoarsphenamine before the reactions were sufficiently severe to interrupt treatment. Two of the cases were fatal. Nine of the 11 cases showed a marked generalized exfoliative dermatitis and 8 showed an accompanying pruritis. Epinephrine (adrenaline) injections gave a marked relief from the pruritis, in 1 case 5 minims gave complete relief for 4 hrs. Two of the patients developed no skin lesions and were the only 2 who had no pruritis but had a high icteric index. Fever appeared early in some cases and lasted indefinitely but the nature of the causes was undetermined. All except 1 case showed abnormally high eosinophile counts. Since symptoms and skin changes in the negro are frequently unobserved or unheeded the physician is occasionally unable to prevent a fatality, and the mental attitude of the negro is such that treatment with arsenic is persisted in until the poisoning is well established. The negress has fragile veins of small caliber, thus accounting for the frequency of arsphenamine poisoning in the female sex. — GROESBECK WALSH and COURTNEY S STICKLEY *Am J Syphilis Neurology*, 19 (1935), 323, No 3, through *Squibb Abstract Bull* 8 (1935), A-1175

Bismuth Poisoning Pharmacodynamics and Toxicology of Bismuth A case of syphilis which had been treated by Bismuth cinchophen oil suspension (Bismophanol) showed a brownish green, 1-cm wide streak on the left leg corresponding to the course of the Vena saphena magna and being 38 cm in length. Experimental histological studies were then made and it was found that under pathological conditions there is an increased deposition of bismuth in diseased tissue, especially syphilitic granulation tissues. This substantiates similar finds of other observers. — H SAUFERLIN *Dermatol Wochschr*, 100 (1935), 585, No 21, through *Squibb Abstract Bull*, 8 (1935), A-877

Cosmetic Products—Dangers of The *Ciba Zeitschr* calls attention to the fatal accidents caused by the products in use in certain beauty salons. The dangers are increased when the application of certain dye products precede the removal of hair. The use of dimro phenol in the treatment of obesity is also extremely dangerous. — J SÜSSE *Pharm*, No 16 (1935), 198, through *J pharm Belg*, 17 (1935) 591 (S W G)

Cyanide Poisoning and Its Treatment A table of mortality statistics shows an increase in deaths from cyanide poisoning from 1930 to 1932. Cases are listed as suicidal, occupational, accidental and homicidal. A number of sources are given for occupational and accidental cases. In general over 90% are suicidal. In some places in the west, cyanogenetic plants are the cause of large losses among animals. Ten points are listed as aids to diagnosis. Five important tests for legal purposes, with reagents needed, procedure and interpretation of results, are given. The antidote consists chiefly of sodium nitrite and sodium thiosulphate injected intravenously, with amyl nitrite by inhalation. — K K CHEN, CHARLES L ROSE and G H A CLOWES *J Am Pharm Assoc*, 24 (1935), 625 (Z M C)

Gold Therapy—Agranulocytosis with Purpura Hæmorrhagica Following A fatal case of purpura hæmorrhagica with agranulocytosis following gold injections is reported. The prophylaxis and treatment of such cases is discussed. The necessity for frequent hæmatological studies is emphasized. — P ELLMAN and J S LAWRENCE *Brit Med J*, 3900 (1935), 622 (W H H)

Gold Therapy—Prevention and Treatment of Harmful Effects of The harmful effects and contraindications of gold therapy are discussed, fever, pregnancy, advanced tuberculosis, chæmia, diabetes, liver or kidney damage, advanced age changes in the urine, leucocytes, eosinophils (indications of cutaneous erythema) and general symptoms deserve consideration. Therapeutic agents are intravenous injections of sodium thiosulphate, hypertonic dextrose transfusion, pentosenucleotide (in agranulocytosis) and diuretics.—G PIOTROWSKI *Wien med Wochschr* (1935), No 21, through *Squibb Abstract Bull*, 8 (1935), A 889

Hydrocyanic Acid—Antidotes of, and More Particularly the Mechanism of the Antidote Action of Glutathione In experiments on guinea pigs where 1.25 mg hydrocyanic acid per kilo body weight was shown upon injection to be the minimum fatal dose, injection of glutathione in at least half the equimolecular quantity of hydrocyanic acid at the moment of the crisis (asphyxic coma) caused violent tremblings, resumption of breathing and ready recovery. When 2.00 mg hydrocyanic acid per kilo was injected, the toxic action was too rapid to be overcome by glutathione. The antitoxic action of glutathione is not caused by a chemical change of hydrocyanic acid into innocuous thiocyanate compounds for which glutathione is to supply the sulphur, because in animals that survived by means of glutathione, then were killed and examined, hydrocyanic acid was practically absent in the viscera and nontoxic thiocyanate compounds were present in about the same quantity as in parallel cases where hydrocyanic acid was applied without the use of glutathione; hence, sulpho compounds are not chemical antidotes. The action of glutathione at the critical moment of injection starts resumption of breathing sufficiently long to allow elimination of the poison through the lungs. If glutathione is administered in reduced form it is the partial re-oxidation and re-establishment of equilibrium between the two forms of glutathione within the circulation which produces shock, i.e., tremblings, spontaneous resumption of breathing and recovery. Other poisonings, i.e., those that act on tissue respiration, can probably be overcome by glutathione.—M TH REGNIER *11me Congrès de Chimie Industrielle Paris* (Oct 1934) 11 pp (A P C)

Hypnotic Poisoning, Acute—Treatment of Poisoning by hypnotics, particularly the barbituric acid derivatives, is discussed. Therapeutic measures consist of washing the stomach during the first 8 hrs with animal charcoal and sugar lime, N N diethyl nicotinamide (Coramine), camphor which is indicated as a cortical analeptic in convulsions, large doses of strychnine intravenously to antagonize the barbiturates, oxygen, infusions with epinephrine and insulin. Hydroxy α (methylaminomethyl) benzyl alcohol (sympatol) and synthetic ephedrine (ephedronne) often fail.—HANS FISCHER *Schweiz med Wochschr* (1935) Nos 20–21, through *Squibb Abstract Bull*, 8 (1935), A-1375

Pyrethrins—Comparative Toxicity of, with Respect to Different Classes of Animals Pyrethrin emulsions of known concentration were injected into the general cavity of various animals and the average minimum lethal dose determined in mg per Kg. The following were used as test animals: Polypes, sea anemone, Echinodermes, sea urchin and starfish, Crustaceans, crab, sea spider, crawfish, scorpion, Insects, *Blaps requei*, Worms, earth worm, sand worm, leech, Mollusks, oyster, snail and cuttle fish, Cold blooded Vertebrates, frog, green lizard, snake, tortoise, Warm blooded Vertebrates, rat and guinea pig. Pyrethrins showed a special toxicity toward the crustaceans, they being killed by 1/100 to 1/150 mg per Kg. Toward the other classes of animals the toxicity was variable.—OLIVIER GAUDIN *Compt rend* 201 (1935), 356 (G W H)

Sabina—Two Cases of Intoxication by The tops of *Juniperus sabina* L., when taken orally in large doses, sometimes produce abortion followed by fairly serious poisoning. Two fatal cases of such poisoning are discussed, in both of which death occurred without abortion having taken place. The oil of sabina is fixed in the lungs, liver, uterus and kidneys, especially in the lungs and kidneys. Analysis of an aborted foetus showed the presence of oil of sabina in the viscera, which proves the permeability of the placenta to the drug, and which can be valuable for proving abortion in non fatal cases. Preservation of the viscera in formalin reduces the sensitivity of the test from 0.1 Gm to 0.5 Gm, and prevents a positive reaction with alcoholic hydrochloric acid.—MARIE J PAPA VASSILIOU *Ann Med Legale Criminol Police Sci*, 15 (1935), 778–781 (A P-C)

Sodium Formaldehyde Sulfoxylate—Value of, in Mercury Poisoning The authors review the work previously reported on the use of sodium formaldehyde sulfoxylate (I)

in mercurial poisoning I is a powerful reducing agent and is more stable in the body than sodium thiosulphate and sodium hydrosulphite. Owing to its low toxicity as much as 10-15 Gm may be given intravenously in 10% solution, 5-10% as gastric lavage leaving 100-200 cc in the stomach and a 5% solution by enema. Treatment is repeated in severe, acute cases within 4-6 hours and again in 24 hrs. In 1 case reported, treatment consisted of 6 intravenous injections of I over a period of 4 days. In the second case following a large amount of calomel, intravenous injection of I during 4 days was followed by complete recovery. In both of the reported cases, the poisoning was not severe, so that intravenous treatment alone was used. In cases of severe poisoning with mercuric chloride, intravenous injection should be accompanied by oral use and enemas to avoid tissue destruction.—WM E ROBERTSON and VERNON L TUCK *J Chemotherapy*, 12 (1935), 226, No 2, cf *S A B*, 7 (1934), 633, through *Squibb Abstract Bull*, 8 (1935), A-1189

Sodium Perborate Preparations—Harmful Effects of Sodium perborate preparations when used as a mouthwash or dentifrice occasionally produce escharotic effects on the oral mucosa characteristic of chemical burns. This may occur as an idiosyncrasy to the drug, or more likely may be due to sodium hydroxide impurities or the strong essential oil flavorings in the preparation. Two cases are reported in which the symptoms were a burning sensation of the mucous membrane of the mouth which was found to show inflammation and moderate cyanosis, sloughing epithelium on the inner surfaces of the lips, cheeks and buccal folds, thickened cheeks, swollen dry lips, swollen tongue and in one case a typical brown hairy tongue. When a mild saline mouthwash was substituted the symptoms disappeared in 3-4 days. Pin head ulcers seen on the alveolar mucosa or cemental gingiva in the above cases are more frequent when the preparation is used on the tooth brush as a dentifrice, suggesting a traumatic effect of the sharp crystals of the powder.—CHARLES H M WILLIAMS *J Canadian Dental Assoc*, 1 (1935), 267, No 6, through *Squibb Abstract Bull*, 8 (1935) A-906

Toxin X. The author designates as "Toxin X" poisons occurring in whole grain cereals—tea, coffee, cocoa, fruits and certain vegetables picked before maturity, beers and ales, malt extract, yeast, honey, brown sugar, nuts and olive oil. These toxic substances in foodstuffs can be detected by the physiological effects produced by the consumption of liberal quantities of the specified foods over a period which may vary from a few days to a few weeks. The effects referred to are (1) The production of bilious conditions, (2) inflammation of mucous membranes, (3) predisposition of ordinary body tissue to sensitive and painful conditions, (4) marked interference with normal digestive, assimilative and excretory process. "Toxin X" is described as both a tissue poison and an astringent. A diet free from the toxin-bearing foods gives absolute immunity from the disorders.—C W GREEN *J Soc Chem Ind*, 54 (1935), 717 (E G V)

Tribromethanol Anesthesia Solid tribromethanol, used as a general anesthetic, has proved decidedly dangerous. The chief danger from the use of this preparation is respiratory depression, but so far no death has been caused by tribromethanol in amylene hydrate, nor have there been any fatalities from post-operative pulmonary complications.—F SHIPWAY *Clinic Med and Surg*, 42 (1935), 434 (W H H)

Venoms of North American Pit Vipers—Studies on The danger to man from the bites of pit vipers, varies almost directly with the size of the species. The larger species of viper gave the largest number of fatal doses per extraction. The more primitive forms have venoms more toxic to the nerve centers.—T S GITHENS *J Immunol*, 29 (1935), 173 (A H B)

THERAPEUTICS

Adrenaline—Inhalation of, for the Relief of Asthma Using an atomizer which creates a fine vapor-like spray, a 1:100 solution of adrenaline is inhaled while nebulizing the solution into the open mouth. Dosage is determined by the number of inhalations and varies with each individual. For administration to children and babies a motor driven air pump is used to create a continuous spray into a small face mask. The degree of relief obtained by this method is comparable to that resulting from the hypodermic administration of the 1:1000 solution.—J B GRAESER and A H ROWE *Calif and West Med*, 43 (1935), 110 (W H H)

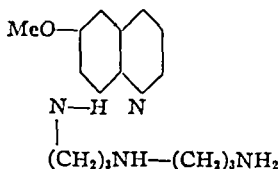
Allergy A general discussion of common allergies, with emphasis on cosmetics.—HERMAN GOODMAN *Am Perfumer*, 31 (1935), 97-100 (G W F)

Anti-Malarial Drugs of Natural Origin The only anti-malarial drugs generally accepted as such are the cinchona alkaloids and the new dialkylaminoalkylaminoquinolines and acridines

Tests in bird malaria were used in an attempt to settle a long outstanding controversy, viz that of the relative, anti malarial efficiency of the various cinchona alkaloids, of which there are eight—quinine, quinidine, cinchonidine, cinchonine, each being accompanied by its dihydro derivatives. The results show they may be arranged in the following descending order of activity

	Quinine Equivalent
Dihydroquinine	1 to 2
Quinine	1
Dihydroquinidine	0.5 to 1.0
Cinchonidine	About 0.5
Quinidine	About 0.5
Cinchonine	Less than 0.2
Dihydrocinchonine	Less than 0.2
Dihydrocinchonidine	Less than 0.2

These results are of interest as supporting the general view that quinine is the most active of the common cinchona alkaloids. Certain derivatives of plasmoquine in which variations had been made in the type of side chain attached to the N of the amino group were promising. One of them corresponding to the formula



had given good results in bird malaria and was worthy of further trial. A brief account of the history of plasmoquine (1924) and atebrin (1930) was also given.—T. A. HENRY, R. ROBINSON and W. SCHULEMANN *Pharm J*, 135 (1935), 276 (W. B. B.)

Antimony Content in Drugs—Consideration of the, Used for Destruction of Schistosomes
The antimony content, therapeutic dose and value and in some cases the tolerated dose and stability have been given for the following: antimony potassium and antimony sodium tartrates, N glucoside of sodium *p* stibanilate (neostam), sodium and potassium antimony pyrocatecholdi sulphonates (fuadin and antimosan, respectively) and the corresponding calcium salt, which is of service in skin conditions for which antimony is used but has no greater value than the other salts in the destruction of schistosomes, antimony bis hydroxyquinoline sulphonate diethylamine (stibilase, Dn 7), antimony methylene bisulphite amino hydroxyquinoline sodium sulphonate (try stibine, Dn 18), acetyl *p* phenylenediamine antimony tartrate, and *p* phenylene diamine antimony tartrate.—F. GORDON CAWSTON *J Trop Med Hyg* 38 (1935) 169 No 14, through *Squibb Abstract Bull*, 8 (1935), A-1151.

Athlete's Foot Three definite forms occur: (1) vesicular, which may appear suddenly on any part of the foot usually between the toes and under the instep, and is characterized by itchy patches of dermatitis; (2) intertriginous, more severe, often painful and intensely itchy, developing between the toes as a white sodden mass of broken skin; and (3) chronic, which may appear on the hands and is identified by hardening of the skin on the infected area. The following formulas are offered: (1) *Lotion*—Sodium thiosulphate 10%, water 90; (2) *Dusting Powder*—Sodium thiosulphate 20%, boric acid 80; (3) *Lotion*—Mercury perchloride 0.3%, carbolic acid acetic acid (glacial) 8, water 89.7; (4) *Paint*—Potassium permanganate 5%, water 95; (5) *Ointment*—Ammoniated mercury 5%, salicylic acid 10, white petrolatum 85; (6) Phenol 2%, benzoic acid 3.5, boric acid 5.5, cold cream 89.—ANON *Drug and Cosmetic Ind*, 37 (1935), 180 (H. M. B.)

Avertin Anesthesia—Treatment of Tetanus with A case of severe tetanus neonatorum with recovery is described. Treatment consisted of one large initial dose of intravenous anti toxin followed by continuous anesthesia with avertin for eleven days and smaller doses for a further twelve days. Nasal oxygen was given continuously for long periods and a normal diet by stomach tube which was left *in situ*. A total of 19.2 cc. of avertin was given in the first eleven days and 22.4

cc altogether in twenty three days It is suggested that treatment on the above lines with large and frequent doses of avertin will prove of great value in the treatment of severe cases of tetanus The need for caution in giving such large doses is emphasized —L COLE *Lancet*, 229 (1935), 246 (W H H)

Azo Dyes—Sulphide Analogues of, Having Bactericidal Properties The present report is a continuation of studies previously reported The compounds prepared are of two types One combined the diaryl sulphide linkage with the *p* ethoxy benzene azo residue of serenium Two combined the diaryl sulphide linkage with the diaminopyridine grouping of pyridium 4, 4'-*Bis* (α,α diaminopyridine azo) diphenyl sulphide and 3, 5 *bis* (4'-amino diphenyl sulphide azo) 2, 6 diaminopyridine They were found to be only slightly soluble in media in which they might be used and they were inactive Details of experimental work are reported and structural formulas of the compounds prepared are given —W BRAKER and W G CHRISTIANSEN *J Am Pharm Assoc*, 24 (1935), 607 (Z M C)

Azochloramid—Use of, in Root Canal Antisepsis Like other chlorine compounds, but unlike all other antiseptics, azochloramid is not markedly group specific, destroying most types of micro organisms In a comparison with other chlorine compounds, namely, chlorinated soda and chloramine-T, a solution of chlorinated soda dropped to 10% and chloramine-T to 50% after four hours, while even after 24 hours most of the azochloramid originally added was still active A quick test for the presence of otherwise invisible quantities of azochloramid is the acidulated starch-iodide test The material to be tested is brought in contact with a small quantity of potassium iodide solution, acidulated with acetic acid or hydrochloric acid and containing a small amount of starch solution The presence of azochloramid causes this solution to assume a blue to black hue owing to the formation of free iodine This test was used as an indicator to trace the degree of penetration of the compound through pulpless teeth Teeth, freshly removed in pyorrhea cases, were opened in the crown and the pulp was removed, the canal cleared and the tooth set in a small block of cement The root canal was filled with an azochloramid dressing, just as if the tooth were still under treatment in the patient's mouth After a day or two test borings were made and small drops of the test solution placed in contact with the dentin In most cases the dark color appeared in 24 hours, showing that penetration of the dentin was accomplished In a series of 63 consecutive cases treated, successful application of azochloramid in treatment was made —H J ROSS *J Am Dent Assoc*, 22 (1935), 637 (T G W)

Bedsore—Treatment of If the skin is rough and excessively dry the following ointment should be rubbed in after the back has been washed with hot water zinc stearate, 5, tincture benzoin, 5, scarlet red ointment 5%, 0.25, hydrous wool fat, 30, liniment of camphor, 180, mutton tallow, 500 For hardening the skin a 5% solution of silver nitrate may be painted on Moist treatment is only indicated in cases of spreading infection or of retained pus Warm boric acid compresses are used and irrigations of solution of chlorinated soda —ANON *Pharm J*, 134 (1935), 565 (W B B)

Calceferol—Treatment of Low-Calcium Tetany with The progress of three cases of low-calcium therapy, treated with calceferol, is described It has been found possible to maintain the patients free from symptoms with normal blood findings Possible toxic effects are discussed —R S STACEY *Lancet*, 229 (1935), 656 (W H H)

Castor Oil—Newer Uses of Castor oil is of the greatest value in gastroduodenal catarrh, colitis and the so called irritable colon In the toxemias associated with chronic constipation and malignant disease, it will be found of greatest assistance Its detoxicating effect on the products of tissue destruction in burns is of more than passing significance In urinary sepsis, as found associated with chronic inflammatory urinary conditions—pyelitis, prostatic hypertrophy, chronic prostatitis and new growths—all other pharmaceuticals used to produce evacuation must give way to castor oil The author claims that salines are dangerous, and therefore are to be avoided in urinary disease —W, S PUGH *Clin Med Surg*, 42 (1935), 324 (W H H)

Chaparro Amargoso—Use of, in Treatment of Amebic Dysentery A literature review is given of the therapeutic use in amebic dysentery of *Chaparro amargoso* (*Castela Nicholsonii*) or bitter bush, a shrub growing in Mexico and Texas The active principle is available under the name Castamaragina In the discussion following the paper Blake describes his experience with the drug It gave excellent results in cases that did not tolerate arsenicals On the other hand, the drug was not tolerated by some two cases showing typical severe allergy Lindley uses the

drug for all kinds of intestinal disorder with excellent results, but Blake found that in amebic dysentery of the upper intestinal type, the best results are obtained with arsenicals such as N carbamyl arsanilic acid (carbarsone) and that emetine is the only drug to be depended on where there is liver involvement —G W VAN HALTERN *J Am Coll Proctology*, 7 (1935), 402, through *Squibb Abstr Bull*, 8 (1935), A 921

Chemotherapeutic Research—Some Lines of A brief survey of some of the lines in which chemotherapeutic research is developing including a discussion of some arsenicals, bismuthals and antiseptics —F L PYMAN *J Soc Chem Ind*, 54 (1935) 580 (E G V)

Cinchophen (Atophan) Therapy and the Liver The action of cinchophen consists in mobilization of uric acid, desinflammation and in stimulation of hepatic secretion The bile secretion may be increased by 300% after 2-3 daily doses of one Gm orally The parenteral dose is 0.5 to one Gm The results in hepatic icterus are very favorable The diet in such cases should be rich in carbohydrates This precaution prevents any damage to the liver B believes, that most cases of cirrhosis after cinchophen treatment would have developed as well without the use of the drug —THEODOR BRUGSCH *Semana med* (Buenos Aires), 42 (1935), 1907 (A E M)

Cod Liver Oil Concentrate—Retention of Calcium by Infants Fed Evaporated Milk Containing Milk containing cod liver oil concentrate sufficient to allow 400 U S P units of vitamin D to the reconstituted quart, allows high retention of calcium, prevents the development of rickets and permits excellent development and growth of infants —P C JEANS and GENEVIEVE STEARNS *Proc Soc Exptl Biol Med* 32 (1935), 1464 (A E M)

Cod Liver Oil Treatment of Wounds When crude cod liver oil is used for the treatment of second and third degree burns there is a complete healing of the wound without the trace of a scar or the usual brown pigmentation of the skin If *Staph. pyogenes aureus* is inoculated into cod liver oil and incubated for forty eight hours it will be found that the bacteria are still alive but their growth inhibited Whether the vitamin content in cod liver oil has a natural affinity for the skin and the underlying tissues it is difficult to say, but there is obviously some factor in cod liver oil which is not present in such oily dressings as liquid paraffin This "something" has the effect of much more rapid healing and the almost entire elimination of scar tissue —J P STEEL *Lancet*, 229 (1935), 290 (W H H)

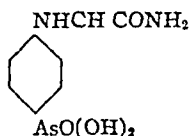
Colloidal Gold in Inoperable Cancer In order to secure maximum results with colloidal gold in the treatment of inoperable carcinoma, the following conditions must be fulfilled The preparation used must be stable, of definitely known strength and the particles of gold must be small and of fairly uniform size, the gold must not be held in suspension by the use of a stabilizer such as gum arabic or soluble gold salts such as chloride of gold Stabilizers seem to coat the particles of gold and thus renders colloidal gold less active, moreover the soluble gold salts are toxic, while pure colloidal gold is non-toxic in suitable doses A colloidal gold preparation which fulfilled the foregoing requirements and which contained $\frac{1}{1000}$ grain of metallic gold to ten drops was employed The dose used was 30 drops in a wineglass of water one half hour before each meal, three times a day This was increased one drop daily to 60 drops at each dose The intra venous dose was 1 to 5 cc, twice a week —E H OCHSNER *Clin Med Surg*, 42 (1935), 321 (W H H)

Cyclopropane Anesthesia in Obstetrics Cyclopropane is an efficient anesthetic producing analgesia for each pain, following one or two inhalations It is also powerful enough to produce complete anesthesia, even when given with a high percentage of oxygen Neither the mother nor the child is in any danger of asphyxiation with this anesthetic The uterine contractions are not interfered with, and such anesthesia does not cause vasomotor shock though it produces complete relaxation of the voluntary muscles —R T KNIGHT *Clinic Med and Surg*, 42 (1935) 433 (W H H)

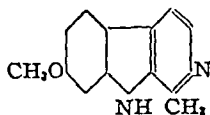
Dermatitis—Preparations for The following formulas are offered (1) Propyl *p* amino-benzoate 3%, butyl stearate 4, alcohol 7, beta naphthol 2.5, cetyl alcohol 2, olive oil 3 water 65.5 glyceryl monostearate 4, ether 9 Boil the glyceryl ester oil, cetyl alcohol, butyl ester and water Mix until the temperature drops to 30° C Dissolve the betanaphthol in alcohol, add the propyl derivative in ether and stir in, (2) Picric acid 0.5%, alcohol 7.5, water 92 Dissolve the acid in the alcohol and add to the water To make anesthetic add 5-6% of the compound, (3) *Soothing Lotion* —Salicylic acid 1.0%, menthol 0.3, rose water 95.7, alcohol 3 Dissolve the menthol in

the alcohol and the acid in the water and mix (4) Calamine 6 %, zinc oxide 2, lime water 91, camphor 0.5, phenol 0.5 Mix the camphor and phenol and allow to stand until liquefied, sift the oxide and calamine into the lime water with constant agitation and add the above mixture (5) *Antiseptic Ointment*—Ammoniated mercury 5%, boric acid 4, zinc oxide 10, oil of cade 0.5, soft white petrolatum 80.5 Melt the petrolatum, stir in the rest of the substances, cool and pass through an ointment mill (6) *Anæsthetic Oil*—Propyl *p* aminobenzoate 5%, oxyquinoline benzoate 0.2, refined sesame oil 94.3, oil of cade 0.5 Heat and mix the oils and dissolve the first two ingredients—ANON *Drug and Cosmetic Ind*, 37 (1935), 318, 326 (H M B)

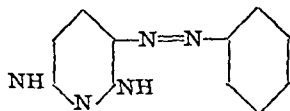
Drugs—Constitution and Action of The chemical structure of the anti syphilitic arsenicals has changed little in the last twenty years Then, as now, 3 amino-4 hydroxyarsenobenzenes were the most effective remedies Certain simpler 3 amino-4-hydroxyphenyl derivatives of arsenic have recently found favor, principally Halarsol and Mapharsen In dysentery, on the other hand pentavalent arsenicals and not trivalent, are required and compounds of the type of Tryp-



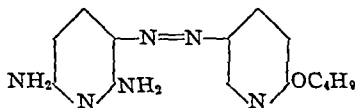
arsamide and its lower homologue, Carbarsone are employed Oil-soluble bismuth salts form deposits which are slowly absorbed, yet not so slowly as the metal itself In neurosyphilis, sodium iodobismuthate, $\text{Na} \cdot \text{BiI}_4$, dissolved in glycol is injected, and in this case the bismuth is in the anion Morgenoth in 1911, was able to show in some simple derivatives of hydroquinone that in ascending an homologous series distinct peaks of maximum antiseptic activity against different organisms were obtained As a result he produced Optochin, Eucupin and Vuzin, respectively, the ethyl, iso amyl, and iso octyl derivatives of hydrocupreine The recent work of Barger and Robinson has shown that whereas the natural alkaloid harmine,



is inactive, yet the corresponding alcohol harmol, etherified with butyl, amyl and nonyl groups yields peaks of activity against *B typhosus*, *Staphylococcus aureus* and *Entamoeba histolytica*, respectively Two urinary antiseptics of recent introduction are azo-pyridines



Pyridium



Neotropin

F L PYMAN *Pharm J*, 134 (1935), 619

(W B B)

Enteric Coatings—Comparative Study of Previous study had shown a wide variation in efficiency of coating materials Through the coöperation of several manufacturers their enteric coatings on tablets of barium sulphate were studied Five different coatings were submitted, two of keratin, one salol shellac, one shellac and a mixture of salol and resins In every case they resembled any sugar coated tablet Subjects for the experiments were normal individuals in apparent good health The X-ray was used to determine exact point of disintegration Subjects were given tablets followed at once with glass of water containing a teaspoonful of Bari O-Meal The first radio graph was taken in thirty minutes and afterward at intervals Results are tabulated according to type of coating, and tabulation shows number of tablets taken time taken and point and time of disintegration The data show about as much variation in the commercial coatings as in those prepared in the laboratory Keratin coating No 1 was completely disintegrated in the stomach in about one hour Keratin coating No 2 showed 13 tablets disintegrated in the colon, four in the small intestine and one in the stomach Point of disintegration

for seven was unknown and three were excreted. This coating then was 80.95% efficient. Shellac coating was shown to have no value for enteric medication. The salol resin mixture showed that 13 tablets disintegrated in the stomach and 22 in the intestines. Five had not disintegrated when the last picture was taken. This coating was 63.00% efficient. The salol shellac coating showed that eight tablets disintegrated in the small intestine and four in the stomach. Four capsules disintegrated in the small intestine and five in the stomach. The fate of three was not determined. Average time was 6 hours for tablets and four for capsules, percentage of efficiency being 66.66 and 14.44, respectively. None of the coatings studied was perfect. Best results seem to result with keratin properly applied. Considering absorption rate of colon less than small intestine salol mixtures seem best. Capsules are not as efficient as tablets because of mechanical difficulties.—F. S. BUKER and PHYLIS RHODIS. *J Am Pharm Assoc*, 24 (1935), 567.

(Z M C)

Ergot—Alkaloids of Ergometrine. The author recommends that ergometrine, when given for post partum hemorrhage, should be given in the following doses: by the mouth 1.0 mg, intramuscularly 0.5 mg, intravenously 0.125 mg. Fifty per cent increases above these doses have been administered without any untoward effect. As regards the clinical uses of the ergot alkaloids, the ergotoxine group is useful when a longer duration of uterine spasm is required. Ergometrine has the valuable properties of ergotoxine, but with special advantages in its remarkably quick action, particularly in the treatment of post partum hemorrhage. Ergometrine is a possible alternative to pituitary post partum, given intravenously it has actually quicker effect than an intramuscular dose of pituitary.—C. MOIR. *Pharm J* 134 (1935), 63. (W B B)

Ergotamine Tartrate (Gynergene) Ointment—Use of, in Ano-Vulvar Pruritus. The formula used was benzoated fat and lanolin of each, 12 Gm. solution of ergotamine tartrate 0.1% one cc. Cure was obtained in obstinate cases.—J. C. GONZÁLEZ PODESTÁ and ALBERTO TORDERA. *Semana med (Buenos Aires)* 42 (1935), 122. (A E M)

Forapin—Use of, in Rheumatic Diseases. Rheumatic diseases are treated with Forapin, an ointment containing bee poison by means of Iontophoresis. To increase the absorption of the bee poison 0.3% histamine is added (Ointment of Forapin with histamine).—R. SPENGLER and G. PRIEBERT. *Deut Med Wochschr* 61 (1935), 962-963. (H R)

Gold Salts—Use of, in Treatment of Pulmonary Tuberculosis. The following conclusions are given: The action of gold salts in the treatment of pulmonary tuberculosis is far from being as complete as many physicians suppose it to be. This action is not specific. Their general and inconsiderate use often leads to serious results. They are not, however, devoid of some value, their use is justified in certain well defined cases and on condition that the dosage is prescribed with caution.—GEERAERD. *Buysinghen Bruxelles Med* (June 30 1935) 953 through *J pharm Belg*, 17 (1935), 611. (S W G)

Gonococcus Vaccine—Use of, in Acute Gonorrhea. A vaccine treatment with simultaneous use of extended local rinsing was indicated for acute gonorrhea and shortened duration of illness. But this treatment was not indifferent and should be given first after the disappearance of the acute symptoms about the 9th-11th day of illness, injections being given every 3rd-5th day. Vaccine therapy during the acute symptoms makes the course of the gonorrhea worse.—MARIASSIN and BAJLEWSKIJ SOWET WESTNIK VENEROL. *Dermatol* (1935) No 4 through *Dermatol Wochschr*, 101, No 30 (1935), 931, through *Squibb Abstract Bull* 8 (1935), A-1166.

Hematoporphyrine—Use of, as a Therapeutic Agent in Psychosis. The hydrochloride of hematoporphyrine (Photodyne) was used in 37 cases of depressive psychosis. The majority of the patients showed improvement though the psychosis itself was not influenced.—EDWARD A. STRECKER, HAROLD P. PALMER and FRANCIS G. BRACELAND. *Semana Med (Buenos Aires)*, 42 (1935), 1534. (A E M)

Heroic Drugs—Maxima Doses of Galenical Preparations of. After giving the results of his study on several drugs, the author presents the following considerations. The pharmacist and doctor must know the maxima doses of the heroic drugs and the preparations made from them. A simpler dose relationship is advocated and the following is offered: 1. The strength in active principles of a tincture corresponds to one-tenth of the strength in active principles of the powdered drug. 2. The strength in active principles of the extract should be double that of the powder. The fixing of the strength of powdered heroic drugs at 0.5% in active principles is also urged. The

maxima doses of the eleven heroic drugs and their preparations are presented in a table (XIII) — ZUNZ *Bull Academie*, No 4 (1935), through *J pharm Belg*, 17 (1935), 553 (S W G)

Histidine Monohydrochloride—Value of, in the Treatment of Peptic Ulcer Over a period of four months, the histidine monohydrochloride (Irostitin) treatment has been applied to twenty six cases, twenty four of duodenal ulcer, one marginal ulcer and one gastric ulcer. Marked diminution of acidity almost to the point of anacidity occurred in one quarter of the cases. Pain is alleviated in comparatively short time. There is a definite gain in weight and patients are able to tolerate a liberal diet —H A RAFSKY *Med Record*, 142 (1935), 289 (W H H)

Insulin Treatment of Menorrhagia and Metrorrhagia The author summarizes the favorable results of others, and describes his own, from insulin treatment of excessive uterine bleeding. His best results were obtained in menorrhagia in young subjects, in whom not infrequently the intermenstrual interval could be increased from about two to four weeks, and the duration of bleeding reduced one half, and in continuous profuse bleedings of metropathia hamorrhagica of puberty. Functional bleedings in older subjects were less constantly responsive to insulin treatment. As a special feature of his treatment the author recommends "prophylactic," intermittent insulin injections, beginning five days before the date of expected menstruation, carried on until the delayed bleeding begins, and then suspended. The initial dose may begin with 10 units twice daily, increasing to 20 or 30 units, a low blood sugar level calls for smaller doses. Sugar and starches are given in considerable amounts. Simultaneous administration of ergot, which increases insulin sensitiveness, is contraindicated —E KLAFTEN *Zentralbl f Gynäk* (June 29, 1935) 1512, through *Brit Med J*, 3901 (1935), 710C (W H H)

Ipecac—Brief Study of The physiological action, indications and antidotes for ipecac, and the drugs which follow it well, are discussed. Its action is compared with that of antimony tartrate —H FARRINGTON *J Am Inst Homeopathy*, 28 (1935), 404, through *Squibb Abstr Bull* 8 (1935), A-1003

Lipiodol—Use of, as a Therapeutic Agent The value of lipiodol in diagnosis is now well recognized, but its beneficial effect on certain inflammatory conditions may not be generally appreciated. Two cases of localized chronic inflammatory meningitis are reported, both having a certain amount of paresis with loss of control of rectal and bladder sphincters. In both of them, lipiodol was injected into *cisterna magna* primarily for diagnostic purposes, and in both of them the symptoms were alleviated in an almost miraculous way, with complete cure later —G HARROWER *Lancet*, 229 (1935) 715 (W H H)

Lysates The designation lysate is derived from lysis which signifies dissolution or separation. Under this designation preparations are marketed derived from various animal organs by means of fermentative dissolution or by autoclaving. According to some authors lysates represent organotherapeutic preparations, the active principles of which are products of tissue decomposition of individual organs. Each lysate consists of a dynamic and a plastic fraction. The dynamic fraction is the specific and the active one. The plastic fraction is represented essentially by polypeptids and amino acids, its function is to assure nutrition. It has been shown experimentally that many lysates are actually specific, for instance, in rabbits lysates prepared from kidney tissue always produce a nephritis while lysates prepared from other organs have absolutely no influence on the kidneys. Myolysate given subcutaneously or internally was found very useful in the treatment of various cardiac affections especially *Angina pectoris*. Testolysate, a lysate derived from testicular tissue is widely employed in the treatment of sexual neurasthenia. Ovario-lysate a lysate derived from ovarian tissue has been successfully employed in the treatment of infantilism, incomplete development of the secondary sexual traits, hypoplasia of the female genital organs, oligomenorrhea, dysmenorrhea, amenorrhea and polymenorrhea. It has also been successfully employed in the treatment of some abnormalities associated with pregnancy —A RABINOVITSCH *Soviets Pharm*, 2 (1935), 21 (A S)

Malaria—Chemotherapy of In Germany two synthetic anti malarials—plasmoquine and atebirin, have been prepared. The most important defect of quinine as an anti-malarial is its failure to prevent infection. In an investigation with quinine, atebirin and plasmoquine against infections of malignant tertian malaria all the controls who took no prophylactic drug and all those who took quinine as a prophylactic had their attack of malignant tertian malaria within the usual incubation period, but none of those who took atebirin or plasmoquine had any malarial attack. Other defects of quinine are (a) it is not equally effective against all species and strains

oxidation of ascorbic acid designated ferriscorbone (II) (I) and (II) were tested on experimental cancers of the rabbit's testicle Both caused periscrotal edemas that were successfully reabsorbed by allylthiobromine given intravenously (II) was less active and also caused less intense edemas Fifty % of the cases were cured and generally the cancerous condition was retarded Both products were tried clinically on some grave cases of human cancer that were either inoperable or not benefited by radiotherapy *Three cases of cancer of the tongue have been successfully treated with (I), being injected intravenously several times daily for six months* Indications and contraindications are given This technique is not to be viewed as an indication of a possible prophylaxis or preventive of cancer The mechanism of the reaction is the stimulation of the fermentation processes resulting from the reversible systems of oxidation and reduction—FERNAND ORLOING, ALBERT MORIL and ANDRE JOSSLRAND *Compt rend*, 201 (1935), 456

(G W H)

Sphagnum and Its Therapeutic Use 1 Sphagnum should be employed as material for dressing It is easily obtainable in Russia and its resources are inexhaustible 2 It possesses hygroscopic and capillary properties and when sterilized it can be applied directly to the wound just as sterile cotton 3 It should be moistened somewhat before use since when dry its adsorbing properties are decreased considerably 4 Sphagnum may also be employed as a splint padding because it is light soft and elastic 5 It may also be used for filling mattresses and cushions for children 6 It is best packed for shipping in packages of 10-20 Kg after it has been compressed For shipping to distant places it should be packed in larger bales The quality of sphagnum should be controlled by analytical studies in the laboratories or pharmaceutical dispensaries—F I IVANOV *Soviets Pharm* 2 (1935) 9 (A S)

Staphylococcal Affections—Specific Treatment of The authors have employed a staphylococcal anatoxin with marked success in certain staphylococcal infections (furunculosis acne abscess, etc) This anatoxin, prepared similarly to diphtheritic anatoxin is non toxic, and possesses an intrinsic antigenic property with the production of a specific antitoxin and immunity It should possess a high antigenic power and be administered in sufficient doses The authors usually give, at intervals of five days, three successive subcutaneous injections of 0.5 1 and 2 cc of undiluted anatoxin Patients tolerate this treatment well a slight transient fever may occur some hours after the injections, but focal reactions are rare—G RAMON *et al Presse Med* (July 17, 1935), 1137 through *Brit Med J* 3901 (1935) 710B (W H H)

Sulphurated Oil As sulphurated oil Loeper and his collaborators have used mainly the following formula Flowers of sulphur 0.5 (1.0 Gm) and oil of sesame 100 cc Solution occurs slowly on a boiling water-bath and the product is stable Each cc contains 0.005 mg (or 0.01 cg) of flowers of sulphur The intramuscular injections in chronic rheumatism are 2 cc every two or three days Although the injections are painful and they raise the temperature of the patient to 39° or even 40° the results are interesting suppleness increasing mobility becoming greater, and, after some time diminution of the pain to a point permitting the suppression of sedatives On the other hand, Michaux and Mollaret have injected the sulphurated oil of sesame into paralytics, and here also improvements have been noted—UNION PHARMAC (July 1935), 194 through *J pharm Belg*, 17 (1935) 670 (S W G)

Suprarenal Gland—Treatment of Whooping-Cough with O Balfour (*Arch Pediat* (March 1935), 143) has treated 192 cases of whooping cough with desiccated whole suprarenal gland Fifty six required no further treatment, thirty eight were given thyroid, fifty eight non specific proteins forty pertussis vaccines in addition when the suprarenal substance alone did not control the cough He recommends whole suprarenal gland The results obtained with non specific proteins and commercial vaccines were equally good and superior to those following thyroid gland—*Brit Med J*, 1 (1935), 48C (W H H)

Tannic and Picric Acid in Burns Modern treatment of burns embraces the following (1) relief of pain (2) protection of the denuded areas (3) application of antiseptics to prevent or combat infection, (4) promotion of healing and repair, (5) combating the shock and fluid deprivation (6) prevention and treatment of toxemia, (7) prevention of contractures and (8) replacement of tissue by grafting The least troublesome and most comfortable wet dressing for burns of a limited degree and area is a 1% solution of picric acid because of its protective, antiseptic astringent and analgesic properties, it stimulates the reproduction of epithelium its stains are readily removed by applying powdered potassium sulphate for a minute and then washing with soap

or by a paste of magnesium carbonate. The use of a stronger solution increases the danger of poisoning. Tannic acid also has the above properties, brings about the coagulation of devitalized tissue for burned area and by the formation of a tanned crust protects the surface and relieves pain. B offers the following formula for an ointment for mild burns of limited area: Tannic acid 5%, picric acid 0.5%, benzocaine 2% and ointment base. A cooling effect may be obtained by the addition of menthol and increased thickness by adding zinc oxide or starch.—R. RICHARD BLISS, JR. *Drug and Cosmetic Ind.*, 37 (1935), 177, 184 (H M B)

Termopsis—Use of, as an Expectorant. Recent studies have shown that *Termopsis lanceolata* can be used as an expectorant. This plant has been used empirically by the laity for the treatment of influenza, bronchitis, pneumonia, etc. From the plant proper and from the seeds of termopsis two alkaloids have been obtained: termopsine which is easily crystallized and a liquid termopsidine. The former alkaloid is chemically analogous to other active principles found in various plants belonging to the family leguminosa, for instance, lupanine, metrine, retamine, etc. Experimental studies carried out on frogs, mice, rats, rabbits, cats and dogs have shown that the infusions and extracts obtained from the termopsis plant, as well as the crystalline products obtained from this plant, act chiefly on the medulla oblongata and cerebrum, especially on the respiratory, vaso motor and vomiting centers. Depending on the dose this action is either tonic or stimulating, or depressing and paralyzing. The vomiting observed in cats and dogs is not only of a central, but also of a peripheral origin, that is, it acts not only on the vomiting center directly, but reflexly on the mucosa of the stomach. The direct and reflex action of small doses of termopsis on the vomiting center leads to an increased secretion of the mucosa of the respiratory tract, and acts as an expectorant. On the basis of the studies outlined above one may recommend this substance as a good expectorant and best results are obtained from an infusion given in doses of one tablespoon three times a day.—N V VERSHININ *Soviets Pharm.*, 4 (1935), 29-31 (A S)

Thiobarbiturates. A series of thiobarbiturates has been prepared by condensing derivatives of malonic ester with thiourea. Previous work had shown that the administration of 120 mg/Kg of the sulphur analogue of 5,5 diethyl barbituric acid (barbital) to dogs produced sleep followed by death. The authors studied a number of thiobarbiturates and found that they showed promise as sedatives. They produced quiet, natural sleep and were free from side actions and from the after-effects observed following the use of their oxygen analogues. The work is being continued and will be reported in detail.—ELLIS MILLER, JAMES C MUNCH and FRANK S CROSSLEY *Science*, 81 (1935), 615, No 2112, through *Squibb Abstracts Bull.* 8 (1935), A-876

Thyrotoxicosis—Action of Iodine in. The role of iodine in the physiology of the thyroids is discussed from theoretical aspects. A study of approximately 575 clinical cases of thyrotoxicosis showed that the administration of iodine to thyrotoxic patients produced a characteristic and specific response which consisted of an amelioration of symptoms and a decline in metabolic rate, and that this response to iodine therapy would occur at any stage of the disease. It appeared, however, that the response had no relation to the duration or direction of progress of the disease, but merely acted as a check on the intensity of its symptoms. These clinical facts were concluded to be consistent with the theory that in thyrotoxicosis the thyroid allows the escape of thyroxine to proceed at an excessive rate, and that the cells of the thyroid hyperfunctioned in consequence. It was suggested that iodine sets up a temporary obstacle to this excessive outflow by checking the leakage of thyroxine from the gland. The authors believe that so called refractoriness is apparent, not real, that thyrotoxic patients who are unaffected by iodine are those who are already fully iodimized. They believe that iodine response is valuable in the management of toxic goiter, both in treatment and in diagnosis, but its fundamental nature must be familiar if it is to be used successfully. The type of iodine preparation administered is unimportant.—J H MEANS and JACOB LERMAN *J Am Med Assoc.*, 104 (1935), 969 (M R THOMPSON)

Trichophytosis. This form of dermatoses—also "Epidermophytosis"—is commonly known as Athlete's Foot, Gym Itch, Athlete's Foot Itch, Jockey Strap Itch, Ringworm of the Foot, Dhotie Itch, etc., is caused by a parasitic fungi and occurs in several forms: (1) *vesicular*, characterized by the formation of little blisters, (2) *scaling*, both occurring on the toes, soles, fingers and palms, (3) *macular*. (a) "*Eczema marginatum*" or "Jockey Strap Itch" red definitely margined lesions in the groin region, axillae and beneath the breasts and (b) "*Tinea circinata*," slightly elevated, ring-like patches on neck, face and hands referred to as ringworm on the body, (4) *macerated*, lesions between the toes as an area of clean white sodden tissue of varying degree

of thickness The following dermat therapeutic agents are listed in order of their descending irritant action chrysarobin, pyrogallol, mercury bichloride, ammoniated mercury, mercurial ointment, iodine, tar, phenol, ichthyol, sulphur, resorcinol, chlorothymol, salicylic acid benzoic acid and boric acid The following formulas are offered (1) *Deek's* Salicylic acid 8%, ammoniated mercury 4, bismuth subnitrate 12 oil eucalyptus 12 hydrous wool fat 64 (2) salicylic acid 5% benzoic acid 5, chlorothymol 2, propyl *p* aminobenzoate 5% or benzocaine 10%, vanishing cream base, (3) *Prophylatic Powder*—Powdered sodium thiosulphate 20%, powdered boric acid 50, purified talc (sterilized) 30%—A RICHARD BLISS JR *Drug and Cosmetic Ind*, 37 (1935) 313-314

(H M B)

A Urinary Antiseptic A new urinary antiseptic picochrome" was found to act equally well in acid and alkaline urines and that it destroyed coliform bacilli as well as cocci It is potent in high dilutions and is tolerated orally, intravenously or locally The only drawbacks are diarrhoea occasionally, and red discoloration of the urine The drug is a derivative of orthocresyl, and contains a new radical called diaminopicocoline—A RAVICH *Med Record*, 142 (April 3 1935) 343, through *Brit Med J*, 3893 (1935), 326C

(W H H)

Vincent's Angina—Preliminary Evaluation of a Solution of Cerous-ceric Chromate in the Treatment of, and Other Oral Diseases Cerous ceric chromate (I) seems to offer a powerful oxidizing agent to the dental profession for the treatment of Vincent's infection It does not have a persistent stain, is not disagreeable in taste and has no odor I is prepared by combining at high temperature ceric oxide and chromic acid The resulting mixture is apparently equal percentages of ceric and cerous chromates I has been found particularly efficient in combating chronic and acute forms of Vincent's infection especially in the fusiform stage Two cases, 1 acute and 1 chronic of 4 year's duration are reported The disadvantages of the oxidizing agents hydrogen peroxide, perborates, potassium permanganate, mercury salts and chromic acid are discussed—D C LYONS and O T COFFELT *Dental Digest* 41 (1935), 201, through *Squirrb Abstr Bull*, 8 (1935), A-1018

Vinethin—New Hypnotic Vinethin is characterized by its production of quiet sleep and freedom from production of undesirable side actions—E W DORFFEL *Deut Med Wochschr*, 61 (1935), 955-957

(H R)

Vitamins A and D and Camphor Oil—Use of, in the Treatment of Burns Local application of 7% camphor oil combined with vitamin A and D given by mouth cause quick disappearance of toxic symptoms produced by burns—CARLOS O FRANZETTI *Semana med* (Buenos Aires), 42 II (1935), 998

(A E M)

NEW REMEDIES

SYNTHETICS

Apothyrin Dragees (Dr Wander G m b H, Vienna) contain 0.05 Gm duodithyrosin per tablet in packages of 30 dragees—*Pharm Post*, 68 (1935) 388

(H M B)

Azochloramid (Wallace and Tiernan Products Belleville, N J) is N,N' dichloroazodicarbonamid and an effective stable chlorine germicide for therapeutic use and is recommended for dressing packing or irrigating infected wounds and cavities—*Drug and Cosmetic Ind*, 37 (1935), 127

(H M B)

Dibroluur (Soc Chem Ind Katwijk, Netherlands) is bromodiethylacetylurea in 0.5-Gm tablets—*Drug and Cosmetic Ind*, 37 (1935), 127

(H M B)

Isopur Tablets (F J Kwizda, Korneuburg) are marketed in packages of 10 tablets of 0.15 Gm dioxyanthraquinone—*Pharm Post*, 68 (1935), 388

(H M B)

Natriphene (Natriphene Co, Detroit) is a white crystalline powder, sodium 2 hydroxydi phenyl with a phenol coefficient of 17 $\frac{1}{16}$ as toxic as phenol, soluble in water, alcohol and acetone and is used as a disinfectant, antiseptic, fungicide and deodorant—*Drug and Cosmetic Ind*, 37 (1935), 127

(H M B)

Neonal Sodium (Abbott Laboratories) is the sodium salt of butyl ethyl barbituric acid, and is claimed to be about three times as active as barbital—*Drug and Cosmetic Ind*, 37 (1935), 263

(H M B)

Phenyl Aspirodine (W Martindale London) is acetyl iodosalol and is recommended for use as an intestinal and urinary antiseptic—*Drug and Cosmetic Ind*, 37 (1935), 263

(H M B)

Rosidol (Leopold Laseyron, Paris) is 2,6 dimethyl octen(2)ol (8) — *Riechstoff-Ind Kosmetik*, 10 (1935), 160 (H M B)

SPECIALTIES

A M O Antiseptic Solution (Boots Pure Drug Co, Nottingham) is a solution containing amyl-*m* cresol for a mouthwash dental antiseptic or gargle — *Drug and Cosmetic Ind*, 37 (1935), 127 (H M B)

Abszessin (Rego A G, Schwanden) are tablets containing 0.1 Gm morphine (1 Gm opium or 0.5 Gm of extract) with rice starch and cocoa powder — *Pharm Monatsh*, 16 (1935), 135 (H M B)

Adol Potion (Adol Laboratory, Lyon) contains ammonium bromide 5 Gm, pyramidon 3 Gm, caffeine citrate 0.15 Gm, ammonium iodide 0.5 Gm, sparteine sulphate 0.1 Gm, extract of valerian 0.8 Gm, excipient to form a liqueur 20 Gm. One to 5 dessertspoonfuls are taken per day to combat pain — *Bull Ch Synd Pharm Seine* (July 1935), through *J pharm Belg*, 17 (1935), 710 (S W G)

Ambinon (Organon, Ltd Netherlands) is a purified extract of the anterior lobe of the pituitary body of which it contains the active constituents. The thyrotrope hormone of the anterior lobe of the pituitary body stimulates the activity of the thyroid gland which is coupled with an increase in elementary changes and with the iodine content of the blood. For standardization of the guinea pig unit, half of the daily dose which if injected intraperitoneally in young guinea pigs (150–200 Gm) reaches or exceeds a fixed epithelial development of the thyroid gland is selected. This unit is about equal to the Junkmann and Schoelker unit, although the latter is somewhat less sharply defined. Each ampul of Ambinon contains 25 guinea-pig units of thyrotrope hormone. The gonadotrope hormone of the anterior lobe of the pituitary body possesses a strongly stimulating action on the ovary. It promotes ripening of the follicles and the development of the corpus luteum. Recent research seems to show that the ripening of the follicles is caused by two components of the gonadotrope hormone, both of which are present in Ambinon. Each ampul of Ambinon contains 5 rat units of gonadotrope hormone. Still another important property of the gonadotrope hormone is that it increases the action of the gonadotrope hormone of the urine of pregnant women (pregnyl). In order to facilitate the simultaneous administration of ambion and pregnyl, the ambion ampuls are packed with an equal number of pregnyl ampuls. The latter is in powdered form which is put into solution for use, since the solution is unstable and has poor keeping qualities. Among other things Ambion is employed in habitual abortion, infantile and primary amenorrhoea, in insufficient development of the testes and in disturbances of the thyroid function or of metabolism. In general, one is directed to inject one ampul every day or every other day, usually not combined with pregnyl — *Pharm Weekblad*, 72 (1935), 1040 (E H W)

Amos Throat Water (Dr O Seiderer, Germania Apothecary, Dresden) is a solution of aluminum chloride with the addition of perhydrol used in throat inflammations, gripes, etc — *Pharm Monatshefte*, 16 (1935), 135 (H M B)

Antagosin (Behringwerke, I G Farbenindustrie A G, Leverkusen a Rh) is a lactic acid bacterial preparation for local inflammatory treatment due to developed bacterial infection. The preparation contains antagonistic acting lactic acid bacteria which due to its biological activity hinders the growth of pathogenic bacteria. The preparation is simultaneously used for disinfection and astringency, but rinsing must be unconditionally avoided to prevent any antagonistic action. The preparation is marketed in sealed dark bottles which are shaken before use and stored in a cool place — *Pharm Zentrallh*, 76 (1935) 536 (E V S)

Antetestin (Gedeon Richter, London) is a combination of gonadotropic hormone and testicular extract sold as tablets or ampuls with a dose of 1–2 tablets 3 times a day or 1 intramuscular injection — *Drug and Cosmetic Ind*, 37 (1935), 263 (H M B)

Anthesin (Sandoz Chemical Works), the N diethyl leucinol ester of *p* aminobenzoic acid, is a local anesthetic and is used for infiltration anesthesia and spinal anesthesia in conjunction with adrenalin solution — *Drug and Cosmetic Ind*, 37 (1935), 263 (H M B)

Anthrex Suppositories (Sagitta Works G m b H, Munich) against gout, rheumatism, and arthritis, contain Investin (a molecular combination of diethylbarbituric acid, amidophenazon, phenacetin and caffeine citrate) and phenylquinolincarbonic acid — *Pharm Monatshefte*, 16 (1935), 135 (H M B)

Argyrophedrine (Aron Suresnes) contains ephedrine hydrochloride 0.3 Gm, Argrol Barnes 0.3 Gm, physiologic serum 30 cc. It is used as a nasal spray or in the form of drops—*Bull Ch Synd Pharm Seine* (May 1935), through *J pharm Belg*, 17 (1935) 572 (S W G)

Arthrorheumin (Kaiserdaam Apothecary, Charlottenburg) occurs in ampuls with the following composition: Formic acid 0.001 Gm, silicic acid anhydride 0.0001 Gm, phosphorous 0.0000166 Gm, arsenic 0.0000166 Gm, strychnine 0.0000125 Gm, water *q s* to 1 Gm and is used for gout, chronic muscular rheumatism, lumbago, etc.—*Pharm Monatsh*, 16 (1935), 135

(H M B)

Azoule Calcium L-B (Allen and Hanburys, London) is a solution of calcium lactobionate for the parental administration of calcium in tetany, etc.—*Drug and Cosmetic Ind*, 37 (1935), 127

(H M B)

Binæmon (Organon Ltd) consists of liver powder and powdered hog stomach. It is a preparation containing anti-anemic factors of liver and hog stomach. The intrinsic factor of Castle as well as the extrinsic factor shown by recent researches that the mucous membrane of the stomach should be combined with liver, are present in this preparation. The patient can take Binæmon at meal time. Ten-15 grams are sufficient in most cases to regenerate the blood. Clinical research must still show the value of this preparation in convalescence. It has already been shown that patients who have returned to a normal blood count with liver injections, have with this preparation retained the erythrocyte count and patients seriously ill have had an increase in red blood corpuscles—*Pharm Weekblad*, 72 (1935) 1041

(E H W)

Borhamyl (H. Martinet, Paris) consists of salicylic acid 0.1 Gm, boric acid 5 Gm, concentrated distillate of *Hamamelis virg* 50 Gm, distillate of plantain 50 Gm, distillate of melilot 50 Gm, distilled water enough to make 250 Gm. The solution is isotonic with the tears and may be used as an eyewash—*Bull Ch Synd Pharm Seine* (May 1935) through *J pharm Belg*, 17 (1935), 572

(S W G)

Calbrolact (Chas. Zimmermann and Co., London) is a combination of calcium bromide (33%) and calcium lactate (66%) with a dose of 2-6 tablets daily—*Drug and Cosmetic Ind*, 37 (1935), 263

(H M B)

Camphochin (Karl May, Besch Pharmaceutica G m b H, Berlin Wilmersdorf) is a sterile ethereal oil solution containing 3% of basic quinine and 2.5% of camphor. It is used as a painless intramuscular or intragluteal injection in bronchopneumonia, bronchiectasis, etc.—*Pharm Zentralh*, 76 (1935), 553

(E V S)

Canfidrol Ampuls (Laboratory Farmacol Reggiano, Corregio, Italy) contain calcium camphosulphonate and ephedrine hydrochloride in packages of 6 × 1 cc and 3 × 5 cc ampuls and as packages of 15 cc of solution—*Pharm Post*, 68 (1935) 327

(H M B)

Certosed (Sagitta-Werk G m b H, München) is prepared from the extracts of valerian, viscum and opium, tincture of strophanthus and chloral hydrate. It is used as a sedative and hypnotic for nervous disorders and worries, especially for heart neurotics—*Pharm Zentralh*, 76 (1935), 460

(E V S)

Cholotonon (Chem. Fabrik Promonta G m b H, Hamburg 26) is prepared from an extract of the liver and gall bladder systems. It is marketed only in ampuls and used in disorders of the liver and in the gall bladder ducts—*Pharm Zentralh*, 76 (1935), 430

(E V S)

Clabin (Sagitta-Werk G m b H, München), a corn and callous remedy is a combination of salicylic collodion, resorcinol collodion and salicylic acid—*Pharm Zentralh*, 76 (1935), 536

(E V S)

Codalgin (S. Ballin, Frankfurt a. M.) tablets contain in each: codeine phosphate (0.01 Gm), caffeine (0.05 Gm), phenacetin (0.25 Gm) and phenyldimethylpyrazolone (0.25 Gm). It is used for gripe, migraine, head and toothaches, and rheumatism—*Pharm Zentralh*, 76 (1935) 460

(E V S)

Corron Tablets (Abbott Laboratories) are a convenient source of iron and copper and are recommended for preventing nutritional and secondary anemias—*Drug and Cosmetic Ind*, 37 (1935), 263

(H M B)

Cortical Fluid (Fa. Istituto Opoterapico, Pisa) is the aqueous extract of fresh suprarenal cortical substance in packages of 40 cc and ampuls in packages of 6 × 2 cc—*Pharm Post*, 68 (1935), 327

(H M B)

Cortidyn (Chem. Fabrik Promonta G m b H, Hamburg) is a standardized kidney extract

prepared by a special process from the suprarenal cortex of freshly killed animals. One cc of the extract contains 5 corticodynamic mouse units. A mouse unit dose of the extract will cause an increase in weight of a young desuprarenalized mouse from 9 to 11 Gm in seven days and the animals should be alive in 80% of the test cases eight days after the operation. It is used intramuscularly or subcutaneously in Addison's disease, Basedow's disease, infectious diseases and psoriasis —*Pharm Zentralh*, 76 (1935), 554 (E V S)

Cumasina Preparations (Angelini Werke G m b H, Leipzig), based on the system of silver antiseptics and chlorine disinfection of Kruse Fischer, contain oligodynamic bactericides due to the finely distributed and effectively activated non poisonous Cumasina silver obtained by an electric current. *Cumasina liquid* is used for instillations, spraying, inhalations, gargling, wounds or ulcers, abscesses, mucous membranes, etc., *Cumasina liquid forte* for gonorrhea, *Cumasina liquid angina* for the treatment of angina, *Cumasina powdered I* for dishydrosis and hyperhydrosis, *II* for *pruritus semilis*, *III* for eczema and burns *IV* for ulcers and abscesses of various types or stomatitis, *Cumasina ointment* for frost-bite and burns of all forms, *Strong Cumasina ointment* for the treatment of *ulcus cruris*, *Cumangin troches* for angina and inflammable conditions of the mouth and throat, *Cumadiph tablets* for diphtheria, *Cumacarro tablets* for intestinal infections, enteritis typhus and dysentery, and *Cumanellen* as a prophylactic for mouth, throat and larynx disinfection —*Pharm Zentralh*, 76 (1935), 554 (E V S)

Curacne Tin Compound Tablets (Cooper Laboratory, Watford, Herts) consists of tin oxide and metallic tin in a suitable base for the treatment of staphylococcal diseases —*Drug and Cosmetic Ind*, 37 (1935), 127 (H M B)

Darmo-Stop Tablets (Lab Farmacol Reggiano, Corregio, Italy) in packages of two tablets contain 0.50 Gm basic calcium aluminum tannate in chocolate —*Pharm Post*, 68 (1935) 327 (H M B)

Davitamon A-D (Organon Ltd) is now obtainable in vials (dragees) each vial containing 1500 International Vitamin A units and 1000 International Vitamin D units. The only solution contains 5000 International Vitamin D units and 6000 International Vitamin A units per cc and corresponds to about 5 dragees in Vitamin D content. The new form should be attractive for children's use and has the advantage of eliminating the loss incurred by dropping from the bottle. It is found on the market in boxes of 24 and flasks of 100 —*Pharm Weekblad*, 72 (1935), 1041 (E H W)

Dermichthol (Ichthyol Company) contains *Leukichthol* with phenol, salicylic acid, terpenes and *Unguentum Basilicum*. It is used in pyodermitis, abscesses of the sweat glands, phlegmones etc —*Pharm Weekblad*, 72 (1935), 1041 (E H W)

Digilanid (Sandoz, Basel) contains the active crystalline constituents from *Digitalis lanata* recently described by Stoll and Kreis. It contains three glucosides from this digitalis species. According to Rothlin it may be considered as a crystalline infusion of digitalis in which the active constituents appear in unaltered form. It is found upon the market in 0.5% solution, in tablets containing 0.25 mg of glucosides and in suppositories with 0.5 mg. According to experiences at the University clinic at Leipzig, it gives satisfactory results in cases for which in the past a combination of strophanthin and salyrgan had been used —*Pharm Weekblad*, 72 (1935), 1041 (E H W)

Duroxyl Tablets (Kronik and Edels, Vienna) in packages of 10 tablets to 1 Gm consists of hydrogen peroxide in solid form (carbamide + 30% H₂O₂) —*Pharm Post*, 68 (1935), 387 (H M B)

Dysmenural is a combination of Uzara and phenyldimethylpyrazolon. It is found on the market in tubes of 10 tablets each weighing 0.7 Gm. It is used to diminish labor pain, and in spastic dysmenorrhoea. The dose is 1 tablet three times a day —*Pharm Weekblad*, 72 (1935), 1042 (E H W)

Eciphun is the name given by Nourypharma Ltd (Deventer) to ephedrine hydrochloride. It is placed on the market by this firm in tablets containing 0.05 Gm of the alkaloid and in ampuls containing 1 cc of a 5% solution —*Pharm Weekblad*, 72 (1935), 1042 (E H W)

Eciphun-Hæststroop (Nourypharma Ltd) is a thyme syrup containing 2.5 mg of Eciphun (ephedrine hydrochloride) per cc. The syrup is given in by teaspoon and is used in whooping-cough, and to reduce the cough stimulus in coughs due to colds —*Pharm Weekblad*, 72 (1935) 1042 (E H W)

Eciphin-Neusglei (Nourypharma Ltd) is a nasal ointment (jelly) which contains ephedrine menthol and eucalyptol. It is put up in tin tubes having a nozzle to facilitate the application of the jelly in the nasal cavity. It is used for head colds.—*Pharm Weekblad*, 72 (1935), 1042 (E H W)

Emenagon (Chem pharm Fabrik Progrede G m b H Köln) contains the extracts of *Pareira brava*, petroselinum and cascara, *Crocus elect*, senna leaves, myrrh and iron lactate. It is indicated in amenorrhea, dysmenorrhea, and menstrual and climacteric complaints.—*Pharm Zentralh*, 76 (1935), 460 (E V S)

Epokan Merck contains in each tablet or ampul 0.03 Gm of pyrazine carbonylhydrazide, 0.03 Gm of 1-ephedrine cumarin carbonate, and 0.0002 Gm of pseudotropine benzoic hydrochloride. It is indicated for use in asthma and other asthmatic conditions. The dose is 2-3 tablets or 1-2 ampuls subcutaneously or intravenously depending upon the severity of the case.—*Pharm Zentralh*, 76 (1935), 554 (E V S)

Eroxan-Noury (Nourypharma, Ltd) is a 25% magnesium peroxide identical with similar products found on the market. It is prescribed in 1-2 teaspoonful doses for stomach disturbances.—*Pharm Weekblad*, 72 (1935), 1042 (E H W)

Eurysin (Hamburger Serumwerk G m b H, Hamburg 39), a preparation useful in non-specific immunity therapy, contains the albuminoid and lipid substances of apathogenic bacteria made soluble by a special ferment. The preparation is intramuscularly or suitably intra-gluteally injected for grippe, pneumonia, sepsis, erysipelas or furunculosis.—*Pharm Zentralh*, 76 (1935), 536 (E V S)

Ferfersan (Dr Oehren & Co, chem pharm Laboratorium, Berlin) is an iron and calcium combination with a fish liver extract which has been specially prepared from the blubber-free portion of the fish liver. It is used in cases of anemias, chlorosis, scrofulosis, rickets, etc.—*Pharm Zentralh*, 76 (1935), 554 (E V S)

Folinerin (Schering Kahlbaum) is a glucoside obtained from the leaves of *Neris Oleandri*. This glucoside crystallizes from dilute alcoholic solution in prisms. It rotates the plane of polarized light to the left, has a molecular weight of 522 and a possible formula $C_{39}H_{46}O_8$. It acts in the same way as digitoxin, although the action is of longer duration and it does not possess the cumulative action of digitalis. The cat unit according to Hatcher-Magnus is 0.24 mg per Kg and by intravenous injection 0.12 mg. One mg corresponds to about 1200 frog units.—*Pharm Weekblad*, 72 (1935), 1042 (E H W)

Gonacrine Ampuls (Dr Fritz Zuckerhandl Vienna) is marketed in packages of 3 ampuls of 5 cc of 2% aqueous solution of 3,6-diamino-10-methylacridin hydrochloride or 6 ampuls of 5 cc of 0.50% solution.—*Pharm Post*, 68 (1935), 387 (H M B)

Grumonal (Sagitta Werk G m b H, München) is a specially prepared tasteless and odorless castor oil.—*Pharm Zentralh*, 76 (1935), 460 (E V S)

Gymichtol (Ichthyolgesellschaft, Cordes Hermann & Co Hamburg) is a tampon solution containing antipyrine, potassium iodide, glycerin and Leukichthol.—*Pharm Weekblad*, 72 (1935), 1042 (E H W)

Hédéryl (Lettry Laboratories Paris) consists of fluid extract of ivy 10 Gm, essence of organum 20 drops in 100 Gm. It is applied with friction against cellulitis.—*Bull Ch Synd Pharm Seine* (July 1935), through *J Pharm Belg*, 17 (1935), 710 (S W G)

Hepastab (Boots Pure Drug Co, Nottingham) is a concentrated sterile solution of the anti-anemic factor of mammalian liver used for pernicious anemia.—*Drug and Cosmetic Ind*, 37 (1935), 127 (H M B)

Hepatopson forte (Chem Fabrik Promonta G m b H, Hamburg) is a highly concentrated liver extract suitable for intramuscular injection. Two cc of the preparation has the equivalent effect as 5 Kg of fresh liver taken orally. It is used in severe cases of Biermer's anemia.—*Pharm Zentralh*, 76 (1935), 554 (E V S)

Hepatose (Chemische Werke, Pirmasens) contains the active principles of the liver and gastric tract. It is indicated for use in anemias and disorders of the stomach, liver and gall bladder.—*Pharm Zentralh*, 76 (1935), 430 (E V S)

Hormotone (G W Carnrich Co) is a combination of the tonic hormones of thyroid, pituitary, suprarenal and gonads and is used for neurasthenia, etc.—*Drug and Cosmetic Ind*, 37 (1935), 127 (H M B)

Hypotan (Anglo French Drug Co, London) contains the bromide salts of synthetic choline derivatives with chloral and is used as a vasodilator for the relief of arterial spasms—*Drug and Cosmetic Ind*, 37 (1935), 127 (H M B)

Incretone (G W Carrich Co) is a bitter tonic—*Drug and Cosmetic Ind*, 37 (1935), 127 (H M B)

Iod-Turipol (Drs R and O Weil, Frankfurt) is composed of Turipol (terpene and pinene containing paraffin oil) and 6% iodine in organic combination is used in the nose by means of a special dropping pipette for chronic atrophic catarrh of the nose and throat—*Pharm Monatshefte*, 16 (1935), 136 (H M B)

Kitano (Kitano Co, London) consists of ammonium sulphocithiolyate 2 parts, zinc hydroxycarbonate 6, adeps lanæ 6, flores zinci 24, liniment calcis 66 and is used for the treatment of skin disorders—*Drug and Cosmetic Ind*, 37 (1935), 127 (H M B)

Kurabo (Eupharma, Passau) is an analgesic and antipyretic in the form of tablets which contain acetanilid 0.10 Gm, dimethylamidoantipyrin 0.10 Gm, caffeine 0.05 Gm, phenacetin 0.25 Gm per tablet—*Pharm Monatshefte*, 16 (1935), 137 (H M B)

Kynerval (Kyffhäuser Laboratorium Bad Frankenhausen), a nerve sedative, contains calcium bromate, extract of valerian, humulus, frangula, peppermint, iron citrate and carrot—*Pharm Zentralh*, 76 (1935), 460 (E V S)

L P C Proderma Soap (Deutsche Lupocid Gesellschaft Meiner and Peter Karlsruhe (Baden)), for eczema, contains as active ingredients lecithin and chlorocavacrol—*Pharm Zentralh*, 76 (1935), 536 (E V S)

Laccodermes (Lab Brisson) is a water soluble "semi fatty" varnish of which the excipient is an ointment of casein. It forms a supple, elastic and resistant coating on the epidermis, and may be used with dermatologic preparations—*Bull Ch Synd Pharm Seine* (May 1935), through *J pharm Belg*, 17 (1935), 572 (S W G)

Lebergranulat (Merck, Darmstadt), for diet therapy, contains the active principles of liver prepared and concentrated by a special fermentative process so that a small dose would have the same effect as the use of a large quantity of fresh liver or dried liver preparations. The small dose of the preparation is easily taken so that continual administration does not overtax the patient. It is used for Bremer's anemia and for pernicious anemias—*Pharm Zentralh*, 76 (1935), 554 (E V S)

Lecitrapp (Dr Schmidtsche Apotheke, Inhaber Otto Trapp, Tübingen) contains the purest colloidal egg lecithin sodium biphosphate, organic iron with copper as a catalyst, dextrose and plant extracts. It is marketed in liquid form, or in tablets with the addition of cola. It is used as a nerve tonic, for anemias, and as a regenerative especially for the heart, nerves, exhaustion and anemia—*Pharm Zentralh*, 76 (1935), 430 (E V S)

Leukchthol (Ichthyol Gesellschaft, Cordes Hermann & Co, Hamburg) is a new, almost colorless Ichthyol. It is almost odorless, dark in substance but light in thickness. Differences in therapeutic value are not given—*Pharm Weekblad*, 72 (1935), 1042 (E H W)

Limentum Rubbeck (United Laboratories Ludovica, Ludwig Sell, Munich) for acute and chronic articular rheumatism, neuralgia, etc., is a liniment of salicylic acid, methyl salicylate, capsin and oils of eucalyptus, salvia, mace, rosemary, juniper and camphor in solution—*Pharm Monatsh*, 16 (1935), 121 (H M B)

Lutin-salve (Togal Works of Gerhard F. Schmidt, Munich), useful against acute and chronic articular and muscular rheumatism, gout, neuralgia, etc., contains oil of turpentine, solution of amyl salicylate, acid salicylic, camphor, menthol and adeps lanæ—*Pharm Monatsh*, 16 (1935), 121 (H M B)

Lorisan (Chem-Pharm Laboratories of Eduard Lyse, Dresden) is sold as Lorisan I (mild) and Lorisan II (strong). (I) consists of anhydrous lanolin, zinc oxide, liquid petrolatum, rosemary oil, formic acid, gallic acid, arnicin, matico oil, judlandin, oil of chamomile, volatile oils and various glucosides and is used for inflammations of the skin, furunculosis or carbuncles, muscles, tendons, wounds, etc.—*Pharm Monatsh*, 16 (1935), 121 (H M B)

Luteal Ampuls (Fa Istituto Opoterapico, Pisa) is the aqueous extract of corpus luteum and is sold in packages of 6 ampuls of 1 cc—*Pharm Post*, 68 (1935), 327 (H M B)

Luteolipex (Sanabo Chinoin, Fabrik chem-pharm Präparate G m b H, Wien XII) is a corpus luteum hormone in oil solution standardized according to the method of Corner. Each 1-cc

ampul contains ten clinical units. It is used as a preventative in habitual abortion and to control the bleeding of pregnancy—*Pharm Zentralh*, 76 (1935), 460 (E V S)

Magsalyl (A Roux, Ivry sur Seine) is a physiologic solution of sodium salicylate in biologic equilibrium with the sodium calcium, potassium and magnesium ions of the blood serum. It contains sodium salicylate 0.5 Gm, magnesium chloride 0.05 Gm, magnesium hyposulphite 0.075 Gm, excipient enough to make 5 cc—*Bull Ch Synd Pharm Seine* (June 1935), through *J pharm Belg*, 17 (1935), 672 (S W G)

Map (Dr George Henning, Berlin Tempelhof) is crystallized myo adenosine phosphoric acid and is said to be useful in overcoming ischemia and anoxemia of the heart muscle, relieves spasms of the peripheral vessels and is suggested for angina pectoris and gangrene, 1-3 cc may be given by intramuscular injection daily—*Drug and Cosmetic Ind*, 37 (1935), 263 (H M B)

Mastal-liquid (Istituto Opoterapico Pisa) is the aqueous extract of fresh mammary glands in packages of 60 cc and also sold in packages of 12 ampuls holding 2 cc—*Pharm Post* 68 (1935), 327 (H M B)

Medulka Frostbite Ointment (Dr W Dernbach, Apotheker, Bad Salzschlirf) is a mixture containing camphor, larch terpentine ethyl *p* aminobenzoate, ointment of althaea and bone marrow—*Pharm Zentralh*, 76 (1935), 353 (E V S)

Menotheosan Dragees (Dr Wander G m b H Vienna) consist of 0.10 Gm bromcalcium theosan, 0.02 Gm sodium nitrite phenylethylbarbituric acid, papaverine dioxanthraquinone and ovarium in packages of 60 dragees—*Pharm Post* 68 (1935), 387 (H M B)

Mercolloid Ampuls (Biochemischen Laboratorien A G, Locarno) contains 0.01 Gm colloidal mercury sulphide and is given for luetic and paraluetic disorders especially those resistant to arsenic and bismuth and also for psoriasis—*Pharm Monatsh*, 16 (1935), 121 (H M B)

Mugantheme (Chuit Nael u Cie Genf) is a maybell perfume used for cologne waters skin creams and powders—*Reichstoff Ind Kosmetik*, 10 (1935), 160 (H M B)

Myrtazeenol Reinecke (Fabrik fur pharm Spezialiten, Homoeopathie und Biochemie G A Reinecke, Hannover), a preparation containing 80-85% of oil of eucalyptus, is used either internally or externally for rheumatism, gout, ischuria, asthma, headache or coughs—*Pharm Zentralh*, 76 (1935), 536 (E V S)

Nembutal (Abbott Laboratories) a sedative, hypnotic and antispasmodic is offered as an elixir in 4 oz and 1-pint bottles and in suppositories containing 2 grs—*Drug and Cosmetic Ind*, 37 (1935), 263 (H M B)

Nerosol C (L Gaudran u Cie Genf) is a new cheap form of nerol especially good as a perfume for cologne waters—*Reichstoff Ind Kosmetik* 10 (1935), 160 (H M B)

Nervanon (Fabrik pharm Präparate A Zwintscher, Heidelberg) contains valerian, hops, *Viscum album*, and a dilution of strophanthus (D 3). It is used for nervous disturbances of various types, and for climacteric conditions such as the pains during menstruation—*Pharm Zentralh*, 76 (1935), 537 (E V S)

Nouricalpöeder (Nourypharma Ltd, Deventer) is a mixture containing 25% calcium gluconate, 25% dry extract of malt and 50% sugar. It is a dietetic preparation which is principally used in children's porridge to promote calcium assimilation. This is brought about especially by the addition of the extract of malt. A teaspoonful is used to a dish of porridge. For the regular administration of calcium *Nourical chocoladchagelslag* and *Nourical muisjes* (both confectations) are found on the market, and serve as pleasant vehicles for children—*Pharm Weekblad*, 72 (1935), 1043 (E H W)

Nouricaltabletten (Nourypharma Ltd, Deventer) are tablets containing 1.5 Gm of calcium gluconate. They are flavored with oil of peppermint which makes the administration of the calcium preparation more pleasant—*Pharm Weekblad*, 72 (1935), 1043 (E H W)

Novalgin-Quinine (Bayer, I G Farbenindustrie Aktiengesellschaft, Leverkusen), sold as tubes of 10 dragees and containers of 100 dragees, contains 0.15 Gm of sodium phenyl dimethyl pyrazolone methyl aminomethane sulphonate and 0.1 Gm of the quinine salt of the same acid (= 0.05 Gm quinine) in each dragee. It is given by mouth 1-2 dragees 1-3 times a day for grippes, pains of all kinds, joint and muscular rheumatism and neuralgias—*Apth Ztg* 50 (1935), 496 (H M B)

Nymphosan-Peru-Gummibonbons (Nymphosan A G, Munich) contain balsam peru 1.6%, anesthesin 0.8% and sugar, and is used for colds and disorders of the air passages —*Pharm Monatsh*, 16 (1935), 121 (H M B)

Oxyascarin Tablets (Brandt and Co, Halle) is marketed in packages of 10 sticks containing 0.0075 Gm aluminum subsantoninate, triethyl diphenol ester and aluminum subacetate —*Pharm Post*, 68 (1935), 387 (H M B)

Oxykin Cream A formula is cited for a contraceptive cream recommended by Dr J H Leunbach. This is composed of oxyquinoline sulphate, 1 Gm and *Cremor ad explorationem*, 99 Gm —*Arch Pharm og Chem*, 12 (1935), 151 (C S I)

Pallida Antigen (Sächsischen Serum Works A G, Dresden) is a Pallida pure culture extract serving for the serological detection of lues —*Pharm Monatsh*, 16 (1935), 122 (H M B)

Pantigal Plugs (F. Beiersdorf and Co, Vienna) are sold in packages of 3, 6, 12 pieces, each containing 0.30 mg linadigin glucoside from digitalis linnata —*Pharm Post*, 68 (1935), 388 (H M B)

Paralact Tablets (Cooper Laboratory) consist of parathyroid and calcium lactate to be used in cases of defective calcium metabolism —*Drug and Cosmetic Ind*, 37 (1935), 127 (H M B)

Paspas (Ludpoldwerk, Munich) is a mixture of polyvalent antigen with powdered posterior lobe of pituitary body. It is used as a vaccine in the treatment of bronchial asthma. Each ampul contains 0.2 cc Paspas, the unit for one treatment. With children the quantity is cut in half. Six skin scratches are made on the upper arm with a lancet. These should be 1/2 to 3/4 cm long and about 1/2 mm deep. Some blood may appear. Two-3 drops of the Paspas is then well rubbed into the area with a glass rod and the remainder slowly added from a syringe. After drying, a bandage is applied. Ten treatments covering 12-14 days are usually used —*Pharm Weekblad*, 72 (1935), 1043 (E H W)

Pelargon (Deutsche A G für Nestle Erzeugnisse, Berlin Tempelhof) is a powdered lactic acid whole milk without the addition of carbohydrate. It is prepared from first class fresh milk obtained from cows in the Swiss Alps with the addition of 0.5% of a pure lactic acid. It is used to prepare milk for infants and children as the normal nutrient or to supplement the mother's milk, and as a dietetic food for various convalescences, eczema and vomiting —*Pharm Zentralk*, 76 (1935), 461 (E V S)

Pep-Acid-tabletten (Nourypharma, Ltd, Deventer) contain 0.4 Gm betaine hydrochloride and 0.1 Gm pepsin. They are used after meals in indigestion —*Pharm Weekblad*, 72 (1935), 1043 (E H W)

Perborat Noury (Nourypharma, Ltd, Deventer) is sodium perborate flavored with peppermint oil. It is packed in square bottles and is used in place of tooth powder, tooth paste and mouth washes. A small quantity of the preparation may be placed on the tooth brush, or may be dissolved in water —*Pharm Weekblad*, 72 (1935), 1043 (E H W)

Peremesin (von Heyden Chemical Co) is a colloidal cerium ovalate preparation used to prevent vomiting. It is used as a preventative for sea sickness and to correct the tendency toward vomiting in pregnancy. One-2 tablets —*Pharm Weekblad*, 72 (1935), 1043 (E H W)

Perinkret (Chem Fabrik Dr George Henning, Berlin Tempelhof) is a peristaltic hormone which is obtained as the neohormonal from the spleen. It is a much concentrated preparation representing in 2 cc the therapeutic action of about 20-30 cc neohormonal and is used against chronic constipation and intestinal paralysis —*Pharm Monatsh*, 16 (1935), 122 (H M B)

Pertugen Ointment (Anhaltisches Serum-Institut G m b H, Berlin-Dessau) is an aluminum chloride in a specially prepared ointment base having a high water absorbing power. The action of the preparation depends upon the liberation of nascent chlorine and oxygen, whereas the aluminum salt exerts its anti-inflammatory and antiseptic action. It is used for skin burn, frostbite, leg ulcers, hemorrhoids, etc —*Pharm Zentralk*, 76 (1935), 461 (E V S)

Pertussin Troches (E. Taeschner, chem-pharm Fabrik, Potsdam) contain as active ingredients Pertussin balsam, Extract Thyme Taeschner, ephedrine hydrochloride and extract lobelia. The troches for children contain Pertussin balsam, quinine dihydrochloride, carbamide, phenylethylbarbituric acid and a small amount of powdered extract of belladonna. They are used for pertussis, bronchitis, bronchial asthma, etc —*Pharm Zentralk*, 76 (1935), 554 (E V S)

Perviscal (C Sorger, Apotheker, Wolmirstedt, Bez Magdeburg) is prepared from fresh plants of *Viscum album*, drug extracts of celery seed, *Auriculus muris*, adonis and homeopathic doses of vanadium chloride and cerium oxalate. It is indicated for use in arteriosclerosis and similar conditions — *Pharm Zentralh*, 76 (1935), 554 (E V S)

Pharyngil (Sachsischen Serum Works A G, Dresden) contains neo pyocyanase 15%, water free glycerin 80% and different anesthetics 5% and is used for the quick removal of irritations and inflammations of the throat and the upper air passages by spraying — *Pharm Monatsh*, 16 (1935), 122 (H M B)

Phosoforme Drops (Drouet et Plet, Paris) contain *o* phosphoric acid and 30% ethyl ester of phosphoric acid. An ethoxy determination shows that the ester consists of 19.34% monoethyl derivative and 11.82% of the diethyl derivative — *Pharm Monatshefte*, 16 (1935), 138 (H M B)

Physormon-Schnupf Powder (Chem fabrik Promonta G m b H, Hamburg) is a powder containing in 1 Gm 100 Voegtlin units of posterior pituitary substance for the rapid use in diabetes insipidus — *Pharm Monatsh*, 16 (1935), 122 (H M B)

Pigofusin (Pharm Industrie Gesellschaft, Offenbach) is an isotonic sterile convenient liquid for infusions and injections and has a salt content similar to that of sea water — *Pharm Monatshefte*, 16 (1935), 122 (H M B)

Polymalan (Dr Sidler and Co G m b H, Freiburg) is an alcoholic ether boroglycerin salicylic acid ester solution with compound tincture of capsicum and balsam peru used for rheumatism and gout. For internal use it is sold as capsules — *Pharm Monatshefte*, 16 (1935), 122 (H M B)

Prophylactic Kit A venereal prophylactic kit designed by the Danish Apothecaries Society is described. Three grams of *Sol Argenti Nitralis prophylact* and a 10 Gm tube of *Unguentum Calomelanos prophylacticum* are provided together with means of application — *ANON Arch Pharm og Chem*, 42 (1935), 451 (C S L)

Proveinase Midy (Midy Works Vienna) is a tonic for the venous walls, and is used in the form of tablets in phlebitis, oedemas hemorrhoids, circulatory disturbances. For acute cases doses of 3-6 tablets are given daily, for chronic cases 2-4 tablets daily — *Pharm Monatshefte*, 16 (1935), 123 (H M B)

Prusenilla Powder (Hoffman and Kohler Altona) to combat *pruritus senilis* and dysidrose consists of salicylic terpene esters finely divided into an antiseptic powdered substance — *Pharm Monatshefte*, 16 (1935), 123 (H M B)

Pudan Head and Foot Powder (Scott & Bowne G m b H Kosmetische Abteilung, Frankfurt a M) is a specially prepared spongy talc, the small particles of which are coated with a skin related fat which is easily reabsorbed from the skin. The powder also contains salicylic acid — *Pharm Zentralh*, 76 (1935), 461 (E V S)

Puerperalfieber-serum (Concentrated Streptococcus Serum) (Behringwerke "I G Farbenindustrie, Aktiengesellschaft Leverkusen) in ampuls of 25 cc, is administered intramuscularly in 50 cc doses for severe cases of puerperal sepsis — *Apoth Ztg*, 50 (1935), 365 (H M B)

Purosan (Purosan Nahrungsmittel G m b H Leipzig C 1) is a dried beer yeast for the prevention and treatment of diseases. It is rich in vitamin D due to intensive ultraviolet irradiations. The preparation is taken internally for skin diseases, diabetes scrofula tuberculosis, anemia, rickets and chronic women's diseases and externally where fluorine is in use — *Pharm Zentralh*, 76 (1935), 461 (E V S)

Pyrestasin (Synochem Präparate Gesell, b H Berlin) is an analgesic in rheumatism and neuralgias and consists of a combination of molecular quantities of ethyl ester of aminobenzoic acid and dimethylaminophenyldimethylpyrazolon (about 2.3) — *Pharm Monatshefte*, 16 (1935), 123 (H M B)

Racefo Powder (Dr Nussbaum and Co Chem Fabrik, Würzburg) for asthmatic conditions consists of 0.05 Gm the ophyllinethylene diamine 0.05 Gm caffeine 0.0025 Gm agaricinic acid, 0.015 Gm synthetic racemic ephedrine 0.01 Gm extract belladonna and 0.01 Gm dimethylamidopyrazolon in each — *Pharm Monatsh*, 16 (1935), 123 (H M B)

Reinecke's Blood Regenerator (Fabrik für pharm Spezialitäten Homöopathie und Biochemie G A Reinecke Hannover) is a concentrated extract from the freshly collected leaves

and fruits of the mistletoe *Viscum album* L. manufactured by a special process to protect the natural constituents. It is indicated for use in cases of high blood pressure, vein calcification, aging, headache, vertigo and vasomotor disturbances of the climacteric—*Pharm Zentralh*, 76 (1935), 461 (E V S)

Roba Salts (Walter Bühner & Co, Bremen 1), contains sodium bicarbonate, magnesium carbonate, calcium phosphate, sodium sulphate, calamus rhizome powdered absinthium and powdered anise. It is used for nervous gastric irritations—*Pharm Zentralh*, 76 (1935), 354 (E V S)

Rugosan Concentrate (Labor pharm diätet Präparate G Breitwieser, Krefeld) an expectorant for bronchitis, is a percolate of castanea, drosera and thyme, saponin (0.5%) and potassium iodide (3%)—*Pharm Zentralh*, 76 (1935), 431 (E V S)

Rugosan Concentrate with Codeine (Labor pharm diätet Präparate G Breitwieser, Krefeld) is a percolate of castanea, drosera and thyme with 0.5% of codeine and ephedrine and 20% of bitter almond water added. It is indicated for coughs, and bronchial and pulmonary asthmas—*Pharm Zentralh*, 76 (1935), 431 (E V S)

Salzschlurfer Pills (Dr W Dernbach, Apotheker, Bad Salzschlirf), a constipation and blood purifying remedy, contain extract of aloe, extract of cascara and *Ipomoea turpethum*—*Pharm Zentralh*, 76 (1935), 354 (E V S)

Sanosin Tablets (Chem Fabrik Perdyamin G m b H, Berlin 027) contain quinine hydrochloride, caffeine, phenacetin and dimethylaminophenazone. It is used for grippe, arthritis, angina and dysmenorrhea pains—*Pharm Zentralh*, 76 (1935), 354 (E V S)

Sanotrapp Herb Extract (Dr Schmidtsche Apotheke, Inhaber Otto Trapp, Tübingen), a blood purifying and an arteriosclerotic preventive, is a percolate of sarsaparilla, tormentilla, angelica, millefolium, gentian, absinthium, crataegus and viscum—*Pharm Zentralh*, 76 (1935), 431 (E V S)

Sapo Liquidis Noury (Noury, Ltd, Deventer) is a liquid soap which is clear at ordinary temperature, foams well and does not irritate the skin. It is used among other things, as a shampoo—*Pharm Weekblad*, 72 (1935), 1045 (E H W)

Scottin (Scott & Bowne G m b H, Pharm Fabrik, Frankfurt a M) is a natural standardized vitamin preparation manufactured from halibut liver oil. Scottin is marketed in pills containing in each 4250 vitamin A units and 250 vitamin D units, and in liquid form containing in each drop 1160 vitamin A units and 70 vitamin D units. They are used for conditions lacking these vitamins such as rickets, osteomalacia, distorted growth of the teeth, and to raise the vitamin A and D content during the lactation period of the mother—*Pharm Zentralh*, 76 (1935), 555 (E V S)

Sediletten Wafers (Cormedia, Chem-pharm Präparate, Mainz) contain in each wafer 0.03 Gm of phenylallylmalonylurea, 0.35 Gm of potassium sodium bromate, 0.05 Gm of quinine hydrochloride, 0.03 Gm of pyrazolone, and a homeopathic dose of phosphorus. It is used as a sedative—*Pharm Zentralh*, 76 (1935), 461 (E V S)

Sedonan (H R Napp, London) consists of 5% solution of phenyldimethylpyrazolon in anhydrous glycerin and is used to reduce pain and diminish inflammation in acute otitis media, otalgia and other inflammatory conditions of the ear—*Drug and Cosmetic Ind*, 37 (1935), 127 (H M B)

Sédospasmol (Fabrik pharm Präparate Karl Engelhard, Frankfurt a M), an antispasmodic remedy is marketed in cachets and tablets. The cachet contains eumydrinephedrine, phenylethylbarbituric acid, 0.5 Gm of a bromide, and an easily absorbable calcium salt. They are of use in gall stone colic, bladder spasms, bronchial asthma and dysmenorrhea. In the tablets, the quantities of the spasmolytic and sedative active ingredients are increased—*Pharm Zentralh*, 76 (1935), 431 (E V S)

Sédotyol (Laboratories Debat) is a soothing and antipruritic ointment containing Scuroform 3.75 Gm, benzoic acid 1.25 Gm, Subcutine 1 Gm, zinc oxide 14 Gm, titanium oxide 6 Gm, sodium borate 0.1 Gm, extract of hamamelis 1 Gm. Lanovaseline enough to make 100 Gm—*Bull Ch Synd Pharm Seine* (June 1935), through *J pharm Belg*, 17 (1935), 672 (S W G)

Steegeal Preparations (A L Steege, Leipzig) designated as A, H, M, T (drink cure) are chiefly 10-30% solutions of potash with small additions of liquid petrolatum, volatile oil, camphor

or plant extract Steegonal-Bath is a 30% potash solution with about 1% soap—C A ROJAEN and W BRAUNE *Apoth Ztg*, 50 (1935), 815-816 (H M B)

Stomachysatum (Johannes Burger, Ysatsfabrik, G m b H, Wernigerode) consists of the extracts of *Artemisia absinthium*, *Achillea millefolium*, *Gnaphalium arenarium*, *Rheum palmatum*, using the fresh green plants, and is used for dyspepsias, stomach catarrh, disturbed appetites and irregular stools—*Pharm Monatshefte*, 16 (1935), 123 (H M B)

Sulfigen (Anhaltisches Serum Institut G m b H, Berlin Dessau) is a protected colloidal sulphur preparation containing about 0.13% of sulphur and 0.57% of sulphur dioxide. The antiparasitic containing action justifies its use for scabies, ulcer cruris, eczema psoriasis and fistulas—*Pharm Zentralh*, 76 (1935), 461 (E V S)

Tablets 111 (Kloster Laboratories Maulbronn) for hyperacidity, heart burn, gastric disturbances, etc., contain extract of condurango bismuth subnitrate, milk sugar, sodium bicarbonate, heavy magnesium and oil of peppermint—*Pharm Monatsh*, 16 (1935), 123 (H M B)

Täsch-Nasol catarrhal preparation (Chem pharm Fabrik E Täschner, Potsdam) contains benzyl and menthyl esters dicalcium citrate, and potassium oxyquinoline sulphate in a viscous solution. Täsch-Nasol catarrhal salve is similar to the above except that boric acid in glycerin is substituted for the dicalcium citrate. It is marketed in tubes containing a nasal nozzle—*Pharm Zentralh*, 76 (1935), 432 (E V S)

Thyranon pro injectione (Organon Ltd, Oss) is a thyroid preparation for subcutaneous and intramuscular injection. Each ampul contains 0.2 mg of combined organic iron and corresponds to 1 tablet of thyranon (100 mg thyroid powder)—*Pharm Weekblad*, 72 (1935), 1043 (E H W)

Tonicum Noury (Nourypharma Ltd, Deventer). Each 100 cc contains 20 Gm liquid extract of kola, 10 Gm glycerin, 1 Gm tincture of nuxvomica, 0.1 Gm sodium methylarsenate, 0.2 Gm sacch manganosus and 3.7 Gm sodium biphosphate. Dose: 1 teaspoonful three times a day—*Pharm Weekblad*, 72 (1935), 1044 (E H W)

Tonicum Waldheim (A Waldheim, Vienna) consists of sodium glycerophosphate, sodium methylarsinate, manganese chloride and strychnine nitrate—*Pharm Post*, 68 (1935), 387 (H M B)

Tordiol (Siemens, reiniger Verfa Berlin) a roentgen contrast agent, is a 20% colloidal thorium dioxide preparation—*Pharm Monatsh*, 16 (1935), 123 (H M B)

Tusседat (Sagitta Werk G m b H, München) is a drop preparation containing *Castanea vesca* drosera, primula, thyme, benzoic acid, some bromide salts and ephedrine (0.35%). A stronger preparation is also available in which the ephedrine is replaced by ethylmorphine (0.8%). It is indicated in pertussis and all coughing conditions of the respiratory tract—*Pharm Zentralh*, 76 (1935), 555 (E V S)

Trilysin (Promonta G m b H, Hamburg) is a hair water consisting chiefly of an alcoholic solution of cholesterol to which chloroform or carbon tetrachloride has been added in addition to some plant tinctures—*Pharm Monatshefte*, 16 (1935), 139 (H M B)

Uranyl Salve (Dr H Truttwein, Dresden) is a radioactive iodine uranium salve with 10% iodine and uranium. As bases petrolatum and lard are used—*Pharm Monatshefte*, 17 (1935), 139 (H M B)

Valvonol (Anhaltischen Serum Institutes Dessau) is a disinfecting agent consisting of chlororesol, chlorphenol, chlorxylenol and chlorthymol dissolved in a neutral soapy alcoholic and mild base. It is an unusually strong bactericide, non poisonous, non irritating and does not attack materials—*Pharm Monatsh*, 16 (1935), 139 (H M B)

Vinococete (Chem Werk Dr Klopfer Dresden A 20) preparations are prepared from alcoholic complex colloidal plant extracts concentrated to contain sufficient dosages of the drugs employed. *Vinococet Anticystiticum*, a remedy for catarrhal pains of the urinary organs, especially the bladder, contains *Sorbus aucuparia*, *Hernaria glabra*, *Verbena officinalis*, *Fragaria vesca*, *Cochlearia officinalis*, *Betula verrucosa*, *Arctostaphylos uva ursi*, *Carex* and *Lamium album*. *Vinococet Antidiabeticum*, a diabetic remedy in all forms and stages, is prepared from *Vaccinium myrtillus*, *Potentilla tormentosa*, *Juniperus communis*, *Taraxacum officinale* and *Rubus fruticosus*. *Vinococet Antiscleroticum*, an arteriosclerotic, gout and rheumatic remedy, contains *Drosera rotundifolia* and *Rosa canina*. *Vinococet Cardiacum*, a heart tonic to increase the power of the heart beat, is prepared from *Crataegus oxyacantha*, *Menyanthes trifolium*, *Nasturtium humulus*, *Allium ursinae*,

Marrubium album and *Leonurus cardiaca* *Vinococ Cholericum* is prepared from *Capsella bursapastoris*, *Orthosiphon stamineus*, *Cimicis benedictus*, *Alpinia officinarum* and *Gentiana lutea*. It is used against all sicknesses of the gall bladder, the gall duct and the liver. *Vinococ Diureticum*, a dropsy remedy in all forms, stages and appearances, is prepared from *Ononis spinosa*, *Petroselinum sativum*, *Levisticum officinale*, *Bryonia alba*, *rosmarinus* and *Phaseolus vulgaris*. *Vinococ Lactagogum* is prepared from *Anethum graveolens*, *Galega officinalis*, *Polygala amara* and *Carex arenaria*. It is indicated for deficient milk excretion in the nursing mother. *Vinococ Nephriticum* is prepared from *Lamium album*, *Polygon avicul*, *Acorus calamus*, *Solidago virgaurea*, *Geranium Robert*, *uva ursi* and *Borago off*. It is used for nephritis, renal contractions and bleeding. *Vinococ Pectorans*, a remedy for pains of the lungs, for bronchitis, pertussis, grippe, etc., is prepared from *Levisticum officinale*, *Tussilago farfara*, *Inula helenium*, *Thymus vulgaris*, *Plantago lanceolata* and *verbascum*. *Vinococ Phthisicum*, a remedy for all stages and forms of tuberculosis is prepared from *Achillea millefolium*, *Pulmonaria officinalis*, *Galopsis ochroleuca* and *inula*. *Vinococ Spasmolyticum* is prepared from *Matricaria chamomilla*, *Achillea millefolium*, *Mentha piperita* and *Gentiana lutea*. It is used for cramps of various origins, especially the gastric and digestive organs. *Vinococ Uterinum* is prepared from *Polygonum hydropiper*, *Cratogeomys oxycantha*, *Alchemilla vulgaris*, *Rhamnus frangula*, *Achillea millefolium* and *Matricaria chamomilla*. It is indicated for acute and chronic types of dysmenorrhea, climacteric maladies, etc.—*Pharm Zentralh*, 76 (1935), 380 (E V S)

Vistonic Syrup (Laboratory Farmacol Reggiano, Corregio, Italy) is a combination of copper-chlorophyll, iron and manganese glycerophosphate, quinine, caffeine and extract of *nuxvomica* marketed in packages containing 115 Gm and in packages of 20 tablets (each tablet = 0.0025 Gm of the extract)—*Pharm Post*, 68 (1935), 327 (H M B)

PHARMACEUTICAL ABSTRACTS

Published by the

American Pharmaceutical Association

VOLUME I

MARCH TO DECEMBER

1935

Editor A G DuMez



School of Pharmacy University of Maryland
Baltimore Maryland

INDEX OF AUTHORS

A

- Abdukkadir Lufti toxicity of castor beans 191
 Abelin I, assay of various preparations of thyroid 189
 Abildgaard J reactions of solutions of novocaine on sterilization and storage 48
 Abramowitz T W reactions caused by phenol phthalein 251
 Abt A F use of cevamic acid (ascorbic acid) in the treatment of infantile scurvy 34
 Acevedo B S pregnancy diagnosis 104
 Adams R introduction of isobutyl groups into phenols cresols and homologous compounds 7
 Addinall C R sex hormones II estrus producing hormones 202
 contributions of medicinal chemistry 205
 sex hormones I hormones of the anterior hypophysis 116
 Adnot Mme distillation of aromatic waters for determination of volatile constituent 9
 Aeschlimann J A synthesis of new medicinal alkaloids 157
 Ahlm T rhizome and extract of male fern 188
 Alber H K improvements in microchemical laboratory technique 307
 Albers C C value of botany course as a foundation for the pharmacognosy of stem and bark drugs 135
 Alexander G H sedatives types uses and dangers 87
 Allard J study of citronellol rhodinol isomerism by means of raman spectrography 208
 Allen, W M inhibition of uterine motility with crystal line progesterin *in vivo* 339
 Allport N L deterioration of atropine eye ointments on storage 310
 Alpers H morphine habituation withdrawal cure with quinine 350
 Amador R S ratio between effective and lethal doses of bulboecapnine in the cat 242
 Ambroz W F pharmacist and the podiatrist 335
 Ammerman M studies of crystalline vitamin B IV injection method of assay 248
 Amy L new apparatus for measuring ultraviolet absorption 316
 Anderson A C differentiation of vitamin A from carotene by means of antimony trichloride 130
 Anderson E M studies on the thyrotropic hormone of anterior pituitary 112
 Anderson H P some organic mercurials 154
 Andrews J action of morphine as a metabolic stimulant 244
 Andrews M J determination of reasonable or permissible margin of error in dispensing II ointments 79
 margin of error in dispensing Determination of the reasonable or permissible margin of error V liquids 236
 Andrieu G skin reaction of diphtheria toxin 270
 Anger I F V application of spot reactions to detection of organic compounds 127
 Angla B characteristics of 1934 Algerian geranium oil 104
 Anselm E use of prontosil in puerperal fever 195
 Anselme C acid indices of official oils and waxes lime liniment of the Belgian Pharmacopoeia IV 214
 Ansingh E Q behavior of various acids toward quinine tannate 102
 Antoine G determination of colloidal silver in organic medicinals application to ointments 160
 Appel H improved method for the synthesis of coumarins by v. Peckmann's method 286
 Arend A G Nail polishes and enamels 133
 grease paints 234
 lip stick 78
 manufacture of hair dyes 234
 Arnal Y sensitive reagent for aluminum separation of aluminum and beryllium 216
 Arnold F W Jr use of *n* propylarsonic acid as a reagent for the determination of zirconium 16
 Arnolt R I alkaloids of *Cereus coryne* 157
 Arquet M solubility of phenylethylbarbituric acid in ether 311
 Ashb W F blood sugar changes after 1-2-4 di-nitrophenol 138
 Ashimoto A on the constituents of *Hydrangea paniculata* and on *hydrangin* 284
 Atkins F classification of commercial ylang oils 274
 Aub J C biochemical behavior of lead in body 31

- Audidier H volumetric determination of arsenates 218
 Augusti S β aminophenol hydrochloride as a reagent for cupric and ferric ions 120
 microchemical of iodide ion 124
 micro reaction of chromium pigment 119
 systematic method for the identification of mineral pigments II, blue and green pigments 308
 systematic method for microchemical identification of mineral pigments 125
 Augustin J soaps and soap substitutes in tooth preparations 179
 brushless shaving creams 326
 lanolin and its uses 235

B

- Bachrach R L synthesis of perfumes preparation of methylene ester of pyrocatechol 112
 Badzyny St adsorption charcoal prepared from crude cellulose 110
 Baert C G anesthetics with special reference to cocaine and novocaine in illegal trade 295
 special detection of cocaine and novocaine anesthetics with reference to smuggled goods 8
 Bagchi K N method for the colorimetric determination of small quantities of iodide in the presence of other halides 13
 Baggesgaard Rasmussen H solubility of morphine in different solvents 102
 Bailey K C decomposition of hydrogen peroxide in presence of glass wool and copper sulphate 274
 Bailey O orthophosphoric acid migration phenomena in the course of hydrolysis of the three mixed diesters 275
 Bailey R H control of whooping cough with serum and vaccine 273
 Bain J surgical dressings criticism of some of the codex standards 224
 criticisms of some codex standards for surgical dressings 325
 Bajewski-Sowet use of gonococcus vaccine in acute gonorrhea 348
 Baker A B latent tuberculosis antibodies 98
 Baker G L solubility of some strychnine benzoates 159
 Balasand J constituents of the rhizome of *Cimicifuga racemosa* 162
 Baldinger L H continuous reading titration apparatus 19
 suggested formula for white liniment 78
 Baldini C cosmetic pomade 233
 Balzarelli F cosmetic pomade 233
 Bambach K stability of diethane solution II 120
 volumetric determinations of halides use of di-chlorofluorescein as an adsorption indicator 220
 Bandon A J garlic and its preparations 91
 Banks A composition of commercial palm oils IV progressive hydrogenation as an aid in the study of glyceride structure 106
 Banks N S Ferry's meningococcus antitoxin 97
 Barbour F A respiratory effects of morphine codeine and related substances III effect of morphine dihydromorphine dihydromorphinone (dilaudid) and dihydricodeinone (dicodid) on respiratory activity of rabbit 30
 Barbour H G action of morphine as a metabolic stimulant 244
 effects of phenacetin and aspirin respectively upon action of phenobarbital 245
 Barger G alkaloids of senecio 208
 Barz Z influence of method of preparation of nitroglycerin tablets on nitroglycerin content 73
 evaluation of tinctures made according to six different procedures 73
 Barkenbus C oil of rose mallow seed 107
 Barlow O W relative efficacy of a series of analgesics as antidotes to sublethal and lethal doses of pentobarbital chloral hydrate and avertin 338
 Barowsky H investigation of the new biologic test for hormones in pregnancy urine 290
 Barsch H separatory funnel 314
 Bartholomew R A advantages of paraldehyde as basic anesthetic agent in obstetrics 36
 Bartz Q R introduction of isobutyl groups into phenols cresols and homologous compounds 7
 Bassett H solubility and determination of calcium hydroxide, 218
 Bateman F C L alcohol content and specific gravities of tinctures of B P C 1934 324

- Batterman R C reaction at site of injection of mercurial diuretics as influenced by theophylline 250
- Bauer K H evaluation of drug plants in 1934 205
- Bauer O vitamin synthesis 104
- Bauke L E clinical studies with intestinal and parenteral administration of diglucan 193
- Baumgarten G determination of oil of peppermint 310
- Baxter G P fifth report of committee on atomic weights of the International Union of Chemistry 156
- Bazille M S importance of fluorinated methemoglobin in the determination of fluorine in industrial hygiene 224
- Beal G D activated charcoal 299
- Beal J H Pharmacopoeia of the U S and the Federal Food and Drugs Act 374
- Beaune A biological estimation of male hormone upon the hardhead 244
- Becker S Yugoslavian opium 226
- Beerman H *et al.* dioxanthrol 18 a substitute for chrysarobin 35
- Begg N D value of insulin in toxic diphtheria 91
- Beguin C investigation of some species of honey suckle 283
- hygroscopicity of dried extracts of the new Swiss Pharmacopoeia 320
- Behr G dentifrices 233
- Belknap E L control of lead poisoning in workers 32
- Bell M L absorption of carotene and vitamin A 239
- Benda L therapeutic dye solutions 193
- Bender L E treatment of chorea with nyranol 36
- Bennett C T melting point of chloral formamide 300
- alcohol content and specific gravities of tinctures of B P C 1934 324
- Benoit G chemical and physiological study of amines and diamines with ethylene grouping 54
- Berg B N blood sugar curves in normal and diabetic dogs after intravenous injections of insulin 139
- Bergstrom F W metabolic activity of compounds related to dimorphonol 28
- Berry H preparation of digitalis tincture relative merits of maceration and percolation 320
- hydrogen ion concentration of injections 124
- pharmaceutical aspects of British Pharmaceutical Codex 1934 73
- Berry P A revision notes on British Pharmacopoeia 133
- Bertonasco E proportion of digitoxin in digitalis 274
- digitoxin content of digitalis purpurea 283
- Beutler R determination of cane sugar content of small volumes of solutions from specific gravity and specific rotation 10
- Bhattacharya R constitution of lac 112
- Bidwell E H effect of nembutal upon serum cholesterol of dogs 188
- Bien G E differential reactions between carotene and oils rich in vitamin A 130
- Bieter R N spinal anesthesia in the rabbit therapeutic coefficients 247
- Bijslaa U G report of the investigation of East Indian digitalis leaf 70
- Bing F C method for the estimation of serum iron 116
- Binger M W diuretic action of potassium salts 246
- Binet L food value and anti anemic power of oysters 139
- Binkert A β - iodohydroxy naphthalenedisulphonic acids 56
- Birch C A methyl chloride poisoning 89
- Birza J W examination of copaiba balsam 64
- Biscaro G Italian and Hungarian matricaria 205
- Blakeslee A F fertilization of *Datura stramonium* and *D metel* in the incompatible cross 204
- Bland J O W growth and development of psittacosis virus in tissue cultures 155
- Blazek Z scheme for microscopic examination of drugs 70
- derivatives of *n* phenyl piperazine 286
- Blench R O suggested test for distinguishing between meat extract and yeast extract 14
- Bhss A R Jr children's tooth pastes 77
- comparative study of the absorbability of calcium compounds 137
- opium comparison of proposed methods 222
- tannic and picric acid in burns 352
- trichophytosis 353
- Block E compositions for use as vehicles for other substances 237
- Block J compositions for use as vehicles for other substances 237
- Block C J native poisonings in the Dutch Indies 89
- Mount B K veratrine alkaloids, parts I and II, 169
- Blumendal H B cerimetric titration of small amounts of iron by means of α α dipyridyl as indicator 305
- Bor P note on mercury pill B P 1972 237
- Boam J J determination of rotenone in derris root and resin 68
- constituents of derris resin 55
- Böhm R, action of substances isolated from croton oil 184
- Bogen F studies of correlated human and bovine brucellasis 153
- Boltanski I Iugol's solution 175
- Bolz N O regeneration of glycerol in production of glycerophosphates 56
- Bonsdorff B toxic reactions of amulopyrine 249
- Bose A C method for the determination of small quantities of iodide in the presence of other halides 13
- Bose M K estimation of zinc in the presence of iron aluminum uranium beryllium and titanium 316
- quinaldine acid as a micro reagent I estimation of zinc and its separation from manganese 127
- Boseki K K glycyrrhizin 161
- Bougault J reaction for the identification and determination of citral 169
- silver mercury complex 275
- Bowen J I storage of drugs new problems in drugs 228
- Bowers H R analysis of magnesium carbonate 66
- Bracaloni I new method for the quantitative determination of quinine iodobismuthate 312
- Braccio L I ultrafiltration and its application to the extraction of the active principles of plants, 230
- Braceland F G use of hematoporphyrine as a therapeutic agent in psychosis 118
- Brahm C separation of hormones and lipoids 114
- Braker W phenyl procaine local anesthetics 19
- sulphide analogues of azo dyes having bactericidal properties 345
- Bramwell B R gastric secretions 111
- Brandrup W fluidextract of thyme and its preparations 174
- preparation of dry extract of belladonna 322
- Branhiam S L protection of mice against meningococcus infection by polyvalent meningococci serum 268
- Brard D toxicological study of some chromium compounds 31
- Braun L anatomical investigation of the leaves of *Polypodiaceae* of pharmaceutical interest 156
- Bravo I some effects of alpha-dimorphonol on pregnancy in white rat 83
- Brew M value of tolu coating U S P X and N F V 133
- Brewer R K body temperature changes produced by sodium salts of some aromatic acids 84
- Briggs D R physicochemical studies on acacia solutions III osmotic pressures of solutions of arabic acid and sodium arabate 156
- Briggs W P theory of pharmacy and academic standards 81
- Brintzinger H cellophane and Luprophane as dialysis membranes 218
- Brocal M M chemical study of Sierra Nevada digitalis 21
- Brodie M active immunization against poliomyelitis 46
- active immunization against poliomyelitis with germicidally inactive virus 46
- convalescent serum in poliomyelitis 154
- Brown A poisoning of children by strychnine 90
- Brown C L M note on isopropyl nitrite 286
- some properties of glycols with special reference to the use of propylene glycol as a solvent in pharmaceutical preparations 323
- Brown F contribution to pharmacology of nicotine 245
- Brown H W anthelmintic studies on alkylhydroxy benzenes III 6 *n* alkyl meta cresols 27
- anthelmintic studies on alkylhydroxybenzenes I alkylpolyhydroxybenzenes 27
- oral toxicity of 6 alkyl meta cresols 83
- Bruce W F growth of bacteria in organic acid media 2
- Brugsch T cinchophen (atophan) therapy and the liver 346
- Brundage J T comparative study of actions of morphine and dihydromorphine (dihydromorphine hydrochloride) on intact small intestine of dog 30
- action of apomorphine upon small intestine in non anesthetized dogs 84

- Bruno F Cymbopogon flexuosus Stapf and Cymbopogon martinii Stapf var Motia oils 102
- Brus G study of citronellol rhodinol isomerism by means of raman spectrography 208
- Bruse W I preheater for the microanalytic determination of carbon and hydrogen 209
- Bryan H F action of mercurial antiseptics on muscle oxydase 188
- Bryant W M D aldehydes and ketones improved hydroxylamine method for determination of displacement of oxime equilibria by means of pyridine 8
- Bryce D A medicinal dyes 110
- Buechi bakelite containers 235
- Buechi apparatus for the preparation of sterile distilled water 320
- Buechi J stability of spiritus sinapis Swiss Phar V 176
- Buchman I R studies of crystalline vitamin B₁ VIII sulphite cleavage II chemistry of the acidic product 164
- studies of crystalline vitamin B₁ cleavage of vitamin with sulphite 61
- Buchner A pharmaceutical emulsions 321
- Buck J S relative anesthetic effects of various ureas 248
- Büchi bakelite ointment jars 180
- Buell M F seed and seedling of Acorus calamus 204
- Bukey I S value of tolu coating U S P N and N F V 133
- comparative study of enteric coatings 347
- Bull A W percolation of cinchona and belladonna rate of alkaloidal extraction and effect of degree of comminution 319
- Bullock B volumetric microdeterminations of chloride and potassium ions 218
- Bullock K assay processes and stability of commercial pepsin 170
- Bunney W F use of wax paraffin ampuls for silver nitrate used in prevention of ophthalmia neonatorum 324
- use of intradermal injections of toxin toxoid mixtures 153
- Burckhardt E stable solutions of calcium gluconate 55
- ergobasine new water soluble alkaloid of ergot 206
- Burger A M sage oil in perfumery and cosmetics 179
- Burhans R A experience with gonococcus filtrate in treatment of gonorrhea 2
- Burker L S new spot reaction for cesium 209
- Burlingame H M theory of pharmacy and academic standards 81
- comparison of four year curricula in pharmacy 80
- Burn J H isolation of ergometrine 206
- Buskirk H H Acrobacter anergenes as cause of rotiness in maple syrup 52
- Butler C L value of cinchona alkaloids in pneumonia miscellaneous alkaloids and some hydrocarbons ethers 85
- pneumococcal value of cinchona alkaloids 111
- apocuprenes (apocupine) 153
- Butler M R some properties of polysaccharide complex from Chondrus crispus 3
- C
- Cahn R S constituents of derris resin 55
- determination of rotenone in derris root and resin 68
- peritoxin part I 287
- Calderone F A studies on dosage of pre anesthetic medication with narcotics (barbiturates magnesium sulphate and morphine) 337
- Caldwell J R iodometric determination of copper 11
- modified Volhard method for determination of chloride 10
- Callahan E T bacteriostatic action of skatole on Gram negative enteric bacilli 272
- Callister C P preparation of liver extract 115
- Campbell D treatment of parathyroid tetany 92
- Campbell N R melting point of chloral formamide 300
- Canti R G growth and development of psittacosis virus in tissue cultures 155
- Carelli A value of sodium silicilate in the treatment of some diseases caused by a filtrable virus 351
- Carlson H E effect of morphine on human ureter 188
- Carr C J fate of mannide and isomannide in the animal body 244
- contribution to the pharmacology of trichlorethylene 248
- study of the anesthetic properties of trichlorethylene 340
- Carrel A thyroid glands 340
- Carter J B use of strychnine and quinidine in treatment of premature contractions 196
- Casimada R S M Tollen's reaction in analysis of medicinal products 66
- use of Tollen's reaction in the analysis of medicinal products 316
- Casper W Naftalan 42
- Castiglioni A reaction for peroxide in ether 122
- Castle W B effect of autolysis on potency of liver in treatment of pernicious anemia 115
- Cattelain E reaction for the identification and determination of citral 166
- silver mercury complex 275
- Cavalie triple poisoning by arsenic 172
- Cawston F G consideration of the antimony content in drugs used for the destruction of schistosomes 344
- Chabre P determination of vitamin A in oils by the spectrophotometric method 129
- Chalmers A chaulmoogra oils in pharmacopoeias and in commerce 50
- chaulmoogra oil in the pharmacopoeias and in commerce 300
- Chalmers C chaulmoogra oils in pharmacopoeias and in commerce 50
- chaulmoogra oil in the pharmacopoeias and in commerce 300
- Chamberlain J S synthesis of 5,5-alkylphenylbarbituric acids 6
- Chandler G C use of n-propylarsonic acid as a reagent for the determination of zirconium 16
- Chap J I synthesis of 5,5-alkylphenylbarbituric acids 6
- Chapman C W influence of vitamin C on development of skin sensitivity to neosphenamine in guinea pig 88
- Charauz C sophoricoside new heteroside from fruits of Sophora japonica 283
- study of Persica vulgaris (peach tree) and persicoside 283
- Charlton D B some observations on the germicidal efficiency of chloramine T and calcium hypochlorite 289
- Charlton H L depilatory developments 328
- Charters D L ophthalmic therapeutics 91
- Chelle toxicologic study of potassium ferrocyanide as a clarifier for white wines 171
- Chelokhanova V value of sodium nitrate as antidote to hydrogen sulphide 89
- Chen A L action and toxicity of retrorsine 246
- Chen J S determination of total lipid in plant and animal tissues 14
- Chen K K action and toxicity of retrorsine 246
- cyanide poisoning and its treatment 341
- Cheney R H effect of caffeine per se and caffeine beverage on reaction time in young adults 84
- Chevallier A determination of vitamin A in oils by the spectrophotometric method 129
- Chu Youh Gong constituents of roots of cha hu (Bupleurum falcatum L.) 284
- Chuerici E preparation of some sterile solutions 231
- trends in face powders 234
- Chilson F new drug extraction processes 23
- Chi Wo Hsu composition of purple flowered: mao tsao 102
- Cholak J quantitative spectrographic determination of lead in urine 14
- Chomenko A maximum yield of camphor obtained from Laurus camphora 165
- Chopra G S administration of opium to infants in India 350
- Chopra R N toxic effects of emetine 31
- administration of opium to infants in India 350
- Chou T Q constituents of European Datuna stramonium cultivated in China 210
- Chowdhury J C a new alkaloid from the bark of Holarrhena antidysenterica 207
- Christen R use of silver salts in pyelonephritis 351
- Christensen E V preparation of dihydroxypropyl esters of fatty acids and use in emulsions and ointments containing water 106
- Christensen L M analysis of acetone n-butanol and ethanol in aqueous solution 214
- Christiansen J tests for disinfectants 29
- Christiansen W G attempt to ketonize ergosterol 58
- analogues of sulphide dyes having bactericidal properties 345
- chlorinated and brominated hydroxybiphenyls 55
- phenyl procaine local anesthetics 169

- preservation of halibut liver oil with hydroquinone 209
 shark liver oil 107
 study of germicidal and antiseptic activity of some mercury compounds 103
 study of a new series of urethanes 7
 therapeutic substances derived from unsymmetrical diphenyl compounds 111 some aryl esters of the hydroxy diphenyls 337
 Christie A effect of intravenous injections of acacia on physico-chemical properties of blood 82
 Church C F vestibular function test for vitamin E deficiency in the rat 139
 Cienciarelo concentration of scarlet fever antitoxin 46
 Cimerman C microdetermination of zinc by means of anthranilic acid 317
 Cionga E presence of α pyrrol methyl ketone in stabilized valerian 211
 valerian alkaloids presence of α pyrrol methyl ketone in stabilized official valerian 159
 Claiborn L N anti anemia potency of liver after gastrectomy in swine 80
 Clark A H potassium guaiacol sulphinate 287
 Clark E P preparation of picrotoxin 162
 Clark R W national food and drug legislation 238
 Clemo G R properties of β sentonin 288
 Cimenko D R inhibition of leucogenic activity of amidopyrine in rabbit by certain cyclic compounds 83
 Clowes G H A cyanide poisoning and its treatment 341
 Clutterbuck P W molecular constitution of Penicillium Charlesii metabolic acids of 56
 Coeh G irreversible fading of phenolphthalein 223
 Cocking T T improved method for estimation of essential oil content of drugs 220
 Coffelt O T preliminary evaluation of a solution of cerous-ceric chromate in the treatment of Vincent's angina and other oral diseases 353
 Cohen R Bioassay of powders of squill 87
 Cohen S M notes on the concentration and purification of antimeingococcus serum 96
 Cohn A E effect of digitalis on pneumonia 193
 Cohn H tannin esters 288
 Coisnard J M constituents of Uvaria catocarpa 285
 Cole H H gonad stimulating product 163
 Cole L treatment of tetanus with avertin anesthesia 344
 Cole W H effects of sodium amytal on erythrocyte count following hemorrhage 87
 Colebrook L antistreptococcal serum 152
 Collard E new falsification of cocaine 11
 Collip J B diabetogenic thyrotropic adrenotropic and parathyrotropic factors of pituitary 116
 interrelationships between urinary pituitary and placental gonadotropic factors 58
 studies on the thyrotropic hormone of anterior pituitary 112
 Colombi C standardization of insulin preparations 29
 Colvin E D advantages of paraldehyde as basic amnesic agent in obstetrics 36
 Conn L W determination of minute quantities of copper in milk 11
 Constantinescu G identification and differentiation of elektargol Lollargol argylol and protargol 121
 Cook E S stability of diothane solution II 120
 Cooper G M application of the Neufeld reaction to the identification of types of pneumococci 97
 Corfield C E British Pharmaceutical Codex 1934 73
 Corran R F determination of mercury content of mercurochrome 306
 effect of hot solvents on ergot note on effect of storage on activity of ergot 322
 Cosentino F N lesions produced by adhesive plas ters and method of determining adhesive power 62
 Coton L a new method of titration of antipneumo coccus serum by the neutralization of the antibodies *in vitro* 203
 application to antistreptococcal serums of a new method of titration by neutralization of the antibodies *in vitro* 288
 Coulthard C E effect of sterilization on calcium chloride solutions 153
 note on the sterilization of injection of bismuth B P 153
 sterilization by dry heat at 150° C with special reference to oils 155
 Cowland A N tannin in maté 52
 Cox A J action of thallium in experimental animals 87
 Cox E G crystalline structure of sugars part I 284
 Craig C F observations on antigens for complement fixation in amebiasis 140
 Craige A H ratio between effective and lethal doses of bulbocapnine in the cat 242
 Cretcher L H cinchona alkaloids ketone formation with sodium amide 99
 pneumococcal value of cinchona alkaloids III, apocuprenes (apoquinine) 153
 value of cinchona alkaloids in pneumonia miscel laneous alkaloids and some hydrocuprene ethers 85
 Crippi G B structure and derivatives of 2 amino benzimidazole 54
 Crocco C Carqueja (Baccharis genistelloides Pers.) contribution to the study of a medicinal plant of widespread use in Argentina 280
 Crossley F S thiobarbiturates 353
 Crossley H determination of small amounts of sulphur in certain organic compounds 68
 Croft C R use of amyl nitrite in cases of contraction ring 252
 Cruckshank J C study of the so called Bacterium Typhi Flavum 269
 Cuculescu I classification of leaves and stems of tea 108
 Cumming R F experience with gonococcus filtrate in treatment of gonorrhoea 2
 Cunningham R W spinal anesthesia in the rabbit therapeutic coefficients 247
 Curtman L J separation and detection of cyanide 64
 Cutting W C action of dinitrophenol on rate of oxidation of ethyl alcohol *in vitro* 242
 effect of alcohol injected intravenously on habitua tion to rate of metabolism 336
 metabolic activity of compounds related to dinitro phenol 28
 Cuyler W K extraction of estrin from female urine after acidification with various acids 163
- D
- Daems W F Dutch pharmacopoeias 325
 Dafert O fluctuation of drug potency during growth 205
 Dahle D determination of fluorine in foods 167
 Dalsgaard A T use of cocoa butter as excipient in pills containing extracts 132
 Dann G E history of the apothecaries of the city of Königsberg the Adler Apothecary 332
 Da Rin C hyperglucemia in diphtheria carbohydrate metabolism and treatment with dextrose insulin 140
 Darmol difficultly soluble preparation of tannin 93
 Dastugue H B Carqueja (Baccharis genistelloides Pers.) contribution to the study of a medicinal plant of widespread use in Argentina 280
 Daubney C G determination of small quantities of chlorine in commercial benzaldehyde 9
 Dautrebande L necessity of controlling pharma ceutical specialties 27
 David K crystalline testicular hormone 292
 David R study of the activity of different cocaine salts 239
 Davis H preparation of sterile solutions 323
 hints and formulae for making tablets on a small scale 324
 notes on new steamer 23
 preparation of digitalis tincture relative merits of maceration and percolation 320
 Davis M E *et al* effect of ergot alkaloids on uterus 85
 Dawson W T toxicity of quinine quinidine hydro quinidine and hydrocinchonidine in guinea pig 87
 Deakers T W colloid mulls and cosmetics 326
 chemistry of lip sticks 76
 Dean H K composition of commercial palm oils IV progressive hydrogenation as an aid in the study of glycide structure 106
 de Beer E J relative anesthetic effects of various ureas 248
 De Clercq A acidity of marshmallow root and pres ence of calcium soluble in acetic acid 108
 De Clercq A determination of proteolytic activity of pepsin 15
 determination of amylolytic activity of pancreatin 15
 De Eds F activity of bone phosphatase in chronic fluorine poisoning 241
 Defandorf J H studies on the bioassay of digitalis II new leg vein and intramuscular guinea pig methods 138

- studies on the bioassay of digitalis III a new diuretic cat method 185
- Defelice L F characteristics and therapeutic use of liver extracts treatment of anemias of bacillary origin 194
- Defrance E solubility of papaverine hydrochloride in presence of certain salts 180
- DeGraff A C reaction at site of injection of mercurial diuretics as influenced by theophylline 250
- DeHoll G cause of bacillary dysentery in infants and children 98
- De Jong J C food poisoning from *Datura stramonium* 250
- Delvaux E analysis of calcium glycerophosphate 62
- Deniges G micro determination of caffeine by colorimetry 105
- microchemical identification of creatine and creatinine 220
- new microchemical reaction of cantharidin 105
- Denison G A cause of bacillary dysentery in infants and children 98
- Denison R hormones endocrinology 111
- De Nito G hypotensive hormone cause of protein shock 194
- De Prado L micromethod of determination of morphine in opium preparations 309
- Derville P carbon tetrachloride experimental investigation on its toxic action by repeated inhalation 137
- Deulofeu V separation of etrones from urine isolation of a folliculin from urine of the horse 114
- Dey B B toddalolactone chemical investigation of *Toddalia aculeata* (Pers.) part 2 109
- Dicke F solution of aluminum acetate G I VI 314
- Didsley C E strong tincture of ginger 232
- Dienes L production of extra bacterial substances in cultures 270
- Dieterle H constituents of *Drosera rotundifolia* 108
- Dietzel R standardization of medicinal agents III particle size and degree of dispersion of important medicinal agents 125
- Dingemans I crystalline testicular hormone 292
- Dingle J virulence tests for typhoid bacilli and antibody relationships in antityphoid sera 152
- Dittmar J H hygroscopicity of sugar and sugar mixtures 53
- Doak G O arsenamides compounds containing the As N linkage 211
- Doisy E A crystalline ovarian follicular hormone 114
- Domagk G bactericidal value of prontosil 154
- Donau J microchemical determination of gold in the presence of palladium and tin 305
- Donovan I K natural violet odor 280
- natural violet odor 161
- Dooley M S body temperature changes produced by sodium salts of some aromatic acids 84
- Dorfel E W vinethin new hypnotic 354
- Dorland W A N recent progress in the treatment of gonorrhea in children 35
- Dott D B examination of three samples of aloin 215
- Doubleday C turtle oil creams 78
- Douglas C M estimation of blood urea 289
- Downing J G new cleansing creams 74
- Doyle J E synthesis of 5,6-alkylphenylbarbituric acids 6
- Draeflin notes on *Syzgium jambolana* 71
- Drake M E some pharmacological and bactericidal properties of umbellulone 104
- Drake N L croton resin III combined acids 4
- Driver J E presence of manganese in commercial lime and bleaching powder 168
- Druce J G F value of magnesium perchlorate (Anhydrous) as drying agent 3
- Drummond J C occurrence of unsaturated hydrocarbon in olive oil 5
- absorption of carotene and vitamin A 239
- Duboué toxicologic study of potassium ferrocyanide as a clarifier for white wines 171
- Dubray R determination of carbon dioxide in confined atmospheres 299
- Dubsky J V microchemical detection of magnesium and aluminum with aluminum and naphthazarin 168
- Dumont P acidity of marshmallow root and presence of calcium soluble in acetic acid 108
- Dutton W F use of gelatin in medicine 111
- Duval G preservation of cherry laurel water and solution of hydrocyanic acid by paraffin oil and vaseline 71
- preservation of cherry laurel water and solution of hydrocyanic acid by paraffin oil and official vaseline 227
- Duval R dangers in aurotherapy 249
- Dyer F J use of rabbits in the standardization of parathyroid hormone 245
- biology for pharmaceutical students 334
- note on inorganic biochemistry 289
- Dynewicz H A study of vehicles for medicines 25
- Dynewicz J M study of vehicles for medicines 25

E

- Eckert R determination of methyl salicylate according to D A B VI 221
- Eddie B recent studies on psittacosis 154
- Edel E elimination of uric acid from rats liver by action of cinchophen and tolysin 28
- Edens F assay of preparations of digitalis in man 184
- Edmonds S M separation and detection of cyanide 64
- Eisner M comparison of value of merthiolate and phenol as preservatives for diphteria toxoids 96
- El Asreey I contribution to the pharmacology of syntropin 247
- Eldering significance of bacteriological methods of diagnosis and control of whooping-cough 47
- Ellman P agranulocytosis with Purpura hemorrhagica following cold therapy 341
- Ellman R effects of sodium amylal on erythrocyte count following hemorrhage 87
- Elmg L A some effects of alpha dinitrophenol on pregnancy in white rat 83
- Emmanuel E Chios turpentine 4
- Emmatt C W Badianus Manuscript an Aztec pharmacopoeia 332
- Engesleben polarization in the apothecaries laboratory 312
- Englehardt W hypersensitivity of skin to balsam of peru 88
- Ensink A determination of chlorate in potassium chlorate and sodium chlorate 312
- Eppson H phytochemical notes No 112 preliminary chemical examination of *Corydalis aurea* 53
- Epstein I M use of cavitamic acid (ascorbic acid) in the treatment of infantile scurvy 34
- Epstein J A electrometric determination of bromine in the presence of large amounts of chlorine 298
- Erdoes J preparation and chemical composition of synthetic analeptin 142
- assay of liver and stomach preparations 338
- Eschenbrenner H therapeutic use of dextrose 35
- action of pepsin especially in pepsin wine 311
- sterilization in pharmaceutical practice 97
- use of zepphol in the preparation of sterile solutions for injection 98
- zepphol new disinfecting agent 37
- Eu Hsiang Chao studies on wei ling sei 159
- Evans E I antioxidant properties of vegetable lecithin 53
- Evans G cinchophen poisoning 31
- Evans H M clinical manifestations of dysfunction of anterior pituitary 57
- Evans H N growth hormone of anterior pituitary 289
- Evans W E Jr fate of mannide and isomannide in the animal body 244
- Evers N characters of halibut liver oils 281
- Favard V acidum acetum 54
- Ewert E E use of acetylbetamethylcholine chloride in treatment of neurogenic bladder and allied conditions 34
- Eymer H use of radium and mesothorium in treatment of non malignant hemorrhage 350

F

- Fabian A A methods of determining blood iron comparison of wet and dry ashing 57
- Fabian F W Aerobacter aerogenes as cause of ropiness in maple syrup 52
- Fabicki J eye ointments 79
- Fabre R importance of fluorinated methemoglobin in the determination of fluorine in industrial by gene 224
- new apparatus for measuring ultraviolet absorption 316
- Fagny H hair lotion 178
- hair lotion 234
- Fahmy I R *Withania obtusifolia* V Tack and W somnifera Dunal 226
- Euphorbia prunifolia* Jacq 225
- Orobancha ramosa* L 226
- Fang C T use of benzylephedrine as analgesic in chaulmoogra injections 34
- Fantus B study of vehicles for medicines 25

- Farni P method of extracting active principles of *Adonis vernalis* 282
- Faris B T reduction studies in morphine series VI hydrogenation of alpha and beta isomorphines 3
- Farmer L H the highly unsaturated acid of the kernels of *Parinarium macrophyllum* 281
- the highly unsaturated acid of the kernels of *Parinarium laurinum* 281
- Farrell M studies on the respiratory mechanism of streptococci 98
- Farrington H brief study of ipecac 349
- Fatome M determination of glycerol in the presence of sugars by means of periodic acid 122
- Faure A determination of caffeine in decaffeinated coffees 299
- Fay K identification of constituents of red sandal wood pterocarpin 6
- Fehder P drug extraction IV effect of variation in solvents on the extraction of jalap 321
- Fehrlé A organic arsenic compounds 56
- Feigl F detection and determination of copper in pharmaceutical preparations 11
- Feigl F identification of lard in pharmaceutical preparations 124
- detection of organic compounds by means of spot reactions 17
- (1) detection of acetic acid by formation of indigo (2) detection of methyl ketones by conversion to indigo dyes 170
- Feist K bitter principles of calumba root 210
- Felix A new antityphoid serum 96
- Felton L D antigenic characteristics in man of certain products of the pneumococcus 97
- Fenske M R viscosity of petroleum products 15
- Ferchle German apothecary Faenza of the renaissance 79
- Fernholz E behavior of sterols toward digitonin 224
- Ferrari J separation of etrones from urine isolation of α folliculin from urine of the horse 114
- Ferrey G J W determination of ferrous iron in presence of organic matter by Heissig's method 304
- Ferrosan A preservation of fish liver for oil production 71
- Fialko I A researches on the modification of the physicochemical properties of colloidal silver (protargol) with the length of time of its preservation 227
- Field J 2nd effects of 2,4-dinitrophenol on respiration of commercial cake yeast 139
- 2nd effect of repeated washing on stimulation of yeast respiration by 2,4-dinitrophenol 163
- Field S M effects of 2,4-dinitrophenol on respiration of commercial cake yeast 139
- Fine J modification of Benedict's test 212
- Finnemore H determination of hydrocyanic acid in plants 123
- Fischer H treatment of acute hypnotic poisoning 342
- Fischer L leaf oils of the Washington conifers VII *Juniperus occidentalis* 278
- Fischer P microchemical detection of monosaccharides 66
- Fischer R identification of strophanthin g- and k by microchemical test 128
- identification of benzoic and cinnamic acids in micro sublimates of balsams and resins 297
- microchemical detection of coumarin and nicotine 317
- Fischl V chemotherapeutic testing of arsenic acid N (p-dimethylaminobenzal) 90
- Fisk R T experimental rabies in white mice and attempted chemotherapy 87
- Fianzy M methods for detection and determination of methanol in natural media and liquids 125
- new method for the determination of small quantities of methanol in presence of very large quantities of ethanol and its homologues 306
- Fleck H R detection and determination of triethanol amine 19
- Fleming R experimental studies in alcoholism IV attempts to modify the concentration of alcohol in the blood after intravenous administration of alcohol 240
- Fléry P determination of glycerol in the presence of sugars by means of periodic acid 122
- Flaschenträger B action of substances isolated from croton oil 184
- Floderer I determination of esters of p-aminobenzoic acid 118
- Flury F folnerin 210
- Fodor M E absorption of vitamin D through the skin 197
- Fogg W S pharmacological action of pukateine 246
- Fonzes Diacon triple poisoning by arsenic 172
- Foot H W modified iodimetric method for determining copper 119
- Forbes J C comparative studies on the utilization of different magnesium salts 187
- Fornet R peppermint oil from black mint cultivated in southern Sweden 161
- Forsee W T Jr acyl derivatives of ortho amino phenol 103
- Francois M actual situation of production of oils of Flacourtiaceae in view of their utilization in therapeutics 49
- Frank R effects of eserine and acetylcholine on gastro intestinal motility in normal dogs 86
- Frank R T an improved method for determination of gonadotropic hormone 187
- Frank K W effect of certain salts on enzyme activity 7
- Frantzetti C O use of vitamins A and D and camphor oil in the treatment of burns 354
- Frehden O application of spot reactions to detection of organic compounds 127
- Freise F W Brazilian Cedro wood oil 4
- analysis and therapeutic action of *Bixa Orellana* L 20
- Brazilian drugs in world commerce 172
- distribution of ipecac alkaloids in the Rubiaceae 207
- essential oils from Brazilian Euphorbiaceae 204
- essential oil from mushrooms 104
- mydratics and myotics from Brazilian flora 273
- French R B antioxidants and the autoxidation of fats 209
- Freud J crystalline testicular hormone 292
- Freudenberg K sulphur in insulin 291
- Freudweiler R extract of *Aconitum napellus* chemical composition and physiological assay of aconite 82
- Freyberg R H quantitative study of renal injury in a case of acute poisoning by bichloride of mercury 250
- Fridli R concerning important poison cases 89
- Fries W fungi 47
- Fröhlich A sedatives and hypnotics 246
- Furth O elimination of uric acid from rats liver by action of cinchophen and tolylsin 28
- Fujita M anatomy of the drug Chih Mu 317
- Fujita N anatomy of the drug Chih Mu 317
- Fulmer E I analysis of acetone n butanol and ethanol in aqueous solution 214
- Fulton micro detection of heroin 305
- Funk F preparation of tenacious cream or water slave 72
- Furrer M contribution to the chemistry of gamboge 278

G

- Gärtner apparatus small scale suppository mold for pharmaceutical machinery 232
- Galdabek J K standardized vitamin and organo therapeutic preparations the question of their unrestricted commerce in the wholesale pharmaceutical trade 335
- Gallagher J use of convalescent measles serum to control measles in preparatory school 154
- Gallagher T F assay for the testicular hormone by the comb growth reaction 339
- Gallier R antirachitic action of phosphated iodotannic syrup 86
- peculiar action of phosphorus in treatment of rickets 86
- Gangadharan A oil of *Sarcostigma kleinii* 281
- Gangi J quantitative determination of small amounts of arsenic 217
- Gaponenkov T K accumulation of ethereal oil in *Salvia sclarea* of Central Asia 279
- accumulation of thymol in *Trachyspermum copticum* Linc 280
- Garbutt H R resorcinol (fructose) reaction in cerebro spinal fluid 116
- Gardner A D antigens of cholera group of vibrios 269
- Gardner J H relation of pH and surface tension to activity of local anesthetics 243
- some colored local anesthetics 109
- Garlough F E antidotes I general plan 31
- application of statistical methods to pharmaceutical research IV methods of recording drug action 338
- Garnier R determination of ethyl and methyl alcohols in natural essential oils 303
- Garratt D C detection of Japanese mint oil in peppermint oils 223
- Garrelon L action of atropine on reanimation of heart in secondary chloroform syncope 249

- Garrod L P fallacies and dangers in attempted chemical disinfection 203
laboratory testing of disinfectants 2
testing of disinfectants in the presence of organic matter 270
- Gartside H sterilization of solutions for injection 231
- Gaspar T sensitive reagent for aluminum separation of aluminum and beryllium 216
- Castel A J P yohimbine 208
- Gattefosse R M hormone and vitamin cosmetic creams 328
- Gatty Kostyl M structure of ointments 175
- Gaudin O relative toxicity of pyrethrin I and pyrethrin II 189
action of pyrethrins on marine animals 246
comparative toxicity of pyrethrins with respect to different classes of animals 342
- Caume J orthophosphoric acid migration phenomena in the course of hydrolysis of the three mixed diesters 275
- Gebhardt L P nature of formalin inactivation of bacteriophage 152
- Geeraerd use of gold salts in treatment of pulmonary tuberculosis 348
- Geiger A J anti anemia potency of liver after gastrectomy in swine 80
- Geiger J C case of poisoning by dinitrophenol with recovery 88
intravenous use of methylene blue in the treatment of cyanide and carbon monoxide poisoning 36
- Geiger M determination of copper in organic matter 64
- Geiling E M K posterior pituitary 60
- Gerbus H chronic carbon monoxide poisoning 250
- Gernow J T use of acetylthetamethylcholine chloride in treatment of neurogenic bladder and allied conditions 34
- Gerritz H W digesting biological materials for calcium and phosphorus analysis 217
rapid method of preparing biological materials for phosphorus determinations 67
- Gershenfeld L medical works of Maimonides and his treatise on personal hygiene and dietetics 26
teaching urinalysis to students of pharmacy 181
- Gerstenberger H J *et al* antirachitic cow's milk comparative study of antirachitic value of irradiated cow's milk and of milk produced by cows fed irradiated yeast 113
- Gervay V decomposition of acetylcholinesterases 214
determination of hexamethylenetetramine and its decomposition in aqueous solutions 220
- Geschickter C I occurrence of gonadotrophic and estrogenic principles in myoma of uterus 7
- Gestau P rotatory power of various alkaloids 295
- Gettemüller G D latherless shaving cream 76
- Getz C A destruction of organic matter in plant material by the use of nitric and perchloric acids 222
- Ghosh H treatment of cholera with new anti cholera serum 2
- Giacolone A relations between chemical constitution and taste 239
- Gibbs E L effect of ergotamine tartrate on cerebral circulation of man 29
- Gibbs E M modified cinchona alkaloids Part II 275
- Gibbs F A effect of ergotamine tartrate on cerebral circulation of man 29
- Gieseking J E destruction of organic matter in plant material by the use of nitric and perchloric acids 222
- Gillman A E carotenoids of butter 57
vitamin A active substances in egg yolk 60
- Gillet F H hints and formulae for making tablets on a small scale 324
- Gilman A effects of phenacetin and aspirin respectively upon action of phenobarbital 245
- Gion L determination of carbon dioxide in confined atmospheres 299
- Giroux J histologic study of *Grindelia robusta* Nutt 70
- Gismondi L S pregnancy diagnosis 164
- Gisvold O sterols from *Monarda fistulosa* phytochemical notes No 111 108
sterol from *Pinus sabiniana* phytochemical notes No 113 109
- Githens T S studies on venoms of North American pit vipers 343
- Glass N preparation and properties of iodoform and thymol iodide 266
- Glatzel H acute somnifen poisoning 32
- Glenny A T *Staphylococcus* toxins and antitoxins 165
- Godbole N N oil of *Sarcostigma kleinii* 281
- Gonard P relation of toxicity to mode of administration 251
- Gold D stability of ethyl ether U S P 111
- Gold H contribution to pharmacology of nicotine 245
stability of ethyl ether U S P 111
- Goldberg M W testicular hormones clarification of constitution of androsterone 116
- Goldheim S I latherless shaving cream 76
- Goldie H purification and concentration of diphtheria anatoxin 269
- Gonsiorek M F hemolytic streptococci in erysipelas 163
- Goodman H quantitative estimates of hydrogen sulphide in lotions used in treatment of acne 13
allergy 343
- Goodman L anti anemia potency of liver after gastrectomy in swine 80
- Goodwin T H crystalline structure of sugars Part I 284
- Gordon I B virus adsorbed to alumina gel for production of antipoliomyelitis serum in sheep 45
- Gordon M B toxic reaction to alpha dinitro-o-cresol 340
- Gordon S M cooperation between dentists and pharmacists 81
- Couderehet M G gathering of civet 22
- Graessner J B inhalation of adrenaline for the relief of asthma 343
- Graf P estimation of the water content of lard 124
- Gray I recent progress in the treatment of plumbism 32
- Gray J P intravenous use of methylene blue in the treatment of cyanide and carbon monoxide poisoning 36
- Green C W toxin 343
- Green L effect of dyes on colonies of certain pathogenic fungi 46
- Greenbaum F R separation of tung oil from cystine 129
value of sodium morrhuate and quinine in the treatment of varicose veins 351
- Greenberg D M colloidal calcium phosphate of blood serum and calcium partition in serum 57
- Greene A E teaching urinalysis to students of pharmacy 182
- Greenwald C K vitamin C and diphtheria toxin 155
- Greep R O separation of anterior thyrotropic hormone of pituitary 59
- Greger H value of picrotoxin in basal narcosis 195
- Gregoire F contribution to the study of official mineral oils 308
- Griebel detection of narcotics in sense of opium law 67
- Griebel C results of the examination of remedies nostrums and cosmetic agents 313
- Griinger S saponins of *Chenopodium ambrosioides* L 51
- Gingaut A determination of indoxyl content of urine and blood serum 292
- Gnot C minimum emetic dose with adonisin 183
- Gross J blood sugar curves in normal and diabetic dogs after intravenous injections of insulin 139
- Gross P micro heat conductivity apparatus for gas analysis 122
- Gruber C M action of apomorphine upon small intestine in non anesthetized dogs 84
comparative study of actions of morphine and dihydromorphine (dihydromorphine hydrochloride) on intact small intestine of dog 30
- Grynfeldt triple poisoning by arsenic 172
- Gstimer F preparation of aqueous extract of speac 322
- Guenther E S a survey of production and characteristics of estragon and hyssop 278
survey of oil of myrtle 279
sweet basil oil 209
- Guillaume A preservation of cherry laurel water and solution of hydrocyanic acid by paraffin oil and vaseline 71
caffeine content of decaffeinated coffees and value of decaffeinated coffees in nutrition 63
distillation of aromatic waters for determination of volatile constituent 9
preservation of cherry laurel water and solution of hydrocyanic acid by paraffin oil and official vaseline 71
- Guillot J fluorescence of olive oils influence of pigments 126
vegetable oils absorption of ultraviolet light as function of commercial treatment 129
- Guan C aseptic dispensing cabinet 179
- Gupta J quinaldine acid as a micro reagent II estimation of copper and its separation from cadmium manganese nickel cobalt etc. 126

- Curd M R use of pigeons in the assay of liver preparations 157
- Gwatkin R toxic principles of *Brucella abortus* I preparation toxicity and biochemical nature of alcoholic precipitate 53
- II
- Haag H B effect of caffeine and theobromine upon digitalis toxicity 191
- Haas K German homeopathic pharmacopoeia 24
- Habs H atophan poisoning 191
- Haccou A F *Jaya citronella* oil 160
- Haddad D Y, *Withania obtusifolia* V Tack and W sommers Dunal 226
- Hagelstein I preparation of concentrated opium D A B VI in the drug store and critical evaluation of the D A B VI method of preparation and assay 311
- Hagen history of the apothecaries in Landau (Pfalz) 332
- Hahmann poisonous species of star anise 319
- Hahn F L detection of very small quantities of ethyl bromide in blood and brain tissue 317
- Haines W H essential oil industry in Seychelles 103
- Halditch T P component glycerides of piqui A fats 161
- Hall G F effect of sterilization on calcium chloride solutions 153
- Halstrom F quantitative determination of strychnine and quinine in mixtures 315
- Hamann G preparation and testing of spirit of ethyl nitrite 315
- Hambourger W E ratio of toxicity of acetanilid to its antipyretic activity in rats 240
- Hamet R effect of quinine on circulatory system 139
- antagonism of corzanthine to epinephrine 184
- concerning some pharmacological effects of ergo metrine 337
- new physiological property of colchicine 183
- non modification of the sympatholytic action of yohimbine by the introduction of a double bond 340
- Hampshire C H assay of strong ointment of mercuric nitrate 169
- Handle K determination of morphine in tincture and extract of opium 309
- determination of cresol content of cresol soap solution 302
- Hanner A solution of aluminum acetate G P VI 314
- Hansen K research on the content of heavy water in mineral waters 274
- Hanson A M biological effects of active thymus and pineal extracts 88
- Hanzal R F method for the estimation of serum iron 116
- Harde E vitamin C and diphtheria toxin 155
- Harger R N extent of absorption of alcohol at various intervals after oral administration 183
- effect of certain drugs on the metabolism of ethyl alcohol 243
- Harms H P toxicity of quinine quinine hydroquinidine and hydrocinchonidine in guinea pig 87
- Harne W G contribution to the pharmacology of trichlorethylene 248
- Harms S E chlorinated and brominated hydroxy biphenyls 55
- study of germicidal and antiseptic activity of some mercury compounds 163
- therapeutic substances derived from unsymmetrical diphenyl compounds III some aryl esters of the hydroxy diphenyls 337
- Harrison J A virus adsorbed to alumina gel for production of antipoliomyelitis serum in sheep 45
- Harrower G use of lipiodol as a therapeutic agent 349
- Hart G H gonad stimulating product 163
- Hart M C some organic mercurials 154
- Hartley F determination of metallic iron in presence of iron oxides reduced iron 167
- Hasegawa Y constituents of *sapucaia* oil 281
- Haslinger E H toxic reactions of bromides 250
- Hatcher R A quantitative determination of alkaloids with bromine 118
- Hatcher R L quantitative determination of alkaloids with bromine 118
- Hattenstein A history of cosmetics in recent times 332
- history of cosmetics in modern times 79
- history of cosmetics in recent times 181 238
- Hazard R comparison of toxicity and general actions of natural and synthetic camphor on guinea pig 27
- Hazard W R detection of provoked galactose in urine according to technique of Fiesinger and application of method of Fleury and Marque 12
- Hecht F, quantitative microdetermination of copper 166
- Hedström H bacteriological control of water 47
- Heede A partition of phenol between olive oil and serum in acetic fluid 164
- Hegland J M A titration of barbitals with silver nitrate 9
- Heilbron I M carotenoids of butter 57
- vitamin A active substances in egg yolk 60
- Heim E reactions of solutions of cocaine on sterilization and storage 48
- Heinz B investigations in combating syphilis and malaria 196
- Hellbach R apparatus for the application of submerged mold fermentation under pressure 204
- Heller H insulotropic hormone of intestinal mucosa duodenum 212
- Hellwege H product of reaction of carbohydrates in the determination of beechwood lignin 50
- Henderson V F antipyretics 252
- Hendry J revision notes on British Pharmacopoeia 133
- Henry T A apokinine and apokinidine 206
- anti malarial drugs of natural origin 343
- modified cinchona alkaloids part II 275
- Herbain M detection of provoked galactose in urine according to technique of Fiesinger and application of method of Fleury and Marque 12
- Hercus C L skin sensitivity to bichromate 183
- Herd M assay process for potassium iodide 16
- Herrick H T apparatus for the application of submerged mold fermentations under pressure 204
- Herrmann W preparation of gold sol for liquid analysis 305
- Herrold R D use of acetyl betamethylcholine chloride in treatment of neurogenic bladder and allied conditions 34
- Hertz R hypnosis anesthesia and toxicity of evipal 186
- Herwick R P effect of amidopyrine on leucocyte count 183
- Herzog R chemical and physiological study of amines and diamines with ethylene grouping 54
- Hetzler J determination of saponification number in oils 313
- Heubum R refining castor oil 280
- Heyl G constituent of *Microsechum helleri* Tand (*Pseudosechum* Rand) 283
- Hilditch T P composition of commercial palm oils IV progressive hydrogenation as an aid in the study of glyceride structure 106
- Hillig F determination of butterfat in food 298
- Hilpert R S presence of lignin in leaves 52
- product of reaction of carbohydrates in the determination of beechwood lignin 50
- Himmelbaur W fluctuation of drug potency during growth 205
- pharmacognostic study of Composite flowers 70
- pharmacognostic study of Composite leaves V 318
- Hintzelmann U contribution to the determination of preparations of allium 241
- Kitchens R M assay methods for salts of organic acids 17
- Hitchings F W treatment of chronic vaginitis with phenylmercuric nitrate 36
- Hjort A M employment of potassium ferrocyanide in standardization of dilute potassium permanganate 68
- relative anesthetic effects of various ureas 248
- Ho K iodine value of tung oil 129
- Hoch J H patent medicines 80
- Hocking G M methods of identification of rhizomes of *Iris versicolor* L and *Iris virginica* L 21
- Hok W stability of solutions of iodine 221
- Höll K determination of lead in drinking waters 167
- Hofman J J determination of chlorate in potassium chlorate and sodium chlorate 312
- Hofmann R nephelometric determination of small quantities of nicotine 309
- colorimetric assay of morphine 308
- Holander L dermatitis due to phenol 89
- Holck H G O sex difference in white rat in tolerance to certain barbiturates 84
- Holdsworth Haines W H patchouli oil of the Seychelles 161
- Holl K detection of pine oil in oil of turpentine 310
- Hollman E C M J international method for determination of morphine in opium 126
- Holm A isolation of virulent and highly toxic strain of *C. Diphtheriae* 153
- Holmes A D iodine content of cod liver oil 50
- Holmes G toxicity of injections of gold 88
- Homgeschmidt O fifth report of committee on atomic weights of the International Union of Chemistry 156

- Horder L Review of British Pharmaceutical Codex 73
 Horel J chemical method for rapid determination of alkaloid content of sweet lupines for breeding 315
 Horn Z some thiazol derivatives of ω chloroacetylpyrocatechol 55
 Horkheimer P stability of hydrogen peroxide solution 323
 estimation of etheral oils in drugs 122
 syrup of ferrous iodide 316
 Horn D W new type lactometer reading total solids 221
 Horning bacterial action of azochloramid 45
 Horst K effect of caffeine coffee and decaffeinated coffee upon blood pressure pulse rate and simple reaction time of men of various ages 183
 effect of coffee and decaffeinated coffee upon tremor in normal men and women 239
 Horwitz S intrapleural injection of salyrgan 189
 Hoshino T synthesis of phystigmine 208
 Hou H C comparison of oral and subcutaneous administration of protective doses of ascorbic acid (vitamin C) 241
 Howell W J use of hydrochloric acid in tonsillitis 36
 Hoyt A experimental rabies in white mice and at tempted chemotherapy 87
 Hrynakowski K fusion curves of binary systems bromural and veronal with salol and phenacetin 98
 Hsu C chemical study of Haijen tsao (Digenin simplex A_4) 210
 Hubbard R S resorcinol (fructose) reaction in cerebrospinal fluid 116
 Van Der Bergh reaction of bilirubin variations in xanthochromic cerebrospinal fluid 60
 Hudson, N P virus adsorbed to alumina gel for production of antipoliomyelitis serum in sheep 45
 Hug W use of octinum in smooth muscle spasm 350
 Hughes W J sugar comparison of reducing sugar methods 17
 Hulpien H R extent of absorption of alcohol at various intervals after oral administration 183
 effect of certain drugs on the metabolism of ethyl alcohol 243
 Hupper O carcinoma as an electrical phenomenon of protein substances 192
 Husa W J drug extraction III function of preliminary maceration in relation to the percolation of belladonna root 320
 drug extraction IV effect of variation in solvents on the extraction of jalap 321
 drug extraction II the effect of fineness of powder and of variation in solvents on the percolation of belladonna root 227
 history of calcium lactophosphate preparations 26
 stabilization of solution of iron and ammonium acetate U S P X 72
 stabilization of syrup of hydriodic acid U S P X 24
 Hveding J research on the content of heavy water in mineral waters 274
- I
- Ide powder for treatment of pyorrhea 350
 Imaz E C minimum emetic dose with adomidin 183
 Inouye K tensile strength and density of paraffin wax at various temperatures 222
 Ionesco C N biochemical studies of β cyclopentyl and β cyclohexyl glucosides 110
 Ionescu Matiu A study of the alteration of medicinal products by pH determinations 188
 determination of alkaloids application of the mercurimetric method to new biological products 215
 Isaëls M C G treatment of lymphatic leukaemia 194
 Issekutz B biological determination of alkaloids of ergot 189
 point of action of thyroxin 190
 Issekutz B Jr point of action of thyroxin 190
 Istin theory and physico chemical basis of colorimetric methods of analysis 301
 Ivanov F I sphagnum and its therapeutic use 351
- J
- Jackson D E pharmacological action of methylamino methyl heptene 244
 Jackson R F chemical methods for reducing sugars 172
 Jacobsen A alkaloid content of cinchona bark and cinchona decoctions 11
 Jacobsen J P mean deviation of functions of correlated observations and of uncorrelated observations as applied to tablets 181
 James S P chemotherapy of malaria 349
 Jaretzky R alkaloidal content and activity of saprophytic ergot cultures 270
 investigation of cardiotonic drugs 282
 Jarotzky A T new method of treatment of diphtheria with antitoxic serum 45
 Jatrudes D determination of alkaloids in injectable solutions 294
 Jeans P C retention of calcium by infants fed evaporated milk containing cod liver oil concentrate 346
 Jenkins G L assay of National Formulary preparations containing bismuth 298
 Jenkins W I effect of caffeine coffee and decaffeinated coffee upon blood pressure pulse rate and simple reaction time of men of various ages 183
 Jerstad A determination of alcohol in tinctures 215
 color of glass used to protect from light 323
 Jha J B potentiometric estimation of copper 120
 Joachimovits R review of sex hormones 116
 Johnson I I pharmaceutical study of pH 175
 pharmaceutical study of pH 229
 Johnston W R determination of alpha amylase 215
 Jones R R symptoms in early stages of industrial plumbism 32
 Jones W S shark liver oil 107
 preservation of halibut liver oil with hydroquinone 209
 Jonnard R chronic lesions produced by α -dinitrophenol 250
 Jordan C O special variety of staphylococcus concerned in food poisoning 97
 Jorgensen P S vegetable extracts and blood sugar 190
 Joseph L some colored local anesthetics 109
 Josephson C M effect of adrenal cortex hormone on hypertension and on cardiovascular system 34
 Joslyn M A browning of orange juice 23
 effect of cold and freezing storage on the composition of wine 24
 Jossierand A soluble chemical products in which iron is associated with vitamin C action on tumors on intravenous injection 354
 Jozsa S determination of alpha amylase 215
 Julian P L studies in indole series complete synthesis of phystigmine (eserine) 102
 Julien I practically neutral solution of adrenaline (1-1000) with good keeping qualities 231
 Jung J W biological evaluation of the male sex hormone 338
 Jungblut C W inactivation of diphtheria toxin *in vivo* and *in vitro* by crystalline vitamin C (ascorbic acid) 183
 Jungkuz R oil of hawthorn fruit 106
 Junst A E preparation and properties of 3,3-bis(azometa phenylenediamine) 4,4'-dihydroxyarsenobenzene and 3,3-bis(azo 2,6-diaminopyridine) 4,4'-dihydroxyarsenobenzene 211
 Justiniano A determination of quinine in chocolate tablets 16
- K
- Kalaschmikov N P emulsifying and coating properties of cherry gum 134
 Kalin A preparation of steril distilled water in a vacuum 174
 Kaltschmidt T pharmacognostic study of Composite leaves V 318
 Kaltschmitt H isolation of lacto flavin (vitamin B₁) from hay 58
 condition of vitamin B in cow's milk 61
 Kamei H Euphorbia prunifolia Jacq 225
 Kamienski B structure of ointments 175
 Kamski S harvesting time for *Nicotiana rustica* 156
 Kanan M A sex difference in white rat intolerance to certain barbiturates 84
 Kanegahuchi Boseki K K glycyrrhizin 210
 Kantner L M professional outlook 82
 Kanyone T volatile constituents of *Cymbopogon georgiu* 49
 constituents of sapucaína oil 281
 poisonous constituents of *Conium japonica* A Gray 284
 Karling E simple method for determination of glucose in urine 184
 mixtures of zinc oxide and olive oil 181
 Karpur S N hygroscopicity of tree barks 173
 Karrassik V value of sodium nitrite as antidote to hydrogen sulphide 89
 Karrer P vitamins 164

- Karrer, W flavones from digitalis 53
 Karsmark, K A testing of tragacanth 129
 Karstin A advances in luminescence analysis 168
 Kashiwagi, K, poisonous constituents of *Coriaria japonica* A Gray 284
 Katz, J history of homeopathy 238
 Kausch, O quantitative determination of insulin in fluids tissues etc 20
 evaluation of insulin preparations 86
 Kawana, T on the constituents of *Hydrangea paniculata* and on *hydrangin* 284
 Kayser, F determination of lactic acid 306
 Keblir, L F United States patents granted for medicines during the pioneer years of the patent office 238
 Kehoe, R A normal absorption and excretion of lead 31
 Keith, N M diuretic action of potassium salts 246
 Kelbly, H G *acacia* 26
 Keller, G sources of cloves 70
 Kelly, E F brief history of the drug code 334
 Kendrick, significance of bacteriological methods of diagnosis and control of whooping cough 47
 Keresztesy, J C studies of crystalline vitamin B₁ cleavage of vitamin with sulphate 61
 Kergonou, E elimination of strychnine and barbiturates 189
 Kern, W pharmaceutical emulsions 321
 physiological chemical investigations and sterilization methods in pharmaceutical instruction and operations 323
 Kerslake, E J persistence of tetanus antitoxin in man 273
 Keus, K clinical experience with calcibronat 192
 Kharasch, M S ergotocin 101
 Kharasch, active principle of ergot responsible for the oral effectiveness of some ergot preparations on human uterus 458
 Kilde, C measurements with the glass electrode 274
 Kilmer, F B values of history in drug store 26
 King, F E experiments on the synthesis of physostigmine (eserine) part XI 276
 King, H curare 158
 Kingsepp, G an injectable preparation of bismuth leucis 241
 Kirch, E potassium guaiaccol sulphate 287
 Kirk, P L volumetric microdeterminations of chloride and potassium ions 218
 Kirshhof, C A arspenamine 162
 Kjellmark, S determination of the viscosity of viscous extracts 304
 Klee, P use of protosil in streptococcal infections 195
 Klein, S J solubility of pneumococcus in saponin 272
 Kleiner, I S investigation of the new biologic test for hormones in pregnancy urine 290
 Klumek, R cobalt nitrate as a reagent for pharmaceutical purine preparations 171
 Klobustitzky, micromethod for the identification of strychnine salts 315
 Klotz, L J stabilization of syrup of hydriodic acid U S P X 24
 stabilization of solution of iron and ammonium acetate U S P X 72
 Knaysi, G microscopic method of distinguishing dead from living bacterial cells 268
 Knight, R T cyclopropane anesthesia in obstetrics 346
 Knight, W A Sinclair's glue 25
 Codex and public pharmacy 325
 Koch, F C assay for the testicular hormone by the comb growth reaction 339
 Kochmann, M assay of follicular hormone in commercial preparations 187
 Kocsis, E J qualitative examination of ointments and similar preparations by means of filtered ultra violet light 126
 Koeng, A sodium hexametaphosphate in skin diseases 351
 Kohman, E F availability of calcium in foods containing oxalates 289
 Kohn, C M evaluation of use of quinidine sulphate in persistent auricular fibrillation 92
 Kolthoff, I M value of calcium hypochlorite as volumetric oxidizing agent stability and standardization of solution of calcium hypochlorite Determination of ammonia 62
 Konowalowa, R. harmonic and harmonic II nitro and amino derivatives of *o* alkyl ethers of harmol and harmolol 101
 Konstantin Hansen, B oestrin and luteohormone 8
 Kopaczewski, W physical characters of lactic acid in course of aging 56
 Korenman, I M, use of indigocarmine in microvolumetric analysis 305
 microdometric determinations 307
 Korzina, O I arspenamine, 162
 Kotake, Y, synthesis of physostigmine 208
 Kotwal, R D solution of bismuth and ammonium citrate B P C 1934 231
 Krantz, J C, Jr note on the assay of reduced iron 14
 contribution to the pharmacology of trichlorethylene 248
 fate of mannide and isomannide in the animal body 244
 study of the anesthetic properties of trichlorethylene 340
 Kress, R *Viscum album* L 310
 Kner, G K. cinchona plant in Russia 273
 Knes, W glucosides of *Digitalis purpurea* 51
 Krsel, H two cases of murder by thallium 172
 Kruber, O isolation of 1,2 dimethyl naphthalene from coal tar 55
 Krumbholz, P detection and determination of copper in pharmaceutical preparations 11
 Kufferath, A conception value and measurement of μ h 311
 Kuhn, A homeopathic tinctures of atropine group 71
 homeopathic preparations VI evaluation of saponin containing tinctures 123
 Kuhn, R lacto flavin in N/20 6,7 dimethyl 9 L-arabo flavin 57
 condition of vitamin B₁ in cow's milk 61
 dimethyl flavin 6,7 dimethyl flavin 9 acetic acid 58
 isolation of lacto flavin (vitamin B₁) from hay 58
 natural and synthetic lumi lactoflavin 59
 optical activity of lactoflavins 65
 synthesis of vitamin B₁ phosphoric acid 61
 Kulberg, L M drop method of detection of copper 301
 Kunde, M M effect of amidopyrine on leucocyte count 183
 Kuntz, E bitter principles of calumba root 210
 chemical method for rapid determination of alkaloid content of sweet lupines for breeding 315
 Kunz, Krause, H galeumatic tinctures of D A B VI intimate knowledge of the tincture 228
 detection of alkaloid-containing poisonous drugs in powdered drugs 294
 Kuo, Chih Lee, D potency of Oregon digitalis 184
 Kurschgen, M degradation of camphors and diketone camphanes in animals 84
 Kussmaul, W β iodohydroxynaphthalenedisulphonic acids 56
 therapeutic bactericidal and antiparasitic organic antimony compounds 93
 Kutschent, M L new spot reaction for caesium 299
 Kuwada, S spectrographic observations on various sapogenins 288
 Kjer, J L charcoal adsorption as a method for the preparation of concentrated liver extract 115
- L
- Lacey, C F absorption of drugs through the oral mucosa 186
 comparison of motor effects on morphine codeine and dilaudid on Thierry fistula 188
 Lamb, I D *Strophanthus* of *Strophanthus emini* 161
 Lampitt, L H twenty five years of food chemistry 163
 determination of copper in foods with special reference to milk 219
 Lamson, P D anthelmintic studies on alkylhydroxybenzenes I alkylpolyhydroxybenzenes 27
 et al anthelmintic studies on alkylhydroxybenzenes II ortho and para alkylphenols 27
 anthelmintic studies on alkylhydroxybenzenes III 6 n alkyl meta-cresols 27
 et al anthelmintic studies on alkylhydroxybenzenes IV isomerism in polyalkylphenols 27
 et al anthelmintic studies on alkylhydroxybenzenes V phenols with other than normal side chains 27
 oral toxicity of 6 alkyl meta-cresols 83
 Lande, P carbon tetrachloride experimental investigation on its toxic action by repeated inhalation 137
 Landsberg, R toxicity of the newer refrigerating agents 251
 Lange, J preparation of trisodium periodate and periodic acid 112
 Langecker, H hormones from urine 290
 Langenhan, H A theory of pharmacy and academic standards 81
 Lansing, A C detection of benzene in alcohol 217
 Lanza, A J epidemiology of lead poisoning 32

- Lapp C specific rotary power of the salts of quinine quindine cinchonine and cinchonidine 277
- Iaqueur E crystalline testicular hormone 292
- Iardé R comparison of toxicity and general actions of natural and synthetic camphor on guinea pig 27
- Larson C I colloidal calcium phosphate of blood serum and calcium partition in serum 57
- Iasoff J L prescription compounding 81
- Iashmet F H quantitative study of renal injury in a case of acute poisoning by bichloride of mercury 250
- Laszlo S chemical examination of arsenobenzene 217
- Laurent L P F effect of large doses of potassium chloride on masthenia gravis 350
- Launay P ultra violet absorption spectrum of benzene utilization for the detection and determination of small amounts of benzene in the atmosphere 297
- Lavallay colorimetric micro and submicro method for the determination of iron 291
- Lavallay M J micro and submicro colorimetric determination of iron 221
- Lavoye levorenine (adrenaline) 207
- LaWall C H physical and chemical investigation of calomel 47
- revolutionary account book of Christopher Jr and Charles Marshall 135
- LaWall M R revolutionary account book of Christopher Jr and Charles Marshall 135
- Lawrence J S agranulocytosis with *Purpura hemorrhagica* following gold therapy 341
- Laybourn R L culture media used for routine diphtheria cultures with a suggested modification of Loeffler's blood serum medium 209
- Lazarus A S comparison of resistance of bacteria and embryonic tissue to germicidal substances I methiolate 46
- comparison of the resistance of bacteria and embryonic tissue to germicidal substances II metaphten 90
- germicidal substances III mercurochrome comparison of the resistance of bacteria and embryonic tissue 153
- germicidal substances IV hexylresorcinol comparison of resistance of bacteria and embryonic tissue 153
- Leamer A effect of amidopyrine on leucocyte count 183
- Leavenworth C S determination of ammonia and amide nitrogen in plant tissue 216
- Le Beau P fifth report of committee on atomic weights of the International Union of Chemistry 156
- Leclercq L assay of diiododithymol 220
- Leclercq J poisoning by arsine 249
- intoxication by trichlorethylene 131
- Leeco R experimental investigations on vitamins B in their relations to glucides proteins and lipids of diet 60
- action of some commercial practices on nutritive value of foods 292
- biological equilibrium and disequilibrium of commercially modified milks 291
- peculiar action of phosphorus in treatment of necklets 86
- purgative action of castor oil and alimentary disequilibrium 239
- Lederer E chromatographic adsorption and its applications 219
- Lee J W accuracy and speed factors in capsules 236
- Lefevre C oxidation of sulphur in organic chemistry application to determination of sulphur 68
- Leffranc C caffeine content of decaffeinated coffees and value of decaffeinated coffees in nutrition 63
- Legault R R ergotocin 101
- ergotocin active principle of ergot responsible for the oral effectiveness of some ergot preparations on human uteri 158
- Legrand G cellulose varnish 233
- Lehmann H preparation of chloral hydrate suppositories 236
- Leison E use of sodium desoxycholate for identification of pneumococci 2
- Leinzinger M biological determination of alkaloids of ergot 186
- LeMar J D studies on the nature of bacteriophage I 268
- studies on the nature of bacteriophage II 269
- Iemetayer E immunizing activity of tetanus toxin in lanolin 98
- Lendle L Baljet color reaction of compounds of digitalis 167
- action of substances isolated from croton oil 184
- Lennox W G effect of ergotamine tartrate on cerebral circulation of man 29
- Lenz O spinal anesthesia in the rabbit therapeutic coefficients 247
- Leonard G F isolation of virulent and highly toxigenic strain of *C. Diphtheriae* 153
- Leonhardt H identification of constituents of red sandalwood pterocarpin 6
- Leopold W pharmaceutical emulsions 321
- Lepine P direct action of methylene blue on *Hansen bacillus* 91
- Lepper W determination of cod liver oil in emulsions 301
- Lerman J action of iodine in thyrotoxicosis 353
- Lerner H fixed color standard for and determination of cholesterol 165
- Leroux L detection of war gases 316
- Leupin K karkade 318
- saponins 6
- Levaditi C curative and preventive action of 4 sulfamid 2,4-diamino azobenzene hydrochloride in experimental streptococcus infection 204
- Levine M some observations on the germicidal efficiency of chloramine T and calcium hypochlorite 269
- Levine S A evaluation of use of quindine sulphate in persistent auricular fibrillation 92
- Ievine V E methods for determining blood iron comparison of wet and dry ashing 57
- differential reactions between carotene and oils rich in vitamin A 130
- differentiation of vitamin A from carotene by means of antimony trichloride 130
- Levy J bioassay of powders of squill 87
- Levinson A new procedures in perfume chemistry 209
- Lewis D occurrence of gonadotrophic and estrogenic principles in myoma of uterus 7
- Lewis W H effect of digitalis on pneumonia 193
- Li R C relationship of potency of digitalis as determined by different methods 242
- cumulative poisoning by lanadign digtoxin and ouabain 243
- Liang P saponins and sapogenins III sapogenins obtained from *Chlorogalum pomendianum* 53
- Lichtman S S influence of bile salts on the nervous system following intraspinal usage 136
- Lindbergh C thyroid glands 340
- Lindenberg A solubility of castor oil distribution coefficient between oil and water of substances completely miscible in two solvents 119
- solubility of ricinolein distribution coefficient between neutral glycerides and water of substances soluble in all proportions in two solvents 127
- Linnell W H determination of metallic iron in presence of iron oxides reduced iron 167
- Linsert O vitamin D transformation of highly potent physiological products with ultraviolet rays 61
- Lippert K M photodynamic effect of methylene blue on tetanus toxin 98
- Iiszevic Draganesc A preservation of chloroform for use in anesthesia 227
- Little E food and drug legislation 26
- how should fundamental courses in chemistry be taught in a college of pharmacy? 135
- Lloyd J T history of hamamelis (witch hazel) extract and distillate 80
- Lloyd J U history of hamamelis (witch hazel) extract and distillate 80
- Loidolt K fluctuation of drug potency during growth 205
- Loizaga N S malaria treatment with Quechua Dominguez 350
- Long M standardization of insulin preparations 29
- Lopez R C determination of small quantities of bromides in sodium chloride 62
- detection of small quantities of bromides in sodium chloride 298
- Lormand Ch rotary power of various alkaloids 295
- Lott W A study of a new series of urethanes 7
- Lotze side reactions of pyramidon therapy 196
- Lowdon A S R testing of scarlet fever toxin and antitoxin by the rabbit intradermal method 272
- Lowry T M tartrates and racemates 7
- Lucia S P effects of tartar emetic on the leukocyte count 140
- Luck J M stimulation of the adrenal medulla by irradiated insulin 139
- Ludlam E B heavy hydrogen 3
- Ludueno F P contributions to pharmacology of candicine 137
- alkaloids of *Cereus coryne* 157
- Ludwig C Sea Sickness Remedy Bayer 196

- Lumière A metallic derivatives of sodium thioethane sulphate in therapeutics 247
humoral medicine and chemistry 200
- Yutz R E reduction studies in morphine series V dihydro and tetrahydro pseudocodeine methyl esters, 3
- Lynn F V vegetable extracts and blood sugar 100
leaf oils of the Washington conifers VII *Juniperus occidentalis* 278
- Lyons D C preliminary evaluation of a solution of cerous ceric chromate in the treatment of Vincent's angina and other oral diseases 353
- M
- Ma Chi Ming constituents of roots of *ch'ai hu* (*Bupleurum falcatum* L.) 284
- MacCorquodale D W crystalline ovarian follicular hormone 114
- Macht D I assay of digitalis on normal and exsanguinated cats 28
action of mercurial antiseptics on muscle oxydase 188
- Mack L effect of amylal and amidopyrine on blood picture of the albino rat after a deficient diet 330
- Madajewa O S derivatives of 8-aminoquinoline as antimalarials IV 252
- Madaus F immunizing preparations 271
- Madaus G immunizing preparations 271
- Madaus H immunizing preparations 271
- Madsen M E H determination of carbon tetrachloride in chloroform 119
- Mahdi M A H *Orobanchae ramosa* L. 220
- Mahen L vermifuge grains of the Combretaceae of Madagascar 274
- Maier E advances in testing of disinfectants 96
- Mair W pharmacy in Denmark 335
- Majer V micropolarographic investigations 308
- Majudson O J derivatives of 8-aminoquinoline as antimalarials IV 252
- Majima A volatile constituents of *Cymbopogon georgianus* 49
- Major R T some recent contributions of chemistry to medicine 103
- Malcolm concentration of scarlet fever antitoxin 46
- Maloney A H hypnosis anesthesia and toxicity of evipal 186
- Malowan S applications of cetyl alcohol in cosmetics 75
- Mannich C new method for determination of morphine especially in opium 66
- Mantz H W problems of the teachers and state board examiners 136
- Marangoni P investigations on cultivated rhubarb 2
- Marcille R study of use of Beller number for the detection of peanut oil in olive oils 297
- Manassiss use of gonococcus vaccine in acute gonorrhea 348
- Marini O pharmacological action of *Digitalis lanata* and *D. purpurea* 28
- Marini C pharmacological investigation of *Digitalis lanata* Ehrh. 242
- Marion D F intestinal motor inhibition by parasympathetic drugs 86
- Markianos J direct action of methylene blue on *Hansen bacillus* 91
- Markwell W A N evaluation of henna 13
assay of Extract of Coca and *Fluidextract of Coca* B P C 304
- Marsh G L browning of orange juice 23
effect of cold and freezing storage on the composition of wine 24
- Martin A W effects of 2,4-dinitrophenol on respiration of commercial cake yeast 139
effect of repeated washing on stimulation of yeast respiration by 2-dinitrophenol 163
- Martin F M chemical study of Sierra Nevada digitalis 21
- Martindale W pharmacognostic study of composite flowers 70
- Masere M bioassay of powders of squill 87
- Matoleky K production and tests of cinchona bark preparations 63
- Matsukawa T saponin of the seed of *Æsulus turgeni* Blume 282
spectrographic observations on various saponins 288
- Matull H A antioxidants and the autoxidation of fats 209
- May O E apparatus for the application of submerged mold fermentations under pressure 204
- McAfee J blood sugar curves in normal and diabetic dogs after intravenous injections of insulin 139
- McClelland J E phases or types of H. Pertussis 271
- McCluer, W B viscosity of petroleum products 15
- McCrear F D intestinal motor inhibition by parasympathetic drugs 86
- McElvain S M, 5,5-diphenylbarbituric acid 212
- McKinlay E B attempts to produce immunity with large quantities of killed herpes virus 97
- McJannet A P history of calcium lactophosphate preparations 26
- McMurray R L volatile oil of *Achillea millefolium* 4
oils of *Artemisia rigida* (Nutt.) Gray 160
volatile oil of *Achillea millefolium* Linné 180
- McNearney, J W spinal anesthesia in the rabbit therapeutic coefficients 247
- Meek H O assay of glyceryl trinitrate tablets 305
- Meek W J cardiac irregularities produced by epinephrine after digitalis 85
- Meluhin R M determination of small quantities of copper 166
- Meijer J thermo analysis and eutectics of medicinal mixtures 306
- Memmesheimer A M toxicity of boric acid preparations skin disturbances through the use of defatting agents containing boric acid 191
- Mendel L B relation of calcium to blood formation 140
- Mercer D picrotoxin part I 287
- Mercier F pharmacologic tests of apiol 83
constituents of the rhizome of *Cimicifuga racemosa* 162
- Merck F E ergot alkaloids 158
- Merz K W toxic constituents of *Tephrosia vogelii* seed 21
chemistry and pharmacology of ergot 276
- Meyer E use of white mineral oil and petrolatum in pharmaceutical and cosmetic practice 130
- Meyer G determination of iron in mardukan 168
- Meyer K angostura bark 70
- Meyer K J recent studies on psittacosis 154
- Meyer R J fifth report of committee on atomic weights of the International Union of Chemistry 166
- Mezey K effect of dinitrophenol on heart 185
- Middleton G improved method for estimation of essential oil content of drugs 220
- Miller E thiobarbiturates 353
- Miller E S rapid quantitative method for the determination of the common carotenoids analysis of beta carotene and leaf xanthophyll in thirteen plant tissues 10
- Miller H G effects of cottonseed meal on stability of vitamin A in cod liver oil 116
- Miller R F introduction of isobutyl groups into phenols cresols and homologous compounds 7
- Millett S assay of National Formulary preparations containing bismuth 298
- Miramanoft A note on sodium perborate 275
- Mirsky I A total ascorbic acid content of human blood method of determination 113
- Mitchell J S case of tetanus treated with curarine 90
- Möbus T action of aqueous extracts of drug plants on *Bacterium coli* and *Aspergillus niger* 270
- Moeller K O ergometrine 158
- Mohr E C J East Indian diatomaceous earth 225
- Mohrschulz determination of barbituric acid derivatives in urine 212
- Moir C alkaloids of ergot ergometrine 348
- Molter H spectroscopic analysis 127
- Mommsen H pharmaceutical emulsions 321
- Moness E chlorinated and brominated hydroxybenzenes 55
attempt to ketonize ergosterol 58
study of germicidal and antiseptic activity of some mercury compounds 163
- Monnet M R identification of the preparations of cinchona by the erythroquinine and thalleoquinine reactions 165
- Montgomery M F effect of amylal upon pilocarpine induced submaxillary and gastric secretion 183
- Moore A W effect of altitude on the action of drugs I strychnine 186
- Moore E E crystalline forms of ephedrine alkaloid 99
- Morawitz P therapeutics of non decompensated heart lesions 194
- Mordell J S innovation in hospital pharmacy practice 26
- Morel A soluble chemical products in which iron is associated with vitamin C action on tumors on intravenous injection 354
- Morgan G T molecular compounds of phenols, 7
- Morgan R S vitamin potency and associated characteristics of average cod liver oil 219
- Morrell C A influence of vitamin C on development of skin sensitivity to neoarsphenamine in guinea pig 88

- Morrison R W comparative study of the absorba-
bility of calcium compounds 137
- Mosetting E benzofuroquinolines 100
- Mosig A ionic reactions as the cause of incompati-
bilities 25
- Moxon A L effect of certain salts on enzyme activity
7
- Moyer H V modified Volhard method for determina-
tion of chloride 10
- Mozsonyi S education of the pharmacist 334
- Mudge C S bactericidal action of chlorine 96
- Müller A average values for surface tensions of es-
sential oils 12
- Müller H chemistry and toxicity of mussel poison 32
- Muller J A identification numbers of drugs and
galenicals V copper numbers of drugs used most
65
- Muller M ergosterol 113
- Munch J C antidotes I general plan 31
application of statistical methods to pharmaceutical
research IV methods of recording drug action 338
saliva tests III detection of the administration of
some opium derivatives to horses 339
the detection of thallium alkaloidal reagents VII
172
thiobarbiturates 353
- Munesada T pharmacognosy of the roots and
rhizomes of two *Scrophularia* species 318
- Muntwyler C effect of 1,2,4 dinitrophenol on oxygen
uptake of rat tissue 139
- Murachver R W regeneration of glycerin in produc-
tion of glycerophosphates 50
- Murdick P notes on the concentration and purifi-
cation of antimeningococcus serum 96
- Musser R contribution to the pharmacology of tri-
chloroethylene 248
study of the anesthetic properties of trichloroethylene
340
- Myers J T studies on the nature of bacteriophage I
208
studies on the nature of bacteriophage II 209
- N
- Nabarrm D treatment of vulvo vaginitis with
oestrin 91
- Nakao M constituents of *Daphne Genkwa* 284
- Narat J K value of brilliant green as a local anti-
septic 153
- Narayanamurti D hygroscopicity of tree barks 173
- Narayanayya Y V simple method for the deter-
mination of nitrogen 126
- Natanson E M researches on the modification of
the physicochemical properties of colloidal silver
(protargol) with the length of time of its preserva-
tion 227
- Nathanson M H action of acetyl beta methylcholine
on ventricular rhythms induced by adrenaline 183
- Natun I hyperglucemia in diphtheria carbohydrate
metabolism and treatment with dextrose insulin
140
- Naves Y R study of citronellol rhodinol isomerism
by means of Raman spectrography 208
presence of methanol and formaldehyde in essential
oils and their ethanolic solutions 303
- Necheles H effects of eserine and acetylcholine on
gastro intestinal motility in normal dogs 86
- Nelson W L value of cinchona alkaloids in pneu-
monia miscellaneous alkaloids and some hydro-
cupreine ethers 85
- Neppi visible test for sterility 272
- Neu R spoilage of fats and oils III rancidity and
constitution of oleic and elaidic acids 50
- Neugebauer H basic demands of homeopathic
pharmacy 136
homeopathic pharmacy in 1934 136
preparation of dilutions according to the Homeo-
pathic Pharmacopoeia 320
- Neumann W Polinerna 210
- Newman H W action of dinitrophenol on rate of
oxidation of ethylalcohol *in vitro* 242
effect of alcohol injected intravenously on habitua-
tion to rate of metabolism 336
- Nichols M L determination of perchlorates 15
- Nicol H value of ultraviolet fluorescence as test for
citrus oils determination of substances producing
the fluorescence 119
- Nielsen K method for the preparation of tablet
granules 324
- Nitzescu I I purification of insulin method for pre-
cipitation of 115
new method for precipitation of insulin 164
rapid method for the determination of purity of
commercial insulin *in vitro* 221
- Noller C R saponins and sapogenins III sapogenins
obtained from *Chlorogalum Pomeridianum* 53
- Norrin G oils of *Artemisia rigida* (Nutt) Gray 160
- Norton J virulence tests for typhoid bacilli and anti-
body relationships in antityphoid sera 152
- Noval E anterior pituitary and anterior pituitary
like substances 289
- Nussle W Jr preparation of tetrahydronaphthalene
peroxide 7
- Nye E E notes on coloring of Glycerinum Thymolis
Rubrum A P F, 134
fluidextract of ergot in a mixture 331
notes on some new preservatives used in pharmacy
154
- Nylander A assay of valenan root and valenan
preparations 340
- O
- Oakley M note on the assay of reduced iron 14
- O'Brien A note on sterilization of oils 155
- Ochsner E H colloidal gold in inoperable cancer
346
- Ockerblad N F effect of morphine on human ureter
188
- Oefein F use of gastro sil in nervous hyperacidty
194
- Oelkers H A study of commercial drugs containing
atropine 206
- Oesterlin H organic arsenic compounds 56
- Offerhaus C special detection of cocaine and novo-
caine anesthetics with reference to smuggled
goods 8
anesthetics with special reference to cocaine and
novocaine in illegal trade 295
- Offord H R rapid test for chlorate ion qualitative
and approximately quantitative test especially
suitable for work with plant extracts 62
- Ogata A *in vivo* action of diodotyrosin I diuretic
action 85
- Ogden C observations on dogs under continued in-
fluence of ephedrine 242
- Olcott H S antioxidants and the autoxidation of
fats 209
- Oleny M B effect of intravenous injections of acacia
on physico chemical properties of blood 82
- Olesk J an injectable preparation of bismuth lectis
241
- Olpp A E camrol 39
- Onischenko A S composition of ethereal oil of *Abies
sibirica* 278
- Onitschchenko A maximum yield of camphor ob-
tained from *Laurus camphora* 155
- Orechoff A harmine and harmaline II nitro and
amino derivatives of o-alkyl ethers of harmol and
harmalol 101
- Orella P R toxicology of hydrocyanic acid 224
- Orlono F soluble chemical products in which iron
is associated with vitamin C action on tumors on
intravenous injection 354
- Orr J medical aspects of British Pharmaceutical
Codes 1934 73
- Orten J M relation of calcium to blood formation 140
- Osborne H G preparation of liver extract 115
- Oser B L critique of 1934 interim revision of text
and assays for U S P cod liver oil 24
influence of ascorbic acid on sensitization of guinea
pigs to neoarsphenamine 84
- Osswald H cellophane and kuprophane as dialysis
membranes 218
- Ostberg O E value of colloidal iodine in medicines
and cosmetics 91
- Østby O determination of alcohol in tinctures 215
color of glass used to protect from light 323
- Ostromislensky I I use of rossium in alcoholism 351
- P
- Page G R assay of strong ointment of mercuric
nitrate 169
notes on some pharmacopoeial tests II chinofon
codine simple solution of iodine sodium phos-
phate 170
- Pagel W the production of Koch's phenomenon with
various strains of tubercle bacilli 271
- Palfrey L determination of ethyl and methyl alcohols
in natural essential oils 303
- Pallu R determination of caffeine in decaffeinated
coffees 299
- Palmer E T absorption of carotene and vitamin A
239
- Palmer H P use of hematoporphyrine as a therapeu-
tic agent in psychosis 348

- Papavassiliou M J two cases of intoxication by sabina 342
- Paris R preparation of trisodium periodate and periodic acid 112
- Parish H J note on sterilization of oils, 155
- Parke J B emulsions 321
- Parker R R, Rocky Mountain spotted fever results of ten years prophylactic vaccination 272
- Parraud G determination of menthone in oil of peppermint 310
- Parry E J a criticism of shellac B P C 25
- Pastor M T minimum emetic dose of adomidin 183
- Patterson D control of whooping cough with serum and vaccine 273
- Patoir A experimental study of toxicity of sodium bromide in intravenous injection 139
- Patoir G experimental study of toxicity of sodium bromide in intravenous injection 139
- Patterson R, efficacy of typhoid prophylaxis in United States Army 40
- Paulus W microchemical detection of monosaccharides 66
- identification of strophanthin g and k by microchemical test 128
- microchemical detection of conine and nicotine 317
- Pavella T spectroscopic analysis 127
- Pavlas P microanalytical studies of synthetic sweetening agents 17
- dulcin, sweetening agents II microchemical studies of 121
- Payen I detection and determination of apiol in viscera 131
- Payne S clinical and experimental study of acetamide poisoning 191
- Peacock D H a new alkaloid from the bark of *Hofia rhena antidiarterica* 207
- Peakes L V Jr apparatus for microdistillation 307
- Pearson R W determination of copper in organic matter 64
- Peck S M irritants in adhesive plaster 240
- Peck W prescriptions for colds 34
- Pedersen Bjergaard K oestrin and luteohormone 8
- Peeters H food poisoning from *Datura stramonium* 250
- Perier J C study of injectable dyes 142
- Penau H biological study and testing of luteal hormone 243
- Penau M H luteal hormone 59
- Penfold A R physiological forms of eucalyptus as determined by the chemical composition of essential oils and their influence on botanical nomenclature 155
- development of our knowledge concerning eucalyptus oils 160
- Perdue C R value of psormangan in psoriasis and ichthyosis 36
- Pentz G separation of hormones and lipids 114
- Perkins G W preparation of tetrahydronaphthalene peroxide 7
- Peronnet M experimental research on the toxicity of the vapors of benzene 250
- Perrin F metallic derivatives of sodium thioethanesulphonate in therapeutics 247
- Perronito G structure and derivatives of 2 amino benzimidazole 54
- Pesze M new reaction for tartaric acid 316
- Pettet A E J molecular compounds of phenols 7
- Peyer W *Leonurus cardiaca* 132
- bath preparations XIV 296
- bath preparations XV foot baths 297
- certain drug specialties and nostrums in tea form 259
- regarding the progress of homeopathic pharmacy 323
- Pflaff K hydrogen ion concentration of cosmetic products I fatty skin creams 75
- new bases for skin creams 76
- progress in cosmetics in 1934 233
- report on progress in cosmetics of 1934 81
- Pflau A St. relation between odor and constitution in the case of alkoxy-cummarins 162
- Pfeiffer C C comparative study of analgesia produced in normal subjects by morphine codeine heroine and dilaudid 245
- Pfister A anthelmintic action of pumpkin seeds 188
- Phatak N M, effect of intravenous injections of acacia on physico-chemical properties of blood 82
- Philip W B furthering pharmaceutical publicity 82
- profit the way out of the depression 136
- Picon M M preparation and properties of quinine ammonium and calcium aurothiosulphates 6
- contribution to physiologic testing of thioaurates 87
- Piery J determination of quinine in chocolate tablets 16
- Piki J, studies in indole series complete synthesis of physostigmine (eserine) 102
- Pillay P P toddalolactone chemical investigation of *Toddalia aculeata* (Pers.) part 2 109
- Pillokat A use of silver manganite preparations in dermatology 196
- Piotrowski G prevention and treatment of harmful effects of gold therapy 342
- Pistner R volumetric determination of sugar in blood 292
- volumetric determination of residual nitrogen with out distillation 310
- Pitts I P comparative studies on the utilization of different magnesium salts 187
- Plaut P use of prominalettes as sedative 195
- Plum P agranulocytosis due to amidopyrin 30
- Pochon J a new method of titration of antipneumococcal serum by the neutralization of the antibodies *in vitro* 203
- application to antistreptococcal serums of a new method of titration by neutralization of the antibodies *in vitro* 208
- Podesta J C G use of ergotamine tartrate (Gyner gene) ointment in ano vulvar pruritus 348
- Podolskaja M effect of gossypol on color of cotton seed oil 280
- Podolsky E early history of digitals 332
- Poe C solubility of some strychnine benzoates 159
- Pollard C B acyl derivatives of ortho aminophenol 163
- Ponte D preparation of apomorphine hydrochloride for injection 235
- Popesco C determination of alkaloids application of the mercurimetric method to new biological products 216
- Popovici N colorimetric assay of morphine 308
- Posen E fixed color standard for and determination of cholesterol 165
- Potjewijd T review of the monographs of Swiss Pharmacopoeia 74
- review of Swiss Pharmacopoeia 74
- Potts W relation of vapor pressure and boiling point to the composition of glycol water mixtures 3
- Povitzky O R comparison of value of merthiolate and phenol as preservatives for diphteria toxoids 96
- Prasad C potentiometric estimation of copper 120
- Pratt G E treatment of chorea with mirvanol 36
- Prelog V derivatives of N phenyl piperazine 286
- Prescher J contribution to the knowledge and determination of denatured salts 156
- Prubert G use of lorapin in rheumatic diseases 348
- Pritchard H vitamin potency and associated characteristics of average cod liver oil 219
- Pritzger J oil of hawthorn fruit 106
- Proskurnina N harmine and harmaline II nitro and amino derivatives of o alkyl ethers of harmol and harmolol 101
- Pucher G W determination of ammonia and amide nitrogen in plant tissue 216
- Pugh W S newer uses of castor oil 345
- Purdum W A rectal absorption of digitals in cats 185
- Pyman F L some lines of chemotherapeutic research 346
- constitution and action of drugs 347

Q

Qazilbash N A artemisias of Afghanistan producing santonin 313

R

Rabate J sophoricoside new heteroside from fruits of *Sophora japonica* 283

study of *Persica vulgaris* (peach tree) and persicoside 283

Rabbeno A pharmacological action of *Digitalis lanata* and *D. purpurea* 28

pharmacological investigation on *Digitalis lanata* Ehrh 242

Rabinovitch A lysates 349

Rae J colorimetric test for quillaria saponin 16

use of propylene glycol as a solvent 230

Rafsky H A value of histidine monohydrochloride in the treatment of peptic ulcer 349

Ragany J use of silver salvarsan in the treatment of trichinosis 351

Raistrick H molecular constitution of *Penicillium* Charlesu metabolic acids of 56

Rake G a method for titrating the protective action of antimeningococcal serum 152

- viability and virulence of frozen and dried menin
gococcus cultures 154
- Ramaswami C V report on examination of samples
of Indian and foreign coriander (*Conandrum*
sativum) 210
- Ramon G immunizing activity of tetanus toxin in
lanolin 98
- specific treatment of staphylococcal affections 352
- Randall M electrolytic colorimetric method for the
microdetermination of lead 14
- Randon L standardization of vitamins report of
Second International Conference 117
- Rangier M oxidation of sulphur in organic chemistry
application to determination of sulphur 68
- Ranta K phases or types of H pertussis 271
- Rappaport D volumetric determination of calcium in
serum 289
- Rappaport F volumetric determination of calcium in
serum 289
- volumetric determination of residual nitrogen with
out distillation 310
- volumetric determination of sugar in blood 292
- Rapson G N use of rabbits in assay of digitalis
strophanthus and squill 337
- Raucourt M use of anthracene oils for the defence of
crops 273
- Ravaud C J note on the preparation of chloral
suppositories 22
- Ravich A picochrome new urinary antiseptic 93
- a urinary antiseptic 353
- Ray P estimation of zinc in the presence of iron
aluminum uranium beryllium and titanium 310
- Ray P R quinaldic acid as a micro reagent II
estimation of copper and its separation from
cadmium manganese nickel cobalt etc 126
- quinaldic acid as a micro reagent I estimation
of zinc and its separation from manganese 127
- Read F L determination of metallic iron in presence
of iron oxides reduced iron 167
- Redgrove H S raspberry and strawberry flavors 231
- stone fruit flavors 280
- Regnier J study of the activity of different cocaine
salts 239
- Regnier M T antidotes of hydrocyanic acid and more
particularly the mechanism of the antidote action
of glutathione 342
- Regrub B noteworthy new special aromatics 278
- Reichert B detection of potassium ion with gardinol
W 126
- constituents of *Verbena officinalis* L 284
- Reif E C pharmacology of galinsoga 86
- Reimers E titration of alkaloidal salts use of pormer
blue as indicator 117
- Reimers F solubility of morphine in different solvents
102
- albumin tannate 294
- determination of diaminoacridine in euflavine 302
- Reinartz F degradation of camphors and diketone
camphanes in animals 84
- Reiners F quantitative determination of theophylline
in soluble preparations 18
- Reinhold J G quantitative determination of free
cholesterol and as ester without the use of digitonin
63
- Reissner R quantitative microdetermination of cop-
per 166
- Reko V A *nánacatl* *Delenum Fungus* (*Amanita*
Mexicana) 108
- a chapter on Mexican skin poisons 191
- Remington R E iodine content of cod liver oil 50
- Renfrew A G value of cinchona alkaloids in pneu-
monia miscellaneous alkaloids and some hydro-
cuprene ethers 85
- cinchona alkaloids ketone formation with sodium
amide 99
- Rememund K natural and synthetic lumi lactoflavin
59
- Rennie A Easton's syrup 79
- Reti L alkaloids of *Cereus coryne* 157
- Reuter F molecular constitution of *Penicillium*
Charlessi metabolic acids of 56
- Reverey G phosphate preparations 53
- Reynolds D experimental studies in alcoholism IV
attempts to modify the concentration of alcohol
in the blood after intravenous administration of
alcohol 240
- Reynolds S R M inhibition of uterine motility with
crystalline progesterin *in vivo* 339
- Reynolds T M strychnine and brucine part
XXXIII 277
- Rhodes P comparative study of enteric coatings 347
- Rice R V adsorption of strychnine sulphate by vari-
ous charcoals and by Lloyd's reagent 49
- Richardson R W non staining iodine ointment 228
- Richmond G M stimulation of the adrenal medulla
by irradiated insulin 139
- Riddle O lactogenic factor of pituitary 60
- Rider T H the air lift extractor applied to the
analysis of alkaloidal drug extracts 117
- stability of diethane solution II 120
- volumetric determinations of halides use of dichloro-
fluorescein as an adsorption indicator 220
- Rigg J G component glycerides of piqui A fats 161
- Riley C H separation and detection of cocaine in
mixtures of cocaine and procaine 301
- Rimbaud triple poisoning by arsenic 172
- Rimington C chemical problems connected with the
study of toxic plants investigation and isolation
of the active principles 285
- Rintelen P bitter principles of calumba root 210
- Ripert J new method of analysis of pyrethrum prod-
ucts 68
- relative toxicity of pyrethrin I and pyrethrin II 189
- Rising L W place of a field representative in co-
operative professional advertising 81
- Ritsema I C identification reactions for acacia 12
- Rizzotti G new colorimetric method for determining
morphine and its derivatives 15
- Roark R C insecticides and fungicides 154
- Robbins B H content of proteolytic enzyme in
latex from the fig tree (*Ficus Carica* L.) 107
- proteolytic enzyme in the latex from the fig tree
(*Ficus Glabrata*) 107
- Roberts A C new method of preparation of throm-
bin 60
- Roberts W L hydroxyl number and acetyl value of
fats and oils 304
- Robertson A picrotoxin part I 287
- Robertson I M modified chromic acid method for
determination of carbon 10
- Robertson W E value of sodium formaldehyde
sulfoxylate in mercury poisoning 342
- Robey L phases or types of H Pertussis 271
- Robinson R experiments on the synthesis of physo-
stigmene (escerine) part XI 276
- anti malarial drugs of natural origin 343
- strychnine and brucine part XXXIII 277
- Robinson R A benzofuroquinolines 109
- Rodden C J electric micromuffle 303
- Rodgers C R action of thallium in experimental
animals 87
- Römer H use of prontosil in streptococcal infections
195
- Rönnark B various methods for determination of
vitamin A 190
- determination of vitamin D 190
- Rönnark B titrimetric assay of vitamin C 19
- Rohmann C molecular solubility of aluminum sub-
acetate 274
- Rojahn C A new remedies 147
- directions for the preparation of pharmaceutical
and phytochemical products 286
- Roland G history of the discovery of vitamins 164
- Rolfe H G determination of metallic iron in presence
of iron oxides reduced iron 167
- Rose C L detoxification of amidopyrine by sodium
amylal 192
- action and toxicity of retorsine 246
- cyanide poisoning and its treatment 341
- Roseboom T quality of drugs 120
- Rosenblum E I extract of malt 122
- hydrogen peroxide 150
- Rosenbush R phosphate preparations 53
- Rosenfeld S new method of determining plasma
fibrin 60
- Rosenheim M L value of mandelic acid in urinary
infections 194
- Rosenthal S M use of sodium formaldehyde sulphony-
late in mercury poisoning 192
- Rosenthaler rôle of microchemistry in pharmacopœias
25
- microsublimation as a pharmacopœial test 222
- Rosenthaler L Jamaica and Madagascar kola 70
- contribution to variation statistics of drugs 316
- crystal precipitation by salting out 302
- investigation on galenical preparations III Fowler's
solution 134
- remarks on the new Swiss Pharmacopœia 325
- Rosin J activated charcoal 299
- Ross H J use of azochloramid in root canal antiseptics
345
- Ross J R poisoning of children by strychnine 90
- Ross V oral immunization of human beings against
pneumococcus 2
- Rotermel A production of camphor from *Ocimum*
canum 160

- Rothenheim C A calcium gluconate for injection 235
pill masses 237
- Rothermundt M assay of several arsenobenzenes derivatives 105
- Rotondaro T A estimation of alkaloidal salts by direct titration of their acid radicles 215
- Rowan P A determination of rotenone content of dennis root 120
oil of citronella 279
- Rowe A H Inhalation of adrenaline for the relief of asthma 343
- Rozeblum J reaction for morphine in papaverine hydrochloride 160
reaction for distinguishing between chloroform and carbon tetrachloride 218
- Ruberg L A local anesthetic action of dialkyl aminoethoxyethyl β aminobenzoates 337
- Rubow M W derivatives of 8 aminoquinoline as antimalarials IV 252
- Rudy H dimethyl flavin 67 dimethyl flavin 9
acetic acid 58
natural and synthetic lumi lactoflavin 59
optical activity of lactoflavins 65
synthesis of vitamin B₁ phosphoric acid 61
- Ruehle A E studies of crystalline vitamin B₁ II
elementary composition and ultraviolet absorption 61
studies of crystalline vitamin B₁ VIII sulphate cleavage II chemistry of the acidic product 164
- Ruemele T borax and sulphur in cosmetic preparations 74
- Rusby H H Russian ergot 173
- Rustung E research on the content of heavy water in mineral waters 274
- Rutenbeck H orthosiccol clinical investigations of a new preparation from Koemis koetjeng the Indian kidney tea 195
- Ruzicka L testicular hormones clarification of constitution of androsterone 116
- Ruzicka W rapid method for the determination of iodine number 167
- Rymill F E determination of mercury content of mercurochrome 306
effect of hot solvents on ergot note on effect of storage on activity of ergot 322
- S
- Saad K effect on drugs on the isolated splenic capsule of man and other animals 189
- Sabetay H color reaction of azulenogenic sesquiterpenes 296
- Sabetay S advances in the field of aromatics and volatile oils in 1933 ketones 102
color reaction of azulenogenic sesquiterpenes 296
determination of ethyl phthalate in essential oils by potassium phthalate method 122
- Sachs A methods for determining blood iron comparison of wet and dry ashing 57
- Sachs W accidental overdose of phenolphthalein in a child without ill effects 32
- Sagastume L C malaria treatment with quechuo Dominguez 350
- Salle A J comparison of resistance of bacteria and embryonic tissue to germicidal substances I merthilate 46
comparison of the resistance of bacteria and embryonic tissue to germicidal substances II metapen 96
germicidal substances IV hexylresorcinol comparison of resistance of bacteria and embryonic tissue 163
germicidal substances III mercurochrome comparison of the resistance of bacteria and embryonic tissue 153
- Salmon U J an improved method for determination of the gonadotropic hormone 187
- Samaan K contribution to the pharmacology of syntropin 247
- Sanborn N H availability of calcium in foods containing oxalates 289
- Sanchez J A new color reaction of quinine quindine and cupreine and its application to the determination of quinine 17
application of the indophenine reaction for the identification of some organic polyacids 305
colorimetric microdetermination of morphine in opium its preparations and in morphine syrup 66
colorimetric microdeterminations of morphine in opium and its preparations tincture of laudanum and syrup of morphine hydrochloride 168
use of indophenine reaction for the identification of some organic polyacids 65
- Sandholzer L A bacteriostatic action of indole on Gram negative enteric bacilli and on certain cocci 271
bacteriostatic action of skatole on Gram negative enteric bacilli 272
- Sandovici M study of the alteration of medicinal products by pH determinations 168
- Sargus M N electrolytic-colorimetric method for the microdetermination of lead 14
- Satino S fertilization of *Datura stramonium* and *D. metel* in the incompatible cross 204
- Satranio T antiseptic power of certain solutions of iodine 228
- Sauer L W immunization against whooping cough 47
- Saulerlin II bismuth poisoning pharmacodynamics and toxicology of bismuth 341
- Sauvatre P concentration of alcohol when stored in wooden vessels 226
- Savare J purgative action of castor oil and alimentary disequilibrium 239
- Saxholm K standardization of medicinal agents 111 particle size and degree of dispersion of important medicinal agents 125
- Schade W isolation of 1,2 dimethyl naphthalene from coal tar 55
- Schafer G homeopathic tinctures of atropine group 71
homeopathic preparations VI evaluation of saponin containing tinctures 123
- Schenk bone acid containing fat reducers 88
- Schenke bakelite containers 235
- Schenker bakelite containers 180
apparatus small scale suppository mold for pharmaceutical machinery 232
- Schening K simple and rapid procedure for Nylander test 67
- Schening Kahlbaum A G follicle hormone derivatives 290
- Schiavo A J female sex hormones 116
- Schindler H action of aqueous extracts of drug plants on *Bacterium coli* and *Aspergillus niger* 270
- Schmelkes bacterial action of azochloramid 45
- Schmelzer Wo Baljet color reaction of compounds of digitalis 167
- Schmidt G toxic constituents of *Tephrosia vogelii* seed 21
- Schmidt H amine salts of antimonic and benzenesulfonic acid 54
complex pentavalent antimony compounds with aromatic polyhydroxy compounds, 55
potassium stannic pyrocatecholdisulphonate and other complex metal compounds 56
- Schmidt W laws and orders regarding pharmacy in 1934 238
- Schmitt F acute somnifer poisoning 32
- Schneider D L effect of temperature of storage on bacteria in water samples 152
- Schneider H microscopic identification of platinum metals 311
- Scholz C R constitution of corynanthine 206
- Schoorl N differentiation between chloroform and carbon tetrachloride 300
color reactions of pyrimidin 312
- Schou S A alkaloid content of cinchona bark and cinchona decoctions 11
physiological and physico-chemical considerations in the preparation of medicines for injection 332
reactions of solutions of cocaine on sterilization and storage 48
- Schitscherbatschew, D cultivation of medicinal rhubarb 70
- Schulck E determination of hexamethylenetetramine and its decomposition in dilute aqueous solutions 220
- Schulemann W anti malarial drugs of natural origin 343
- Schulte M J determination of hexamethylenetetramine in its anhydromethylene citrate 123
- Schultze E W nature of formalin inactivation of bacteriophage 152
- Schulze K review of German specialties for 1934 44
methods of preparation and assays of new homeopathic dispensatory 178
specialties and products of research in 1934 196
- Schumacher A clinical investigation of lubrolal 194
- Schwab R folinerin 193
- Schwartz L irritants in adhesive plaster 240
- Schwartz S O peptic ulcers produced by feeding cinchophen to mammals other than the dog 140
- Schwarz K microshaker useful in microtitrations 308
- Schweizinger E medicinal cod liver oil obtained by steam methods vitamin content 280

- Scott L C observations on antigens for complement fixation in amebiasis 140
- Secareanu S purification of insulin method for precipitation of insulin 116
- Secareanu S new method for precipitation of insulin 104
- Secareanu St rapid method for the determination of purity of commercial insulin *in vitro* 221
- Seevers M H cardiac irregularities produced by ephedrine after digitalis 86
- comparative study of analgesia produced in normal subjects by morphine, codeine heroine and dilaudid 245
- Serf L D the air lift extractor applied to the analysis of alkaloidal drug extracts 117
- Seifert R applicability of the color and luminescence comparator of Rojahn Heinrich for colorimetric analysis and pH determinations 301
- Seller J the growth promoting and growth arresting action of pigments on plants 150
- Semb J relation of π and surface tension to activity of local anesthetics 243
- chemistry of heptane and its solutions No 6 solubility of the halogens in heptane 280
- phytochemical notes No 108 a phytochemical study of the seed of the digger pine 281
- Servinghaus E L relief of menopause symptoms by estrogenic preparations 35
- Seshadri T R alkaloids of senecio 208
- Sesher W P tensile strength and density of paraffin wax at various temperatures 222
- Shackell L F testing of local anesthetics by sciatic nerve block in guinea pig 83
- Shapiro A fixed color standard for and determination of cholesterol 165
- Shapiro H nomogram for centrifugal force 3
- Sharlit H clinical implications from the testing of fungicides 45
- Sheets O determination of copper in organic matter 04
- Sheppe W M therapeutic use of methylene blue in phenol poisoning 89
- Sherman H C determination of vitamin A values by method of single feedings 30
- Shewan J M modified chromic acid method for determination of carbon 10
- Shillito F H effect of nembutal upon serum cholesterol of dogs 188
- Shipway G tribromethanol anesthesia 343
- Shipway G L vinethene 30
- Shriner R L local anesthetic action of dialkyl aminoethoxyethyl β aminobenzoates 337
- Shunk I comparative studies of presumptive test media for coli aerogenes group 45
- Shupe I S detection and determination of 2,4 dinitrophenol 302
- Sido M detection of oxidase in mucilage of acacia 13
- Siebert C tannin esters 288
- Signy A G treatment of vulvo vaginitis with oestrin 91
- Silman H eau de cologne 75
- violet perfumes 134
- Silsby J N note on open prescription departments 82
- Simon F A hypersensitiveness to pituitary extract, 245
- Simon I Sardinian digitalis 21
- Simon J F effect of morphine on human ureter 188
- Simonds J P peptic ulcers produced by feeding cinchophen to mammals other than the dog 140
- Simonet H biological study and testing of luteal hormone 243
- Simonsen J L recent progress in the chemistry of terpenes 280
- Singer A identification of lard in pharmaceutical preparations 124
- Singer E chemotherapeutic testing of arsanilic acid N (p dimethylaminobenzoal) 90
- Sissons A T S notes on some analytical methods with special reference to their teaching value 118
- Sivori P N action of crotylamine hydrochloride on the isolated small intestine 240
- Skarmitzel E scheme for microscopic examination of drugs 70
- Skirball J J ocular reactions due to arsphenamine 249
- Skyrme E W botanical sources of drugs derived from the genus *Plantago* 173
- structure and histology of ispaghula seeds of *Plantago ovata* Forsk 225
- Slight D codeine addiction 31
- Small L reduction studies in morphine series VI hydrogenation of alpha and beta isomorphs 3
- Smith A H relation of calcium to blood formation 140
- Smith D M, aldehydes and ketones improved hydroxylamine method for determination of displacement of oxime equilibria by means of pyridine 8
- Smith E effect of amylal and amidopyrine on blood picture of the albino rat after a deficient diet 336
- Smith F A U standards for digitalis U S P 138
- Smith F R bactericidal action of chlorine 96
- Smith H new crystalline principles from Indian *Artemisia* 20
- Smith H R, permanent aqueous microscopic mounts 318
- Smith M C fluorine toxicosis 191
- Smith P C general physiology of anterior pituitary 57
- hypophyseal gonadotropic hormones 58
- Smith P K ratio of toxicity of acetanilid to its antipyretic activity in rats 240
- Smith S strophanthin of *Strophanthus emini* 161
- Smith T new crystalline principles from Indian *artemisia* 20
- Smith W characters of halibut liver oils 281
- assay of glyceryl trinitrate tablets 304
- Sneath P A T persistence of tetanus antitoxin in man 273
- Snider H J destruction of organic matter in plant material by the use of nitric and perchloric acids 222
- Solomon W apoquinine and apoquinidine 206
- modified cinchona alkaloids Part II 275
- Sommer H Rauchschnee 172
- leaves 205
- Sommer W clinical experience with novophyllin 195
- Sonntag F oil of hypericum 310
- Soskin S total ascorbic acid content of human blood method of determination 113
- Soutter C chlorine content of humors after death 224
- Spaulding L B synthesis of 5,5 alkyl phenylbarbituric acids 6
- Spease E some observations after twenty five years experience in teaching pharmaceutical mathematics 80
- Spengler R use of forapin in rheumatic diseases 348
- Spicer C L hemolytic streptococci in erysipelas 153
- Spicer S hemolytic streptococci in erysipelas 153
- Spies J R croton resin III combined acids 4
- croton resin II toxic and vesicant action of certain of its derivatives 28
- croton resin I toxicity studies using goldfish 28
- Spoon I W storage of derris 225
- Spriet H poisoning by arsine 249
- Stacey R S treatment of low calcium tetany with caleferol 345
- Stadler R bath preparations XV foot baths 297
- Stammer C some remarks on Belgian Pharmacopoeia IV 24
- Stamovsky L standard for sunburn preventives and a method of testing 30
- comments on solar shields 179
- epithelial anesthesia 337
- Stanek V microanalytical studies of synthetic sweetening agents 17
- dulcin sweetening agents II microchemical studies of 121
- Stanton B L rationale of new uses for some old drugs 140
- liver and drug therapy in pernicious anemia 195
- Staub H effect of dinitrophenol on heart 185
- Stearns G retention of calcium by infants fed evaporated milk containing cod liver oil concentrate 346
- Steel J P cod liver oil treatment of wounds 346
- Steele B antigenic characteristics in man of certain products of the pneumococcus 97
- Steenhauer A J application of micro-copper pyridine reaction to some organic acids 222
- Steger A seed oil of *Coula edulis* 280
- Steger K contribution to the knowledge of the extraction of ipecac 72
- Steiner H micro heat conductivity apparatus for gas analysis 122
- Stenger V A value of calcium hypochlorite as volumetric oxidizing agent stability and standardization of solution of calcium hypochlorite determination of ammonia 62
- Stensig S partition of phenol between olive oil and serum in acetic fluid 164
- Stern C S simultaneous immunization against small pox and diphtheria 272
- Stern E L influence of bile salts on the nervous system following intraspinal usage 136
- Sternback M effect of amidopyrine on leucocyte count 183
- Stevens I M recent studies on psittacosis 154
- Stevens M F staphylococcus toxins and antitoxins 155

- Stevens T S synthetic experiments on protopine and allied alkaloids part II 270
- Stewart T M dynamic action of drugs 140
- Stuckley C S occurrence of arsenphenamine poisoning among negro women 341
- Stirling A C natural musks 71
- Stock V F poisonings common in general practice 140
- Stoll A glucosides of *Digitalis purpurea* 51
 β iodohydroxy-naphthalenedisulphonic acids 50
Digitalis purpurea and *lanata* 283
 ergobasine new water soluble alkaloid of ergot 200
 stable solutions of calcium gluconate 55
- Stone R studies of correlated human and bovine brucellosis, 163
- Stoughton feminine hygiene jellies 76
- Strafford N determination of small amounts of sulphur in certain organic compounds 68
- Strangeways W I trypanocidal action of arsenicals K 324 and K 352 in mice and rabbits 330
- Straub H toxicity of nitro compounds 89
- Strauss K investigation with cod liver oil ointment Unguentolan 193
- Strauss M B effect of autolysis on potency of liver in treatment of pernicious anemia 115
- Strecker E A use of hematoporphyrin as a therapeutic agent in psychosis 348
- Streitwolf K organic arsenic compounds 50
- Striatar J special variety of staphylococcus concerned in food poisoning 97
- Stroock L W distribution of selenium in nature 157
- Stroud W T value of verodigin in cardiovascular disease 36
- Strumza V food value and anti anemic power of oysters 139
- Strzyzowski C a new stabilized antidote for heavy metal poisoning 340
- Stuart E H method for obtaining vitamin B₁ 117
- Stuhr E T drugs and bugs 132
 potency of Oregon digitalis 184
 some pharmacological and bactericidal properties of umbellulone 104
- St von Mallinckrodt Haupt A content of vitamin D in saline bases containing cholesterol I absorption through the intestinal mucosa 190
- Subrahmanyan V simple method for the determination of nitrogen 126
- Suchy J F adsorption of strychnine sulphate by various charcoals and by Lloyd's reagent 49
 solubility of some strychnine benzoates 159
- Sulzberger M B influence of ascorbic acid on sensitization of guinea pigs to neoarsphenamine 84
- Sunderland E the highly unsaturated acid of the kernels of *Parinarium laurinum* 281
 the highly unsaturated acid of the kernels of *Parinarium macrophyllum* 281
- Susplugas J histologic study of *Grindelia robusta* Nutt. 70
- Sutcliffe W D antigenic characteristics in man of certain products of the pneumococcus 97
- Swadesh S total ascorbic acid content of human blood method of determination 113
- Swanson E E sodium propyl methyl-carbinyl allyl barbiturate a short acting hypnotic 246
- Sylvester N D determination of copper in foods with special reference to milk 219
- Szahender K content of umbelliferone in Persian gum ammoniac 129
- Szalkowski R activated charcoal 299
- Szegho F estimation of morphine in opium 169
- Szymtowna M fusion curves of binary systems bromural and veronal with salol and phenacetin 98
- T
- Tabern D L crystalline forms of ephedrine alkaloid 99
- Taboury M F volumetric determination of arsenates 216
- Tainter M L metabolic activity of compounds related to dimphenol 28
 action of dimphenol on rate of oxidation of ethyl alcohol *in vitro* 242
- Tanaka T *in vivo* action of diiodotyrosin I diuretic action 85
- Tanner F W effect of temperature of storage on bacteria in water samples 152
- Tattersfeld F deterioration of pyrethrum 230
- Tauber H sensitive spot reaction for ascorbic acid (vitamin C) 118
- Taylor G G vapor pressure and dehydration of unstable salt hydrates sodium perborate 205
- Taylor H F halibut liver oil 5
- Taylor T I vapor pressure and dehydration of unstable salt hydrates sodium perborate 205
- Terle F immunity relative importance of reticulo endothelial tissues and circulating antibody 46
- Teatler A R observations on dogs under continued influence of ephedrine 242
- Ten Han Tang chemical composition of *p'an shua* 158
- Teng Han Tang studies on *wei ling sein* 159
 composition of purple flowered *mao tsao* 162
- Terpugoff J oxidation of spirit of turpentine 209
- Thayer S A crystalline ovarian follicular hormone 114
- Thiel A irreversible fading of phenolphthalein 223
- Thienes C H experimental rabies in white mice and attempted chemotherapy 87
- Thomas G N determination of alkaloids in injectable solutions 294
- Thomann hints for use of disinfecting agent 2
- Thomann J preparation of sterile distilled water in a vacuum 174
 reserchies with oxybenzoic acid esters for sterilization of eye drops 271
 note on an article on sterilization in the Swiss Pharmacopoeia V 323
 use of zephrol Bayer in pharmaceutical practice 324
- Thomas J O activity of bone phosphatase in chronic fluorine poisoning 241
- Thompson M R active constituents and a pharmacological and chemical study of ergot 29
 active constituents of ergot pharmacological and chemical study 90
 active principles of ergot 276
- Thompson R L attempts to produce immunity with large quantities of killed herpes virus 97
- Thompson W O *et al* pharmacology of thyroid in man 247
- Thoms B therapy of respiratory diseases by quinine 106
- Thorbjarnarson T occurrence of unsaturated hydrocarbon in olive oil 5
- Thorn S T oil of rose mallow seed 107
- Thurmon F M ocular reactions due to arsphenamine 249
- Tice I F hand type homogenizer and its use in making emulsions 132
- Tittler R P bacteriostatic action of indole on Gram negative enteric bacilli and on certain cocci 271
 bacteriostatic action of skatole on Gram negative enteric bacilli 272
- Todd R W effectiveness of typhoid fever vaccine in control of typhoid fever 273
- Todhunter E N determination of vitamin A values by method of single feedings 30
- Toennies G preparation of tetrahydronaphthalene peroxide 7
- Tomaso G alkaloids of peyote 276
- Tomb J W simple formula for acriflavine emulsion 179
- Tomingas A primula root 53
 value of fresh lupulin 108
- Toni G method of extracting active principles of *Adonis vernalis* 282
- Toomey J A phases or types of H Pertussis 271
- Tordera A use of ergotamine tartrate (gynergene) ointment in ano vulvar pruritus 348
- Tosatto A standardization of insulin preparations 29
- Tournaire A skin reaction of diphtheria toxin 270
- Tramasau M pharmaceutical kaolin 157
- Traut E F use of strychnine and quinine in treatment of premature contractions 196
- Travassos J staphylococcus toxin 272
- Trease G E British and American pharmacognosy syllabus compared 226
- Trimble H M relation of vapor pressure and boiling point to the composition of glycol water mixtures 3
- Trop J sources of ephedrine 158
- Tropp G V fluidextract of ergot 322
- Truttwin H pharmacological and toxicological view points in cosmetology 188
- Tschenkoekya T adsorptive properties of substances used in the preparation of pills 230
- Tschesche R constituents of *Strophanthus hispidus* 107
- Tschurch A culture of Chinese rhubarb 205
- Tsei Ying Tseng chemical composition of *p'an shua* 158
- Tseng K F constituents of *Daphne genkwa* 284
- Tuck V L value of sodium formaldehyde sulfoxylate in mercury poisoning 342
- Tufts E V colloidal calcium phosphate of blood serum and calcium partition in serum 57

- Turbet toxicologic study of potassium ferrocyanide as a clarifier for white wines 171
 Turner A W study of the morphology and life cycles of pleuro pneumonia contagiosa Boum 272
 Turner H A presence of manganese in commercial lime and bleaching powder 168
 Turner K B effect of nembutal upon serum cholesterol of dogs 188
 Turner R G blood alcohol its relation to intoxication in man 241
 Turner T W natural distribution of *Cytisus scoparius* in Virginia with special reference to soil reaction 204

U

- Uhl A H non heptane constituents of digger pine (*Pinus subnana*) 162
 Underhill S W F use of rabbits in assay of digitalis strophanthus and squill 337
 Underwood C C toxic reactions of bromides 250
 Underwood E A value of alum precipitated diphtheria toxoid 96
 Unna P laxatives 42
 Uter W use of providoforn in skin disinfection 350

V

- Vaile C detection of provoked galactose in urine according to technique of Fiesinger and application of method of Fleury and Marquet 12
 Vaile Ch reactions for the differentiation of argyrol collargol electrargol and protargol 206
 Vaisman A curative and preventive action of 4' sulfamido 2,4 diamino azobenzene hydrochloride in experimental streptococcus infection 204
 Valaer P red pill (or opium substitute) 223
 Valentin chromatographic adsorption analysis in pharmacy 300
 Vallee C intoxication by trichlorethylene 131
 Vance J E modified iodimetric method for determining copper 119
 Van Dyke H B relationship of potency of digitalis as determined by different methods 242
 cumulative poisoning by lanadigin digitoxin and ouabain 243
 Van Gaske A H P yohimbine 278
 Van Gastel A J P composition of commercial yohimbine 316
 Van Giffen H J passiflorine 76
 analysis of acimo 62
 analysis of tonicum N M P 128
 Van Haltern G W use of Chaparro amargoso in treatment of amebic dysentery 345
 Van Hauwaert M determination of proteolytic activity of pepsin 15
 British Pharmaceutical Codex 1934 178
 determination of biologic value of lactic ferments 65
 Van Huffel A J pharmacy at the beginning of the 19th century 238
 apothecaries of the Hague 237
 Van Itallie E I survey of recent researches on pectins 5
 use of lecithins in nutrition etc 115
 Van Loon J seed oil of *Coula edulis* 280
 Van Nieuwenburg C J cerimetric titration of small amounts of iron by means of $\alpha\alpha'$ dipyrindyl as indicator 305
 Van Schoor O pharmaceutical formularies and the Belgian National Formulary 233
 Van Stolk D luteal hormone 59
 Van t Spijker J N determination of arsenic in tonicum 128
 Van de Velde A J J quantitative determination of biologic value of medicinal yeasts 30
 Van Der Wielen P inaccuracy of glass graduates 12
 Van Der Wielen reactions of borax glycerin water solutions 298
 Van Zijp C use of ammonium molybdate as a microchemical reagent 164
 Vargas V kola nut cultivated in Brazil 207
 Varma P S oil of *Sarcostigma lemnii* 281
 Vartiainen A action of ergoclavine and sensibamine 243
 Vasquez S detection of organic compounds by spot reactions IX (1) detection of acetic acid by formation of indigo (2) detection of methyl ketones by conversion to indigo dyes 170
 Vastagh G quantitative determination of sodium chocolate preparations 127
 Vaughan S L Van Der Bergh reaction of bilirubin variations in xanthochromic cerebrospinal fluid 80
 Veit F distribution of alkaloids in different parts of

- central nervous system and their quantitative microdetermination in tissues I scopolamine and atropine 241
 Venance new method for picking microscopic objects out of water 125
 Venerol Westnik use of gonococcus vaccine in acute gonorrhea 348
 Venkatraman K V antigens of cholera group of vibrios 260
 Verley A synthesis of Tiemann's iron 288
 Verschuere G arsenical Fowler solution 235
 Vershinin N V use of thermopsis as an expectorant 352
 Veselovsky O action of ergoclavine on diuretics 243
 Vickery H B determination of ammonia and amide nitrogen in plant tissue 216
 Viehoever A evaluation of aloe 20
 Vignoli L pharmacologic tests of apio 83
 Vincke L study of commercial drugs containing atropine 206
 Vintilescu J biochemical synthesis of β cyclopentyl and β cyclohexyl glucosides 110
 Viswanath B report on examination of samples of Indian and foreign conander (*Conandrum sativum*) 210
 Vladimirov G F electrometric determination of bromine in the presence of large amounts of chlorine 298
 Vogt M distribution of alkaloids in different parts of central nervous system and their quantitative microdetermination in tissues I scopolamine and atropine 241
 distribution of alkaloids in different parts of central nervous system and their quantitative microdetermination in tissues II quinine and mescaline 241
 distribution of drugs in different parts of central nervous system and their microdetermination in tissues VI chloral hydrate 242
 Vogtmöller P relation of vitamin B in foodstuffs 117
 Volland O constituent of *Microsechum helleri* Tard (*Pseudosechum Rand*) 283
 Vollmer H tannin content of labiate 21
 leonurus cardiaca 132
 Voyatzakis L use of potassium stannous chloride in the volumetric determination of copper 120

W

- Wagenaar M contribution to the microchemistry of antipyrine 216
 coloring of pyrimidin by certain oxidants 171
 determination of hydrochloric acid in stomach contents 290
 localization of the alkaloids in *ipeacac* root 158
 microchemical reactions for pyrimidin 223
 urinalysis among the ancients 26
 Wagner E microchemical detection of magnesium and aluminum with alkannin and naphthazarin 168
 Wagner R presence of lignin in leaves 52
 Wagstaff A I crystalline structure of sugars Part I 284
 Wald J cellulose varnish 233
 Waldstätter E evaluation of althea leaves and root 226
 Walker J biogenesis of some terpenes 4
 Waller R G control of whooping cough with serum and vaccine 273
 Wallfield M J toxic reaction to alpha dimethyloresol 340
 Walsh G occurrence of arsphenamine poisoning among negro women 341
 Walter A W application of the Neufeld reaction to the identification of types of pneumococci 97
 Walther W W effect of large doses of potassium chloride on *Masthemia Gravis* 350
 Walton B cleansing cream containing magnesium hydroxide 233
 Walton R P absorption of drugs through the oral mucosa II 242
 absorption of drugs through the oral mucosa 186
 absorption of drugs through the oral mucosa III fat water solubility coefficient of alkaloids 242
 comparison of motor effects of morphine codeine and dihydridol on Thierry fistula 188
 Wan C S iodine value of tung oil 129
 Wang C preliminary report on study of amseed oil from Kuangs 208
 Wang Y extraction of male sex hormone from urine
 Ward C B antelmintic studies on alkylhydroxybenzenes I alkylpolyhydroxybenzenes 27
 Ward G E production of fat from glucose by molds

- cultivation of *Penicillium javanicum* van Beijma in large scale laboratory apparatus 50
- Ward J C effect of altitude on the action of drugs I strychnine 186
- the detection of thallium alkaloidal reagents VII 172
- Wartenberg G history of the Apothecary of the Golden Eagle in Lundburg on the Warthier 332
- Waterman R L studies of crystalline vitamin B₁ cleavage of vitamin with sulphite 61
- studies on crystalline vitamin B IV injection method of assay 248
- Watson C E use of bismuth violet in malaria and for chancreids 34
- Watson E M scheme for the identification of the simple liquid preparations of the British Pharmacopoeia 125
- Watt H E alkaloids of senecio 208
- Waud R A pharmacological action of alkaloids of fumaraceous plants II corydine 336
- Wauing L C study of oil of Chinese insect drug Chiu Hsiang chung 50
- Weber E refracto densimetric determination of spirit of camphor 314
- Weese K value of urea as a diuretic 196
- Wegmann T sulphur in insulin 291
- Wehrlein H L use of bacteriophage in the treatment of urinary infections 269
- Weil G P acid indices of the officinal oils and waxes lime liniment of the Belgian Pharmacopoeia IV 214
- Weil O quinine salt of 2 phenylquinoline-4-carboxylic acid 207
- Weil R quinine salt of 2 phenylquinoline 4 carboxylic acid 207
- Weiner D O effects of sodium amy tal on erythrocyte count following hemorrhage 87
- Weissman A I investigation of the new biologic test for hormones in pregnancy urine 290
- Weiss L evaluation of ferrum reductum by the sublimate method 12
- Weitz R vermifuge grains of the Combretaceae of Madagascar 274
- Wen S H iodine value of tung oil 129
- Wendel W B methylene blue methemoglobin and cyanide poisoning 250
- Wenger P microdetermination of zinc by means of anthranic acid 317
- Wenusch A presence of nicotine in tobacco 102
- Werner H W volatile oil of *Hyptis mutabilis* 101
- West N W incompatibility of magnesium oxide with sodium bicarbonate 180
- West R pharmacology and therapeutics of curare and its constituents 240
- Wetherby M latent tuberculosis antibodies 98
- Weygand F lacto flavin in *N*/20 6-7-dimethyl 9-L-araboflavine 57
- Whitman C L professional relations between dentist and pharmacists 182
- Whitmore W F microscopic identification of platinum metals 311
- Wibaut H P yohimbine 278
- Wibaut J P composition of commercial yohimbine 316
- yohimbine 208
- Wiener A S new method of determining plasma fibrin 60
- Wiesmann F microsublimation is it useful in the investigation of powdered drug mixtures? 308
- Wikander T state of professional pharmacy and chemical pharmaceutical industry in the Soviet Union impression from a tour 335
- Wild S investigation of the protective effect of various preparations against ultraviolet light 340
- Wiley M H sugar comparison of reducing sugar methods 17
- Willard H H standardization of potassium dichromate 15
- Williams micro-detection of heroin 305
- Williams C H determination of hydrocyanic acid in plants 123
- Williams C H M harmful effects of sodium perborate preparations 343
- Williams J M heating of fats and waxes 23
- preparation of cosmetic creams 25
- vanishing creams 78
- Williams J W effect of dyes on colonies of certain pathogenic fungi 46
- scalp products and hair of men and women as culture media for certain pathogenic fungi 46
- tooth paste 331
- Williams L S the successful application of U S P and N F publicity in a retail pharmacy 182
- Williams R studies of crystalline vitamin B₁ II elementary composition and ultraviolet absorption 61
- Williams R R studies of crystalline vitamin B₁ cleavage of vitamin with sulphite 61
- studies of crystalline vitamin B₁ VIII sulphite cleavage II, chemistry of the acidic product 164
- Williams V V composition of ethereal oil of *Abies sibirica* 278
- Willson, J R effect of coffee and decaffeinated coffee upon tremor in normal men and women 239
- Willson V A determination of available chlorine in hypochlorite solutions by direct titration with sodium thiosulphate 13
- Wilson J B determination of methyl alcohol in alcoholic products 307
- Wilson R H activity of bone phosphatase in chronic fluorine poisoning 241
- Wintersteiner O studies of crystalline vitamin B₁ II elementary composition and ultraviolet absorption 61
- Wirth E H the teaching of habitats in pharmacognosy 181
- Wirtz H testicular hormones clarification of constitution of androsterone 116
- Wokes F acetonitrile test for thyroid 189
- Wolpe M production of medicinal hexamethylene tetramine from technical product 112
- Wolstadt R titrimetric determination of camphor in drug preparations 218
- Woodley J D effect of caffeine and theobromine upon digitalis toxicity 191
- Woodman R M studies in emulsions III lipin containing substances as emulsifiers 47
- Worsley R R cinchona in Amam 225
- Wright C I respiratory effects of morphine codeine and related substances III effect of morphine dihydromorphine dihydromorphine (dilaudid) and dihydromorphine (dicodid) on respiratory activity of rabbit 30
- Wright T G assay of citrine ointment 63
- Wrubel M laboratory method for the study and control of 303
- Wu H extraction of male sex hormone from urine 7
- Wulff L M R some effects of alpha-dinitrophenol on pregnancy in white rat 83
- X
- Xavier M F photochemical notes No 113 an unusual peppermint oil 279
- Y
- Yabuta T alkaloids of senecio 208
- Yakowitz M L note on standard solutions of potassium bromate 312
- Yates S B drug extraction III function of preliminary maceration in relation to the percolation of *belladonna root* 320
- Yavorsky M A pharmacology of galinsoga 86
- Yorke W biological problems in chemotherapy 90
- Young P standardization of potassium dichromate 15
- Youngken H W eminent American pharmacognosists of nineteenth century 80
- further studies on psyllium seed 70
- microscopy of powdered desiccated endocrine glands 319
- Z
- Zanger H modern organic solvents 131
- Zankle W degradation of camphors and diketone camphanes in animals 84
- Zappert R detection of organic compounds by means of spot reactions IX (1) detection of acetic acid by formation of indigo (2) detection of methyl ketones by conversion to indigo dyes 170
- Zerban F W sugar comparison of reducing sugar methods 17
- Ziener new method for dry purification of mercury 205
- Zimmerman H treatment of angina pectoris by straphanthin 196
- Zimmerman L effects of eserine and acetylcholine on gastro-intestinal motility in normal dogs 86
- Zondek B chromatophoretic principles of pars intermedia of pituitary 60
- Zucker T F blood sugar curves in normal and diabetic dogs after intravenous injections of insulin 139
- Zunz E action of ergoclavine on diuresis 243
- maxima doses of galenic preparations of heroic drugs 348
- necessity of controlling pharmaceutical specialties 27
- Zwemer L inactivation of diphtheria toxin *in vivo* and *in vitro* by crystalline vitamin C (ascorbic acid) 163

INDEX OF SUBJECTS

A

- A B D capsules 37
 Abies sibirica composition of ethereal oil of 278
 Absorbent medicine for internal use 254
 Abszessin 355
 Abusan capsules 197
 Acacia 26
 effect of intravenous injections of on physico chemical properties of blood 82
 identification reactions for 12
 mucilage of and detection of oxidase in 13
 solutions physicochemical studies on III osmotic pressures of solutions of arabic acid and sodium arabate 150
 Acecolex 254
 Acetanilid ratio of toxicity of to its antipyretic activity in rats 240
 stabilization of hydrogen peroxide especially by 174
 Acetanilide poisoning clinical and experimental study of 191
 Acetcarbromal 37
 Acetic acid detection of by formation of indigo 170
 Acetone *n* butanol and ethanol analysis of in aqueous solution 214
 Acetonitrile test for thyroid 189
 Acetyl beta methylcholine action of on ventricular rhythms induced by adrenaline 183
 chloride use of in treatment of neurogenic bladder and allied conditions 34
 Acetylcholine effects of on gastro intestinal motility in normal dogs 86
 value of in ophthalmology 90
 Acetylsalicylates decomposition of 214
 Achillea millefolium Linné volatile oil of 4 160
 Acid uric elimination of from rats liver by action of cinchophen and tolysin 28
 indices of official oils and waxes lime liniment of the Belgian Pharmacopoeia 214
 Acids aromatic body temperature changes produced by sodium salts of some 84
 Acids organic assay methods for salts of 17
 Acidum aceticum 54
 Acimo analysis of 62
 Acne quantitative estimates of hydrogen sulphide in lotions used in treatment of 13
 Aconite chemical composition and physiological assay of 82
 dispert 37
 root detection of aconitine in 8
 Aconitine detection of in aconite root 8
 Aconitum napellus extract of chemical composition and physiological assay of aconite 82
 Acorus calamus seed and seedling of 204
 Acriflavine emulsion simple formula for 179
 Activated charcoal 299
 Adepdelen 325
 Aderol 37 197
 Adexoline 93
 Adhesive plaster irritants in 240
 plasters lesions produced by and method of determining adhesive power 62
 Adiposettes 38
 Adol potion 355
 Adonidin minimum emetic dose with 183
 Adonis vernalis method of extracting active principles of 282
 Adormine tablets 38
 Adrenal cortex hormone effect of on hypertension and on cardiovascular system 34
 Adrenaline 207
 action of acetyl beta methylcholine on ventricular rhythms induced by 183
 inhalation of for the relief of asthma 343
 Advertising place of a field representative in cooperative professional 81
 Aeciferrolstroop with manganese 94
 Aesulus turginata blume saponin of the seed of 282
 Agranulocytosis due to amidopyrin 30
 Agrypnal ampuls 38
 Albicol 38
 Albumin tannat 294
 Alcohol attempts to modify the concentration of in the blood after intravenous administration of 240
 concentration of when stored in wooden vessels 226
 detection of benzene in 217
 determination of in tinctures 215
 extent of absorption of at intervals after oral administration 183
 injected intravenously effect of habituation to rate of metabolism 336
 Alcoholism experimental studies in IV attempts to modify the concentration of alcohol in the blood after intravenous administration of alcohol 240
 Alcohols estimation of in essential oils 64
 Aldehydes and ketones improved hydroxylamine method for determination of displacement of oxime equilibria by means of pyridine 8
 Aletemilch 38
 Algolin tablets 142
 Alkaloid containing poisonous drugs detection of in powdered drugs 294
 Alkaloidal drug extracts the air lift extractor applied to the analysis of 117
 salts estimation of by direct titration of their acid radicals 215
 salts titration of use of porrier blue as indicator 117
 Alkaloids determination of application of the mercurimetric method to new biological products 215
 determination of in injectable solutions 294
 distribution of in different parts of central nervous system and their quantitative microdetermination in tissues II quinine and mescaline 241
 fat water solubility coefficient of 242
 of fumaraceous plants pharmacological action of II corydine 336
 quantitative determination of with bromine 118
 rotatory power of various 295
 synthesis of new medicinal 157
 Alkannin microchemical detection of magnesium and aluminum with and naphthazarin 168
 Alkoxybenzamidines substituted 92
 Alkoxy cumarins relation between odor and constitution in the case of 182
 Alkylhydroxybenzenes anthelmintic studies on I, alkylpolyhydroxybenzenes 27
 anthelmintic studies on II ortho and para *n* alkylphenols 27
 anthelmintic studies on III 6 *n* alkyl meta cresols 27
 anthelmintic studies on IV isomerism in poly alkylphenols 27
 anthelmintic studies on V phenols with other than normal alkyl side chains 27
 6 *n* alkyl meta cresols anthelmintic studies on 27
 oral toxicity of 83
 5 5 Alkylphenylbarbituric acids synthesis of 6
 Alkylpolyhydroxybenzenes anthelmintic studies on 27
 Allergy 343
 Alleton 94
 Allipropan tablets 38
 Allium contribution to the determination of preparations of 241
 Alloform 94
 Alloton 38 197
 Allyarsin 94
 Allylpropynal 38
 Aloe evaluation of 20
 Alom examination of three samples of 215
 Alomin 254
 Aspecine oil 94
 Alpha amylase determination of 215
 dinitro *o* cresol toxic reaction to 340
 dinitrophenol some effects of on pregnancy in white rat 83
 isomorphines hydrogenation of 3
 Althea leaves and root evaluation of 226
 Aluminum estimation of zinc in presence of 316
 acetate dispers 38
 and magnesium microchemical detection of with alkannin and naphthazarin 168
 sensitive reagent for separation of aluminum and beryllium 216
 subacetate molecular solubility of 274
 A M O antiseptic solution 355
 Ambion 142 355
 Amebiasis observations on antigens for complement fixation in 140
 Amide nitrogen determination of in plant tissue 216
 Amidopyrin agranulocytosis due to 30
 Amidopyrine detoxification of by sodium amytal 192
 and dinitrophenol (2 4) detection of 8
 effect of on leucocyte count 183
 inhibition of leucogenic activity in rabbit by certain

- cyclic compounds, 83
toxic reactions of 249
Amidopyrine and amytal effect of on blood picture of the albino rat after a deficient diet 338
Amine salts of antimonio and benzenestibonic acids 54
Amines and diamines with ethylene grouping chemical and physiological study of 54
2 Aminobenzimidazole structure and derivatives of 54
p Aminobenzoic acid determination of esters of 118
Aminogen 254
p Aminophenol hydrochloride use of as a reagent for cupric and ferric ions 120
8 Aminoquinoline derivatives of as antimalarials IV 252
Ammonia determination of 62
and amide nitrogen determination of in plant tissue 216
Ammonium aurothiosulphates preparation and properties of 6
molybdate use of as a microchemical reagent 164
Amos throat water 355
Amphopulmon ampuls 143
Amphyl 143
Amylnitrite use of in cases of contraction ring 252
Amylolytic activity determination of in pancreatin 15
Amytal effect of upon pilocarpine induced submaxillary and gastric secretion 183
and amidopyrine effect of on blood picture of the albino rat after a deficient diet 338
Analeptin preparation and chemical composition of synthetic 142
Analytical methods notes on some with special reference to their teaching value 118
Androcalcon H 254
Androsterone clarification of constitution of 116
Androstina 38
Anesthetic new 90
Anesthetic properties of trichlorethylene study of the 340
Anesthetics some colored local 109
local testing of by sciatic nerve block in guinea pig 83
special detection of cocaine and novocaine with reference to smuggled goods 8
special reference to cocaine and novocaine in illegal trade 295
Angua pectoris value of strophanthin in 92
Angual tablets 38
Angostura bark 70
Anhydron value of as drying agent 3
Animal charcoal pills 143
tissues determination of total lipid in plant tissues and 14
Anusol oil preliminary report on study of from Kuangsi 208
Anox 197
Antacid preparations 178
Antagosan 255
Antagosin 355
Anterior hypophysis hormones of the 116
pituitary clinical manifestations of dysfunction of 57
pituitary general physiology of 57
pituitary growth hormone of 289
pituitary studies on the thyrotropic hormone of 112
pituitary extract 255
pituitary and anterior pituitary like substances 289
thyrotropic hormone separation of of pituitary 59
Antetestin 355
Anthesin 355
Anthracene oils use of for the defence of crops 273
Anthranic acid microdetermination of zinc by means of 317
Anthrex suppositories 355
Anti cholera serum treatment of cholera with new 2
Antidotes I general plan 31
Antigilda 197
Antimalarial drugs of natural origin 343
Antimalarials derivatives of 8 aminoquinoline as IV 252
Antimenogococcal serum a method for titrating the protective action of 152
Antimenogococcal serum protection of mice against menogococcus infection by polyvalent 268
Antimenogococcus serum notes on the concentration and purification of 96
Antimonio acid amine salts of and benzenestibonic acid 54
Antimony compounds complex pentavalent with aromatic polyhydroxy compounds 55
compounds therapeutic bactericidal and antiparasitic organic 93
content in drugs consideration of the used for destruction of schistosomes 344
trichloride differentiation of vitamin A from carotene by means of antimony trichloride 130
Antiparalysis serum one hundred per cent effective ness with 45
Antipneumococcal serum a new method of titration of by the neutralization of the antibodies *in vitro* 203
Antipolymyelitis serum virus adsorbed to alumina gel for production of in sheep 45
Antipyretics 252
Antipyrine contribution to the microchemistry of 216
Antistreptococcal serum 152
Antistreptococcal serums application to of a new method of titration by neutralization of the antibodies *in vitro* 208
Antitoxic serum new method of treatment of diphtheria with 45
Antityphoid sera virulence tests for typhoid bacilli and antibody relationships in 152
serum new 96
Antypol 143
Antutrin S 255
Apicosan N 197
Apical detection and determination of in viscera 131
pharmacologic tests of 83
A P L 254
Aplona 38
Apocupreins pneumococcal value of 153
Apomorphine action of upon small intestine in non anesthetized dogs 84
hydrochloride preparation of for injection 235
Apoquinine pneumococcal value of 153
and apoquinidine 206
Apothecaries in Landau (Pfalz) history of the 322
of the city of Kouigsberg history of the The Adler Apothecary 332
of the Hague 237
Apothecary of the Golden Eagle in Landburg on the Warther history of the 332
Apothyrin dragees 354
Apparatus titration continuous reading 19
Aquilox 143
Arabic acid osmotic pressures of solutions of and sodium arabate 156
Argyrol collargol electargol and protargol reactions for the differentiation of 296
identification of 121
Argyrophedrine 355
Arojecol 197
Aromatic acids body temperature changes produced by sodium salts of some 84
waters distillation of for determination of volatile constituent 9
Aromatics noteworthy new special 278
and volatile oils advances in the field of in 1933 ketones 102
Arsacetium 255
Arsanilo acid N (*p* dimethylamino benzal) chemo therapeutic testing of 90
Arsenamides compounds containing the As N linkage 211
Arsenates volumetric determination of 216
Arsetten 38
Arsenic determination of in tonicum 128
organic compounds of 56
presence of in bismuth preparations 19
quantitative determination of small amounts of 217
triple poisoning by 172
Arsenical Fowler Solution 235
Arsenicals K 324 and K 352 trypanocidal action of on infections in mice and rabbits 336
Arsenobenzene derivatives assay of several 165
Arsenobenzene chemical examination of 217
Arsine poisoning by 249
Arsphenamine 162
ocular reactions due to 249
poisoning occurrence of among negro women 341
Artemisia new crystalline principles from Indian 20
Rigida (Nutt.) Gray oils of 160
Arthrorheum 356
Ascaric fluid partition of phenol between olive oil and serum in 164
Ascorbic acid (vitamin C) comparison of oral and subcutaneous administration of protective doses of 241
acid inactivation of diphtheria toxin *in vivo* and *in vitro* by crystalline 153
acid influence of on sensitization of guinea pigs to neoarsphenamine 84
acid sensitive spot reaction for 118

- acid total content of human blood method of determination 113
 acid (cevitamic acid) use of in the treatment of infantile scurvy 34
 Askaridol dragees 197
 Aspergillus niger action of aqueous extracts of drug plants on 270
 Aspirin effects of phenacetin and respectively upon action of phenobarbital 245
 Astringent lotions 74
 Atabrin 254
 Athlete's foot, 344
 Atomic weights committee on fifth report of of the International Union of Chemistry 160
 Atophan poisoning 191
 (cinchophen) therapy and the liver 346
 Atropine action of on reanimation of heart in second dry chloroform syncope 240
 distribution of in different parts of central nervous system and their quantitative microdetermination in tissues 241
 eye ointments deterioration of on storage 319
 group homeopathic tinctures of 71
 study of commercial drugs containing 206
 Aurotherapy dangers in 249
 Avertin pentobarbital and chloral hydrate relative efficiency of a series of anaesthetics as antidotes to sublethal and lethal doses of 338
 anaesthesia treatment of tetanus with 344
 Azo dyes sulphide analogues of having bactericidal properties 345
 Azochloramid 354
 bacterial action of 45
 use of in root canal antiseptics 345
 Azouline calcium L-B 356
 Azulenogenic sesquiterpenes color reaction of 298
- B
- Bacillary dysentery cause of in infants and children 96
 Bacteria growth of in organic acid media 2
 in water samples effect of temperature of storage on 152
 Bacterial cells microscopic method of distinguishing dead from living 208
 Bacteriophage nature of formalin inactivation of 152
 use of in the treatment of urinary infections 269
 I studies on the nature of 268
 II studies on the nature of 269
 Bacterium coli action of aqueous extracts of drug plants on 270
 typhi flavum study of the so called 269
 Badianus manuscript an Aztec pharmacopoeia 332
 Bakelite containers 235
 Baldronit 197 255
 cum Nitro 197
 Balsam of Peru hypersensitivity of skin to 88
 Barbitals titration of with silver nitrate 9
 Barbiturates sex difference in white rat in tolerance to certain 84
 and strychnine elimination of 189
 Barbituric acid derivatives determination of in urine 212
 Bath preparations XIV 206
 XV, foot baths 297
 Bedsores treatment of 345
 Beechwood lignin product of reaction of carbohydrates in the determination of 50
 Belgian pharmacopoeia IV some remarks on 24
 Belladonna percolation of 319
 dispers 38
 root the effect of fineness of powder and of variation in solvents on the percolation of 227
 root function of preliminary maceration in relation to the percolation of 320
 Bellergal 38 143
 Bellier number study of its use for the detection of peanut oil in olive oils 297
 Benedict's test modification of 212
 Benzaldehyde determination of small quantities of chlorine in commercial 9
 Benzene detection of in alcohol 217
 experimental research on the toxicity of the vapors of 250
 ultra violet absorption spectrum of 297
 Benzenesulphonic acid amine salts of antimonious acid and 54
 Benzofuroquinolines 109
 Benzoic and cinnamic acids identification of in microsublimates of balsams and resins 297
 Benzylephedrine use of as analgesic in chaulmoogra injections 34
 Beryllium estimation of zinc in presence of 316
 separation of aluminum and 216
 Beta carotene analysis of, and leaf xanthophyll in thirteen plant tissues 10
 isomerides hydrogenation of 3
 Bevonite 197
 Bibrolur 93
 Bichloride of mercury quantitative study of renal injury in a case of acute poisoning by 250
 Bichromate skin sensitivity to 183
 Bickmorin 197
 Bile salts influence of on the nervous system following intraspinal usage 136
 Bilirubin Van der Bergh reaction of variations in xanthochromic cerebrospinal fluid 60
 Binamon 356
 Biochemistry inorganic note on 289
 Biocholine 255
 Biology for pharmaceutical students 334
 Bio Talc 38
 3,3' Bis (azometa phenylenediamine) 4,4' dihydroxyarsenobenzene and 3,3' bis (azo 2,6 diaminyridine) - 4,4' dihydroxyarsenobenzene preparation and properties of 211
 Biseptol 255
 Bismo kaolin 255
 Bismurung 255
 Bismuth assay of national formulary preparations containing 298
 leicrins an injectable preparation of 241
 poisoning pharmacodynamics and toxicology of bismuth 341
 presence of arsenic in preparations of 19
 violet use of in malaria and for chancroids 34
 Bisteril bacilli 197
 Bixa orellana L analysis and therapeutic action of 20
 Black mint peppermint oil from cultivated in southern Sweden 161
 Bleaching powder determination of manganese in 168
 Blimal 39 197
 Blood attempts to modify the concentration of alcohol in the after intravenous administration of alcohol 240
 alcohol relation of to intoxication in man 241
 effect of intravenous injections of acacia on physiological chemical properties of 82
 iron methods for determining comparison of wet and dry ashing 57
 relation of calcium to formation of 140
 serum determination of indoxyl content of 292
 sugar and vegetable extracts 190
 total ascorbic acid content of human method of determination 113
 urea estimation of 289
 volumetric determination of sugar in 292
 boiling point relation of and vapor pressure to the composition of glycol water mixtures 3
 Bolanol 256
 Bone phosphatase activity of in chronic fluorine poisoning 241
 Borax and sulphur in cosmetic preparations 74
 glyceric water solutions reactions of, 298
 Borhamyl 356
 Boric acid skin disturbances through the use of defatting agents containing 191
 acid containing fat reducers 88
 acid preparations toxicity of skin disturbances through the use of defatting agents containing boric acid 191
 Botany course value of as a foundation for the pharmacognosy of stem and bark drugs 135
 Brazilian euphorbiaceae essential oils from 204
 flora myriadiatics and myotics from 273
 B R 1 colloid 255
 Brilliant green value of as a local antiseptic 153
 British Pharmaceutical Codex 1934 73 178
 Pharmaceutical Codex 1934 medical aspects of 73
 Pharmaceutical Codex 1934 pharmaceutical aspects of 73
 Pharmaceutical Codex review of 73
 Pharmacopoeia revision notes on 133
 Pharmacopoeia scheme for the identification of the simple liquid preparations of the 125
 Brocanal 39 94 198
 Bromides detection of small quantities of in sodium chloride 298
 determination of small amounts of in sodium chloride 62
 toxic reactions of 2,0
 Bromine electrometric determination of in the presence of large amounts of chlorine 298
 quantitative determination of alkaloids with 118
 Bromostrotruran 256
 Bromural and veronal fusion curves of 98

- Bronchovydin ointment 143
 Brucella abortus toxic principles of 1, preparation of toxicity and biochemical nature of alcoholic precipitate 53
 Brucellasis studies of correlated human and bovine 153
 Brucine and strychnine part \\\ \\\ \\\ 277
 Brushless shaving creams 326
 Bulbocapnine ratio between effective and lethal doses of in the cat 242
 Bupleurum falcatum L. constituents of roots of 284
 Burns 34
 preparations for 326
 n Butanol, analysis of in aqueous solution 214
 Butterfat determination of in food 298
- C
- Cadmium estimation of copper and its separation from manganese nickel cobalt etc 126
 Caesium new spot reaction for 209
 Caffeine coffee and decaffeinated coffee effect of upon blood pressure pulse rate and simple reaction time of men of various ages 183
 and theobromine effect of upon digitalis toxicity 191
 content of, in decaffeinated coffees and value of decaffeinated coffees in nutrition 63
 determination of in decaffeinated coffees 299
 micro-determination of by colorimetry 165
 per se and caffeine beverage effect of on reaction time in young adults, 84
 Cal B, 256
 Calbrolact 356
 Calcibronat chemical experience with 192
 Calcidex 256
 Calcidrine 39
 Calciferol treatment of low calcium tetany with 345
 Calcinate 256
 Calcio-coramine 256
 Calciphos 39
 Calcium availability of in foods containing oxalates 289
 and phosphorus analysis digesting biological materials for 217
 aurothiosulphates preparation and properties of 6
 chloride solutions effect of sterilization of 153
 compounds comparative study of the absorbability of 137
 Eci 256
 for injection 235
 gluconate stable solutions of 55
 glycerophosphate analysis of 62
 hydroxide solubility and determination of 218
 hypochlorite some observations on the germicidal efficiency of 269
 hypochlorite value of as volumetric oxidizing agent stability and standardization of determination of ammonia 62
 in serum volumetric determination of 289
 lactophosphate history of preparations of 26
 phosphate colloidal of blood serum and calcium partition in serum 57
 relation of to blood formation 140
 retention of by infants fed evaporated milk containing cod liver oil concentrate 346
 Calmosine 143
 Calmural 198
 Calmuran 39
 Calogran 256
 Calomel physical and chemical investigation of 47
 Calsimil 143
 Calumba root bitter principles of 210
 Camirol 39
 Camphochin 356
 Camphor comparison of toxicity and general actions of natural and synthetic on guinea pig 27
 maximum yield of obtained from *Laurus Camphora* 155
 oil and vitamins A and D use of in the treatment of burns 354
 production of from *Ocimum canum* 160
 titrimetric determination of in drug preparations 218
 Camphors and diketone camphanes degradation of in animals 84
 Candicine contributions to pharmacology of 137
 Cane sugar content of of small volumes of solutions determination of from specific gravity and specific rotation 10
 Canfdrol ampuls 256 356
 solution 256
 Cantan 39 94
 Cantharidin new microchemical reaction of 165
 Capsules accuracy and speed factors in 336
 Carbohydrates product of reaction of in the determination of beechwood lignin 50
 Carbon modified chromic acid method for determination of 10
 and hydrogen preheater for the microanalytic determination of 299
 dioxide determination of in confined atmospheres 299
 monoxide poisoning chronic 250
 monoxide poisoning intravenous use of methylene blue in the treatment of, and cyanide poisoning 36
 tetrachloride and chloroform differentiation between 300
 tetrachloride determination of in chloroform 119
 tetrachloride experimental investigation on its toxic action by repeated inhalation 137
 Carcinoma as an electrical phenomenon of protein substances 192
 Cardiotonic drugs investigation of 282
 Carmacin tablet 256
 Carotene differential reactions between and oils rich in vitamin A 130
 and vitamin A absorption of 239
 differentiation of vitamin A from by means of antimony trichloride 130
 Carotenoids rapid quantitative method for the determination of the common analysis of beta carotene and leaf xanthophyll in thirteen plant tissues 10
 of butter 57
 Carqueja (*baccharis genistelloides pers*) contribution to the study of a medicinal plant of widespread use in Argentina 280
 Caspetol 257
 Castor beans toxicity of 191
 oil newer uses of 345
 oil purgative action of and alimentary disequilibrium 239
 oil refining 280
 oil solubility of distribution coefficient between oil and water of substances completely miscible in two solvents 119
 Cavodol 257
 C diphtheric isolation of virulent and highly toxigenic strain of 153
 Ceanothyn 257
 Cebione 39
 Cedro wood oil Brazilian 4
 Cellophane and kuprophane as dialysis membranes 218
 Cellulose adsorption charcoal prepared from crude 110
 varnish 233
 Centrifugal force nomogram for 3
 Cereus coryne alkaloids of 157
 Certosed 356
 Cetyl alcohol applications of in cosmetics 75
 Cevitimic acid (ascorbic acid) use of in the treatment of infantile scurvy 34
 Chai Hu (*Bupleurum falcatum L*) constituents of roots of 284
 Chamomile cosmetics 326
 Chancreoids use of bismuth violet in malaria and for 34
 Chapparro amargoso use of in treatment of amebic dysentery 345
 Chapping preparations for 25
 Charcoal adsorption prepared from crude cellulose 110
 activated 299
 Charcoals adsorption of strychnine sulphate by various and by Lloyd's reagent 49
 Chaulmoogra use of benzylophedrine as an analgesic in injections 34
 oil in the pharmacopœias and in commerce 300
 oils in pharmacopœias and in commerce 50
 Chemical constitution and taste relations between 239
 Chemistry how should fundamental courses in be taught in a college of pharmacy 135
 some recent contributions of, to medicine 163
 Chemotherapeutic research some lines of 346
 Chemotherapy biological problems in 90
 Chenopodium ambrosioides L saponins of 51
 Cherry gum emulsifying and coating properties of 134
 laurel water preservation of and solution of hydrocyanic acid by paraffin oil and vaseline 71
 laurel water and solution of hydrocyanic acid preservation of by paraffin oil and official vaseline 227
 Chih Mu anatomy of the drug 317
 Chinese Insect Drug Chiu Hsiang chung study of oil of 50
 Chinoform pharmacopœial test for 170
 Chinoform powder 198
 Chinoform drages 198
 Chios turpentine 4

- Chiu Hsiang chung Chinese insect drug study of oil of 50
 Chloracetopyrocatechol some thiazol derivatives of 55
 Chloral use of in infant therapy 102
 formamide melting point of 300
 hydrate distribution of in different parts of central nervous system and its quantitative micro determination in tissues 242
 hydrate pentobarbital and avertin relative efficacy of a series of anaesthetics as antidotes to sublethal and lethal doses of 338
 hydrate suppositories preparation of 236
 suppositories note on the preparation of 22
 Chloramine T and calcium hypochlorite some observations on the germicidal efficiency of 209
 Chlorate ion rapid test for qualitative and approximately quantitative test especially suitable for work with plant extracts 62
 Chloride modified Volhard method for determination of 10
 and potassium ions volumetric microdetermination of 218
 Chlorinated and brominated hydroxy biphenyls 13
 Chlorine bactericidal action of 96
 available determination of in hypochlorite solutions by direct titration with sodium thiosulphate 13
 determination of small quantities of in commercial benzaldehyde 9
 electrometric determination of bromine in the presence of large amounts of 298
 Chloroform determination of carbon tetrachloride in 119
 and carbon tetrachloride differentiation between 300
 and carbon tetrachloride reaction for distinguishing between 218
 preservation of for use in anesthesia 227
 safety color for 78
 Chlorogalum Pomeridianum sapogenins obtained from 53
 Cholera treatment of with new anti cholera serum 2
 group of vibrios antigens of 209
 Cholesterol content of vitamin D in salve bases containing 100
 fixed color standard for determination of 165
 quantitative determination of free and as ester without the use of digitonin 63
 Choloton for injection 257
 Choloton 356
 Chondrocin 257
 Chondrus crispus some properties of polysaccharide complex from 5
 Choreia treatment of with mirvanol 36
 Christ as an Apothecary 181
 Chromatographic adsorption analysis in pharmacy 300
 adsorption and its applications 219
 Chromium compounds toxicological study of some 31
 pigment micro reaction of 119
 Chromosom 257
 Chrysarobin dioxyanthranol 1 8 a substitute for 35
 Cibalgan tablets 98
 Cimicifuga racemosa constituents of the rhizome of 162
 Cinchona identification of preparations of by the erythroquinine and thalloquinine reactions 165
 alkaloids ketone formation with sodium amide 99
 alkaloids modified part II 275
 alkaloids pneumococcal value of III apocupreines (apoquinine) 153
 alkaloids value of in pneumonia miscellaneous alkaloids and some hydrocupreine ethers 85
 and Belladonna percolation of rate of alkaloidal extraction and effect of degree of comminution 319
 bark alkaloid content of and cinchona decoctions 11
 bark preparations production and tests of 63
 decoctions alkaloid content of and cinchona bark 11
 in Amani 225
 plant in Russia 273
 Cinchonidine specific rotary power of the salts of 277
 Cinchonine specific rotary power of the salts of 277
 Cinchophen elimination of uric acid from rats liver by action of and tolysin 28
 peptic ulcers produced by feeding to mammals other than the dog 140
 poisoning by 31
 (Atophan) therapy and the liver 346
 Cinnamic acids identification of in microsublimates of balsams and resins 297
 Citopopeen 39
 Citral reaction for the identification and determination of 166
 Citric acid 110
 Citrine ointment assay of 63
 Citrofinol 198 257
 Citro gold 143
 Citronella determination of in Java citronella oil Dutch standard method 301
 Citronella oil Java 160
 Citronellol Rhodinol isomerism study of by means of Raman spectrography 208
 Citrus oils value of ultraviolet fluorescence as test for determination of substances producing the fluorescence 119
 Civet gathering of 22
 Clabin 356
 Cleansing creams new 74
 cream containing magnesium hydroxide 233
 Cloves sources of 70
 Cluexin 198
 Coal tar isolation of 1 2 dimethyl naphthalene from 55
 Cobalt estimation of copper and its separation from cadmium manganese nickel etc 126
 nitrate use of as a reagent for pharmaceutical purine preparations 171
 Cocaine new falsification of 11
 reactions of solutions of, on sterilization and storage 48
 salts study of the activity of different 239
 separation and detection of in mixtures of cocaine and procaine 301
 special detection of and novocaine with reference to smuggled goods 8
 Cocor butter use of as excipient in pills containing extracts 132
 Codalgin 356
 Codeine addiction to 31
 comparative study of analgesia produced in normal subjects by morphine heroine and dilaudid 245
 morphine and dilaudid comparison of motor effects of on Thierry fistula 188
 pharmacopoeial test for 170
 respiratory effects of morphine and related substances III effect of morphine dyhydromorphine dihydromorphinone (dilaudid) and dihydrocodeine (dicodid) on respiratory activity of rabbit 30
 Codorit tablets 39
 Codex and public pharmacy 325
 Cod liver oil critique of 1934 interim revision of text and assays for U S P 24
 oil concentrate retention of calcium by infants fed evaporated milk containing 346
 oil determination of in emulsions 301
 oil effects of cottonseed meal on stability of vitamin A in 116
 oil iodine content of 50
 oil medicinal obtained by steam methods vitamin content 280
 oil ointment Unguentolan investigation with 193
 oil treatment of wounds 346
 oil vitamin potency and associated characteristics of average 219
 Coffee effect of upon blood pressure pulse rate and simple reaction time of men of various ages 183
 and decaffeinated coffee effect of upon tremor in normal men and women 239
 Coffees decaffeinated caffeine content and value of in nutrition 63
 Coffey 94
 Colchicine new physiological property of 183
 Colchicum dispers 39
 Cold balms 75
 Colds new explanation of 269
 prescriptions for 34
 Coli aerogenes group comparative studies of presumptive test media for 45
 Collargol argyrol electargol and protargol reactions for the differentiation of 296
 Colloidal gold in inoperable cancer 346
 iodine value of in medicines and cosmetics 91
 silver determination of in organic medicinals application to ointments 166
 silver (protargol) researches on the modification of the physicochemical properties of with the length of time of its preservation 227
 Colloid mills and cosmetics 326
 Colloidal calcium 257
 iodine 257
 Collumol 39 198

- Colophony, East Indian 225
 Colorimetric analysis and μ determinations ap-
 plicability of the color and luminescence com-
 parator of Rojahn Heinrich for 301
 methods of analysis theory and physicochemical
 basis of, 301
 Colorimetry microdetermination of caffeine by 165
 Comalissatum 39
 Composite leaves V pharmacognostic study of 318
 flowers pharmacognostic study of 70
 Conine and nicotine microchemical detection of 317
 Copaiba balsam examination of 64
 Copha in tablets 198
 Copper colloidal value of, in septicemia 90
 detection and determination of in pharmaceutical
 preparations 11
 determination of in foods with special reference to
 milk 219
 determination of in inorganic matter 64
 determination of minute quantities of in milk 11
 determination of small quantities of 166
 drop method of detection of 301
 estimation of and its separation from cadmium
 manganese nickel cobalt etc 126
 iodometric determination of 11
 modified iodometric method for determining 119
 numbers of drugs used most 65
 potentiometric estimation of 120
 quantitative microdetermination of 166
 sulphate decomposition of hydrogen peroxide in
 presence of glass wool and 274
 use of potassium stannous chloride in the volumetric
 determination of 120
 Corcumen 40 198
 Coriander (*Coriandrum sativum*) report on examina-
 tion of samples of Indian and foreign 219
 Coriaria japonica A Gray poisonous constituents of
 284
 Corran tablets 356
 Cortical ampuls 258
 fluid 356
 liquid 258
 Cortidyn 198 356
 Corvis 40
 Corydaline hydrochloride action of on the isolated
 small intestine 240
 Corydalis aurea preliminary chemical examination of
 53
 Corydine pharmacological action of 336
 Corynanthine antagonism of to epinephrine 184
 constitution of 206
 Cosmetic creams preparation of 25
 formula 17
 pomade 233
 preparations borax and sulphur in 74
 products dangers of 341
 products hydrogen ion concentration of I fatty
 skin creams 75
 Cosmetics applications of cetyl alcohol in 75
 history of in modern times 79
 history of in recent times 181 332
 in recent times history of 238
 progress in in 1934 233
 report on progress in 1934 81
 Cosmetology pharmacological and toxicological view
 points in 188
 Cottonseed meal effects of on stability of vitamin A
 in cod liver oil 118
 oil effect of gossypol on color of 280
 Coula edulis seed oil of 280
 Coumarins improved method for the synthesis of
 by v Pechmann's method 286
 Cows milk antirachitic comparative study of anti-
 rachitic value of irradiated cows milk and of
 milk produced by cows fed irradiated yeast 113
 Cratogeol tablets 258
 Cream or Watersalve preparation of tenacious 72
 Creams claims for 326
 preparation of cosmetic 25
 Creatine and creatinine microchemical identification of
 220
 Cresol soap solution determination of cresol content of,
 302
 Crinex 144
 Crinol salve 198
 Croton resin I toxicity studies using goldfish 28
 oil action of substances isolated from 184
 resin II toxic and vesicant action of certain of its
 derivatives 28
 resin III combined acids 4
 Crude drug extraction 320
 Crystal precipitation by salting out 302
 violet jelly 258
 Cumasina preparations 357
 Cupreine new color reaction of and its application to
 the determination of guanine 17
 Cupric and ferric ions β aminophenol hydrochloride as
 a reagent for 120
 Curacene tin compound tablets 357
 Curare 158
 and its constituents, pharmacology and therapeutics
 of, 240
 Curarine case of tetanus treated with 90
 Cyanide separation and detection of 64
 poisoning 250
 poisoning intravenous use of methylene blue in the
 treatment of and carbon monoxide poisoning 36
 poisoning and its treatment 341
 Cyclobis 258
 β Cyclopentyl and β cyclohexyl glucosides biochemical
 synthesis of 110
 Cyclopropane anesthesia in obstetrics 346
 Cymbopogon flexuosus stapf and cymbopogon martin
 stapf, var motia oils 102
 georgii volatile constituents of 49
 Cynhepatil 40
 Cysteine hydrochloride 258
 hydrochloride buffered 144
 Cystine separation of tyrosine from 129
 Cystoblettes 40
 Cytisus scoparius natural distribution of in Virginia
 with special reference to soil reaction 204

D

- Danamine 40 198
 Danarsine 40 198
 Daphne genkwa constituents of 284
 Daphnia propagation of for experimental use 137
 Darmiol 144
 Darso stop tablets 258 357
 Datura stramonium food poisoning from 250
 stramonium and D metel fertilization of in the
 incompatible cross 204
 Daucaysatum 40
 Davitamon A D 357
 Decaffeinated coffee effect of upon blood pressure
 pulse rate and simple reaction time of men of
 various ages 183
 coffee effect of upon tremor in normal men and
 women 239
 Decholine 94
 Demarodul 40
 Denatured salts contribution to the knowledge and
 determination of 156
 Dentifrices 233
 Dentists and pharmacists coöperation between 81
 and pharmacists professional relations between
 182
 Depilatory developments 328
 Deriphyllin ampuls 40
 oral 258
 suppositories 40
 Dermabella skin oil 258
 Dermatitis preparations for 346
 Dermichthol 357
 Derris storage of 225
 resin constituents of 55
 root determination of rotenone content of 120
 root determination of rotenone in and resin 68
 root uses of 234
 Devegan 258
 Dextrose therapeutic use of 35
 Diacedan 40
 Dialkylaminoethoxyethyl β - aminobenzoates local
 anesthetic action of 337
 Diaminoacridine determination of in euflavine 302
 Diatomaceous earth East Indian 225
 Diaturasa 94
 Dibrolur 258 354
 Dicalcium phosphate with viosterol 258
 Dichlorofluorescein use of as an adsorption indicator
 220
 Dietetics some aspects of 113
 Diffundol 258
 salbe 144
 Digalol 94
 Digger pine a phytochemical study of the seed of
 284
 pine (*Pinus sabinana*) non heptane constituents of
 162
 Digiland 357
 clinical studies with intestinal and parenteral ad-
 ministration of 193
 Digitalis assay of preparations of in man 184
 assay of on normal and exsanguinated cats 28
 Baljet color reaction of compounds of 167

- cardiac irregularities produced by ephedrine after 85
 chemical study of Sierra Nevada 21
 -dispert 40
 early history of 332
 effect of on pneumonia 103
 flavones from 53
 lanata pharmacological action of and D purpurea 28
 lanata Ehrh pharmacological investigation of 242
 leaf East Indian report of the investigation of 70
 potency of Oregon 184
 proportion of digitoxin in 274
 purpurea digitoxin content of 283
 purpurea glucosides of 51
 purpurea pharmacological action of and D lanata 28
 purpurea and lanata 283
 rectal absorption of in cats 183
 relationship of potency of as determined by different methods 242
 Sardinian 21
 studies on the bioassay of II new leg vein and intramuscular guinea pig methods 138
 studies on the bioassay of III a new diuretic cat method 185
 tincture preparation of relative merits of maceration and percolation 320
 use of rabbits in assay of 337
 U S P standards for 138
 Digitonin behavior of sterols toward 224
 quantitative determination of free cholesterol and as ester without the use of 63
 Digitoxin content of in Digitalis purpurea 283
 cumulative poisoning by 243
 proportion of in digitalis 274
 Dihydroxypropyl esters of fatty acids preparation of and use in emulsions and ointments containing water 106
 Diiododithymol assay of 220
 Diketone camphanes degradation of in animals 84
 Dilaudid comparative study of actions of and morphine on intact small intestine of dog 30
 comparative study of analgesia produced in normal subjects by morphine codeine and heroine 245
 morphine and codeine comparison of motor effects of on Thierry fistule 188
 Dilutions Preparation of according to the Homeopathic Pharmacopoeia 320
 N (β Dimethylaminobenzal) chemotherapeutic testing of 90
 Dimethyl flavin 6 7 dimethyl flavin 9 acetic acid 58
 6 7 Dimethyl flavin 9 acetic acid 58
 Dimethyl 9 L arabo flavin lacto flavin in N/20 57
 1 2 Dimethyl naphthalene isolation of from coal tar 55
 Dinitrenal capsules 259
 Dinitrophenol action of on rate of oxidation of ethyl alcohol *in vitro* 242
 Dinitrophenol (2 4) and amidopyrine detection of 8
 1 2 4 Dinitrophenol blood changes after 138
 case of poisoning by with recovery 88
 α Dinitrophenol chron clesions produced by 250
 2 4 Dinitrophenol detection and determination of 302
 Dinitrophenol effect of on heart 185
 1 2 4 Dinitrophenol effect of on oxygen uptake of rat tissue 139
 2 4 Dinitrophenol effect of repeated washing on stimulation of yeast respiration by 163
 Dinitrophenol effects of on respiration of commercial cake yeast 139
 Dinitrophenol metabolic activity of compounds related to 28
 Diiodotyrosin *in vivo* action of I diuretic action 85
 Diothane solution stability of II 120
 Diotrast 259
 Dioxyanthranol 1 8 a substitute for chrysarobin 35
 Diphenyl compounds therapeutic substances derived from unsymmetrical III some aryl esters of the hydroxy diphenyls 337
 5 5 Diphenylbarbituric acid 212
 Diptheria hyperglucemia in carbohydrate metabolism and treatment with dextrose insulin 140
 anatoxin purification and concentration of 269
 and smallpox simultaneous immunization against 272
 cultures culture media used for routine with a suggested modification of Loeffler's blood serum medium 269
 formal toxoid SS Dresden 144
 new method of treatment of with antitoxic serum 45
 toxin inactivation of *in vivo* and *in vitro* by crystal line vitamin C (ascorbic acid) 153
 toxin skin reaction of 270
 toxin antitoxin gemische neutral T A SS Dresden 144
 toxoid value of alum precipitated 96
 toxoids comparison of value of merthiolate and phenol as preservatives for 96
 use of intradermal injections of toxin toxoid mixtures 153
 value of insulin in toxic 91
 Diploal 259
 α α Dipyrrolyl cerimetric titration of small amounts of by means of as indicator 305
 Disinfectants advances in testing of 96
 laboratory testing of 2
 testing of in the presence of organic matter 270
 tests for 20
 Disinfecting agent hints for use of 2
 Disinfection fallacies and dangers in attempted chemical 203
 Dispensing determination of reasonable or permissible margin of error in II ointments 79
 cabinet aseptic 179
 Dispers 198
 Distilled water sterile apparatus for the preparation of 320
 water sterile preparation of in a vacuum 174
 Distol 41
 Diureticum 41
 Dolorug Balsam 199
 capsules 199
 Dolosin 144
 Dormalets 41
 Doryl solution 199
 Dosarter 259
 Dossalax 199
 Draconal 144
 Drei Nerv Würfel 199
 Dried extracts of the new Swiss pharmacopoeia hygroscopicity of 320
 Drinking waters determination of lead in 167
 Drosera rotundifolia constituents of 108
 Drug code brief history of 334
 extraction II the effect of fineness of powder and of variation in solvents on the percolation of belladonna root 227
 extraction III function of preliminary maceration in relation to the percolation of belladonna root 320
 extraction IV effect of variation in solvents on the extraction of jalap 321
 extraction processes new 23
 plants evaluation of cultivated in 1934 205
 potency fluctuation of during growth 205
 specialties and nostrums certain in tea form 259
 store value of history in 26
 Drugs absorption of through the oral mucosa 186
 absorption of through the oral mucosa II 242
 absorption of through the oral mucosa III fat water solubility coefficient of alkaloids 242
 and bugs 132
 and galenicals identification numbers of V copper numbers of drugs used most 65
 Brazilian in world commerce 172
 constitution and action of 347
 distribution of in different parts of central nervous system and their quantitative microdetermination in tissues VI, chloral hydrate 242
 dynamic action of 140
 effect of altitude on the action of I strychnine 186
 quality of 120
 rationale of new uses for some old 140
 scheme for microscopic examination of 70
 storage of new problems in 228
 Dulcin sweetening agents II microchemical studies of 121
 Duodenin insulotropic hormone of intestinal mucosa 212
 Duroxyl tablets 357
 Dutch pharmacopoeias 325
 Dye solutions therapeutic 193
 Dyes effect of on colonies of certain pathogenic fungi 46
 medicinal 110
 study of injectable 142
 Dysmenural 357

- Neusglei 358
 Education of the pharmacist 334
 Egg yolk vitamin A active substances in, 60
 Elaidic acid rancidity and constitution of, and oleic acid, 60
 Electargol, argyrol collargol and protargol reactions for the differentiation of 290
 Electric micromuffle 303
 Elektrargol kollargol argyrol and protargol identification and differentiation of 121
 Elixir alycin 144
 Embrodex 259
 Emenagon 358
 Emetine toxic effects of 31
 Emmenina liquid 259
 Emulsifiers lipin-containing substances as 47
 Emulsions 321
 hand type homogenizer and its use in making 132
 pharmaceutical 321
 preparation of dihydroxypropyl esters of fatty acids and use in and ointments 106
 studies in III lipin containing substances as emulsifiers 47
 Endocrine glands microscopy of powdered desiccated 319
 Endo-mangalac 259
 Endomin 41
 Endothyrin 41 269
 Entacard 259
 Enteric coatings comparative study of 347
 coatings laboratory method for the study and control 303
 Entoral 259
 Enzyme activity effect of certain salts on 7
 Ephedrine cardiac irregularities produced by after digitalis 85
 alkaloid crystalline forms of 99
 observations on dogs under continued influence of 242
 sources of 108
 Epheprine 41
 Ephepneumine 260
 Epheptogen 260
 Epinephrine antagonism of corynanthine to 184
 Epithel Dragees 41
 Epithelial anesthesia 337
 Epokan merck 358
 Ergobasine new water soluble alkaloid of ergot 206
 Ergoclavine action of on diuresis 243
 and sensibamine action of 243
 Ergometrine 158
 alkaloids of ergot 348
 concerning some pharmacological effects of 377
 isolation of 206
 newly discovered alkaloid in ergot 99
 Ergostabil 199
 Ergosterol 113
 attempt to ketonize 58
 Ergot active constituents and a pharmacological and chemical study of 29
 active constituents of pharmacological and chemical study 99
 active principles 276
 alkaloids 158
 alkaloids effect of on the uterus 85
 alkaloids of ergometrine 348
 biological determination of alkaloids of 186
 chemistry and pharmacology of 276
 cultures saprophytic alkaloidal content and activity of 270
 determination of ergotoxine in 11
 effect of hot solvents on note on effect of storage on activity of 322
 Ergobasine new water soluble alkaloid of 206
 Ergometrine newly discovered alkaloid in 99
 Russian 173
 U S P assay for 29
 Ergotamine tartrate effect of on cerebral circulation of man 29
 tartrate (gynergene) ointment use of in ano vulvar pruritus 348
 Ergotocin 101
 active principle of ergot responsible for the oral effectiveness of some ergot preparations on human uterus 158
 Ergotoxine determination of in ergot 11
 Erinol 144
 Eroxan Noury 358
 Error in dispensing margin of determination of the reasonable or permissible V liquids 236
 Erysipelas hemolytic streptococci in 153
 Erythroquinine reaction identification of preparations of cinchona by the and thalleoquinine reaction 165
 Eserine experiments on the synthesis of part XI 270
 and acetylcholine effects of on gastro-intestinal motility in normal dogs 86
 Lsmodil 142 144
 Essential oils average values for surface tensions of 12
 oil content of drugs improved method for estimation of 220
 oil from mushrooms 104
 oil industry in Seychelles, 103
 oils and their ethanol solutions presence of methanol and formaldehyde in 303
 oils determination of ethyl and methyl alcohols in natural 303
 oils determination of ethyl phthalate in by potassium phthalate method 122
 oils estimation of alcohols in 64
 oils export of from Sicily 1934 103
 oils from Seychelles 103
 oils from Seychelles a survey of the industry and suggested improvements 104
 oils physiological forms of eucalyptus as determined by the chemical composition of and their influence on botanical nomenclature 155
 Estragon and Hyssop a survey of production and characteristics of 278
 Estrin extraction of from female urine after acidification with various acids 103
 Estrogenic hormone 260
 preparations relief of menopause symptoms by 35
 principles occurrence of and gonadotrophic principles in myoma of uterus 7
 Ethacreo 260
 Ethanol analysis of in aqueous solution 214
 Ether ethyl U S P stability of 111
 reaction for peroxide in 122
 solubility of phenylethylbarbituric acid in 311
 studies on dosage of after pre-anesthetic medication with narcotics (barbiturates magnesium sulphate and morphine) 337
 Ethereal oils estimation of in drugs 122
 Ethyl alcohol action of dinitrophenol on rate of oxidation of *in vitro* 242
 alcohol effect of certain drugs on the metabolism of 243
 and methyl alcohols determination of in natural essential oils 303
 bromide detection of very small quantities of in blood and brain tissue 317
 ether U S P stability of 111
 phthalate determination of in essential oils by potassium phthalate method 122
 Etrones separation of from urine isolation of α folliculin from urine of the horse 114
 Eubion 144
 Eucalyptus physiological forms of as determined by the chemical composition of essential oils and their influence on botanical nomenclature 155
 oils development of our knowledge concerning 160
 Euflavine determination of diaminoacridine in 302
 Eumarcon 93
 Eunarcin 37 199
 Euphorbia prunifolia Jacq 225
 Euphorbiaceae essential oils from Brazilian 204
 Eupragin 145
 European tablets 199
 Euryzin 358
 Eusod 41 94
 Eupal hypnosis anesthesia and toxicity 186
 Extra bacterial substances in cultures production of 270
 Extract and fluid extract of coca B P C assay of 304
 of belladonna preparation of dry 322
 of ipecac preparation of aqueous 322
 of malt 122
 of opium determination of morphine in tincture and 308
 Extracts determination of the viscosity of viscous 304
 of drug plants action of aqueous on *Bacterium coli* and *Aspergillus niger* 270
 Eye drops researches with oxybenzoic acid esters for sterilization of 271
 ointments 79
 Ezoidon pine needle tablets 199
 sulphur bath 199

- Fat production of from glucose by molds cultivation of *Penicillium javanicum* van Beijma in large scale laboratory apparatus 50
- Fats antioxidants and the autoxidation of 209
- and oils hydroxy number and acetyl value of 304
- and oils spoilage of III rancidity and constitution of oleic and elaidic acids 50
- heating of and waves 23
- Federal food and drugs act and the pharmacopoeia of the U S 334
- Femine hygiene jellies 76
- Femivir 260
- Feosol S-K F 41
- Perfersan 358
- Ferric chloride use of in poison oak dermatitis 35
- Ferrodic 260
- Ferro salicylate 260
- Ferrous iron determination of in presence of organic matter by Heissig's method 304
- Ferrum reductum evaluation of by the sublimate method 12
- Ferry's meningococcus antitoxin 97
- Fever sores remedies for 35
- Fish liver preservation of for oil production 71
- Flacourtiaceae actual situation of production of oils of in view of their utilization in therapeutics 49
- Flavicine 260
- Flavones from digitalis 53
- Floraform 199
- cream 199
- Fluid extract of coca B P C assay of 304
- of ergot 322
- of ergot in a mixture 331
- of thyme and its preparations 174
- Fluorine determination of in foods 167
- importance of fluorinated methemoglobin in the determination of in industrial hygiene 224
- poisoning activity of bone phosphatase in chronic toxicosis 191
- Folinerin 193 210 358
- Follicular hormone assay of in commercial preparations 187
- Follicle hormone derivatives 290
- α Folliculin isolation of from urine of the horse 114
- Food and drug legislation 26
- and drug legislation national 238
- chemistry twenty five years of 163
- Foods determination of fluorine in 167
- Forapin use of in rheumatic diseases 348
- Formaldehyde presence of in essential oils and their ethanol solutions 303
- Four year curricula in pharmacy comparison of 80
- Fowler's solution investigations on 134
- Frangula dispers 41
- Fruit syrups 25
- Fungi 47
- pathogenic effect of dyes on colonies of certain 46
- pathogenic scalp products and hair of men and women as culture media for certain 46
- Fungicides clinical implications from the testing of 45
- Fusion curves of binary systems bromural and verona with salol and phenacetin 98
- G
- Gadoment 145
- Galactose detection of provoked in urine according to technique of Flessinger and application of method of Fleury and Marquet 12
- Galenic preparations investigations on III Fowler's solution 134
- tinctures of D A B VI intimate knowledge of the tincture 228
- Galinsoga pharmacology of 86
- Gallicetan dragees 199
- Gamboge contribution to the chemistry of 278
- Gardiol W detection of potassium ion with 126
- Garlic and its preparations 91
- Gas analysis micro heat conductivity apparatus for 122
- Gastric secretions 114
- Gastro lymphon 145
- sil use of in nervous hyperacidity 194
- Gauze containing yatron sterilization of 322
- Gelatin use of in medicine 111
- Genitone 145
- Geranium oil characteristics of 1934 Algerian 104
- German apothecary Faenze of the Renaissance 79
- homeopathic pharmacopoeia 24
- specialties review of for 1934 44
- Germicid cachets and tablets 199
- Germicidal substances comparison of resistance of bacteria and embryonic tissue to I merthiolate 46
- substances comparison of the resistance of bacteria and embryonic tissue to II metaphen 96
- substances III mercurochrome comparison of resistance of bacteria and embryonic tissue 153
- substances IV hexylresorcinol comparison of resistance of bacteria and embryonic tissue 153
- Givofen 41
- Givonal 41
- Glass color of used to protect from light 323
- electrode measurements with the 274
- wool decomposition of hydrogen peroxide in presence of and copper sulphate 274
- Glucides experimental investigations on vitamins B in their relations to proteins and lipids of diet 60
- Glucose production of fat from by molds cultivation of *Penicillium javanicum* van Beijma in large scale laboratory apparatus 50
- simple method for determination of in urine 164
- Glucosides of Digitalis purpurea 51
- Glucostrophin 145
- Glutamiron 145
- Glutathione mechanism of the antidote action of 342
- Glycerin regeneration of in production of glycerophosphates 56
- Glycerinum thymolis rubrum A P F notes on coloring of 134
- Glycerol determination of in the presence of sugars by means of periodic acid 122
- mixed esters of with aliphatic acids and phosphoric acid 111
- Glycerophosphates regeneration of glycerin in production of 56
- Glyceril trimitate tablets assay of 304 305
- Glycol water mixtures relation of vapor pressure and boiling point to the composition of 3
- Glycols some properties of with special reference to the use of propylene glycol as a solvent in pharmaceutical preparations 323
- Glycyrrhizin 161 210
- Glykhepar 199
- Goebin 145
- Gold microchemical determination of in the presence of palladium and tin 305
- salts use of in treatment of pulmonary tuberculosis 348
- salts value of in disseminated sclerosis 91
- sol preparation of for liquid analysis 305
- therapy agranulocytosis with purpura haemorrhagica following 341
- therapy prevention and treatment of harmful effects of 342
- toxicity of injections of 88
- Gonacrine ampuls 358
- Gonad stimulating product 163
- Gonadotropic factors interrelationships among urinary pituitary and placental 58
- hormone an improved method for determination of the 187
- hormones 114
- hormones hypophyseal 58
- Gonadotrophic principles occurrence of and estrogenic principles in myoma of uterus 7
- Gon A Vee 16 261
- Gonococcus filtrate corbus ferry 145
- filtrate experience with in treatment of gonorrhea 2
- vaccine use of in acute gonorrhea 348
- Gonorrhea experience with gonococcus filtrate in treatment of 2
- recent progress in the treatment of in children 35
- Gossypol effect of on color of cottonseed oil 280
- Graduates inaccuracy of glass 12
- Grease paints 234
- Grindelia robusta Nutt histologic study of 70
- Grumonal 358
- Gum ammoniac content of umbelliferone in Persian 129
- Gynergeen 41
- Gynergen 145
- Gynichtol 358
- Gynocalcum M 281
- P 261
- H
- Haemodan 37
- Hai jen tsao (Digena Simplex Ag) chemical study of 210
- Hair dyes manufacture of 234
- lotion 178 234
- tonics 178
- Halibut liver oil 5
- liver oil preservation of with hydroquinone 209

- liver oils characters of 281
 Iliacaps 145
 Halides method for the colorimetric determination of small quantities of iodide in the presence of other 13
 volumetric determinations of use of dichloro fluorescein as an adsorption indicator 220
 Halmagon 145
 Halogens solubility of in heptane 286
 Hamamelis (witch hazel) extract and distillate history of 80
 Hansen bacillus direct action of methylene blue on 91
 Harmalol nitro and amino derivatives of O alkyl ethers of and harmol 101
 Harmine and Harmaline II nitro and amino derivatives of O alkyl ethers of harmol and harmalol 101
 Harmol nitro and amino derivatives of O alkyl ethers of and harmalol 101
 Hawthorn Fruit oil of 106
 Heart lesions therapeutics of non decompensated 194
 Heavy water research on the content of in mineral waters 274
 Hederyl 358
 Hebiten 146
 Hematomorphyrine use of as a therapeutic agent in psychosis 348
 Hemolytic streptococci in erysipelas 153
 Henna evaluation of 13
 Hepastab 358
 Hepatopson forte 358
 Hepatose 358
 Hepatard ampuls 146
 liquid sweetened 146
 Heptane and its solutions chemistry of 286
 Heroic drugs maxima doses of galeical preparations of 348
 Heroin micro detection of 305
 Heroin comparative study of analgesia produced in normal subjects by morphine codeine and dilauid 245
 Herpes virus attempts to produce immunity with large quantities of killed 97
 Hexa-chloride compound 261
 Hexamethylenetetramine determination of and its decomposition in dilute aqueous solutions 220
 determination of in its anhydromethylene citrate 123
 production of medicinal from technical product 112
 Hexylresorcinol comparison of resistance of bacteria and embryonic tissue to 153
 cystoids 261
 Histamine injection 237
 Histidine monohydrochloride value of in the treatment of peptic ulcer 349
 History value of in drug store 26
 Holarrhena antidysenterica a new alkaloid from the bark of 207
 Homatropine detection of 13
 Homeopathic dispensatory new methods of preparation and assay of 178
 pharmacopoeia German 24
 pharmacy basic demands of 136
 pharmacy in 1934 136
 preparations VI evaluation of saponin containing tinctures 123
 Homeopathic pharmacy regarding the progress of 323
 Homeopathy 136
 history of 238
 Homogenizer hand type and its use in making emulsions 132
 Honeysuckle investigation of some species of 283
 Hormone and vitamin cosmetic creams 328
 Hormones endocrinology 114
 and lipoids separation of 114
 from urine 290
 in pregnancy urine investigation of the new biologic test for 290
 Hormonal supra 234
 Hormotone 358
 Horosteon 42
 Hospital dispensary methods 237
 pharmacists of Amsterdam modification in in structure and salary revision of in 1857 80
 pharmacy practice innovation in 26
 Hovaletten forte 146
 H pertussis phases or types of 271
 Hucomin tablets 199
 Humaven 200
 Humoral medicine and chemistry 290
 Humors chlorine content of, after death 224
 Hydrangea paniculata on the constituents of and on hydrangin 284
 Hydrocarbon occurrence of unsaturated in olive oil 5
 Hydrochloric acid determination of in stomach contents 290
 acid use of in tonsillitis 36
 Hydrocinehomidine toxicity of in guinea pig 87
 Hydrocyprene ethers value of in pneumonia 85
 Hydrocyanic acid antidotes of and more particularly the mechanism of the antidote action of glutathione 342
 acid determination of in plants 123
 acid preservation of cherry laurel water and solution of by paraffin oil and vaseline 71
 acid preservation of solution of by paraffin oil and official vaseline 227
 acid toxicology of 224
 Hydrogen heavy 3
 precipitant for the microanalytic determination of 299
 peroxide 156
 peroxide decomposition of in presence of glass wool and copper sulphate 274
 peroxide stabilization of especially by acetanilid 174
 peroxide solution stability of 323
 sulphide quantitative estimates of in lotions used in treatment of acne 13
 sulphide value of sodium nitrite as antidote to 89
 Hydronal 94 146 261
 Hydroquinidine toxicity of in guinea pig 87
 Hydroxybiphenyls chlorinated and brominated 55
 Hyoseyamine detection of 13
 Hypnotic poisoning acute treatment of 342
 Hypnotics and sedatives 246
 Hypochlorite solutions determination of available chlorine in by direct titration with sodium thiosulphate 13
 Hypophosphites determination of 13
 Hypophyseal gonadotropic hormones 58
 Hypotan 359
 Hypotensive hormone cause of protein shock 194
 Hyptis mutabilis volatile oil of 161
 Hyspop a survey of production and characteristics of 278

I

- Identification numbers of drugs and galeicals V
 copper numbers of drugs used most 65
 Idracafin 200
 Idracafine 261
 Idragine 261
 Igeneu 200
 I mao tsao composition of purple flowered 162
 Immunity relative importance of reticuloendothelial tissues and circulating antibody 46
 Immunizing preparations 271
 Incompatibilities ionic reactions as the cause of 25
 Ineritone 359
 Indigo detection of methyl ketones by conversion to 170
 Indigocarmine use of in microvolumetric analysis 305
 Indole bacteriostatic action of on gram negative enteric bacilli and on certain cocci 271
 series studies in 102
 Indophenine reaction application of the for the identification of some organic polyacids 305
 reaction use of for the identification of some organic polyacids 65
 Indoxyl content determination of of urine and blood serum 292
 Inextractable liver extract Abbott 281
 of Bismuth B P note on the sterilization of 153
 Injections hydrogen ion concentration in 124
 Inolene 200
 Insecticides and fungicides 154
 Insulin blood sugar curves in normal and diabetic dogs after intravenous injections of 139
 irradiated stimulation of the adrenal medulla by 139
 new method for precipitation of 164
 purification of method for precipitation of 115
 quantitative determination of in fluids tissues etc 29
 preparations evaluation of 86
 rapid method for the determination of purity of commercial *in vitro* 221
 standardization of preparations of 29
 sulphur in 291
 treatment of menorrhagia and metrorrhagia 349
 value of in toxic diphtheria 91

- Intoxication by *Sabina* two cases of 342
 Iodaseptine 261
 Iodeoprine 200
 Iodide method for the colorimetric determination of small quantities of in presence of other halides 13
 ion microchemical investigation of 124
 Iodine antiseptic power of certain solutions of 228
 colloidal use of in medicines and cosmetics 91
 content of in cod liver oil 50
 determination of in plant material, 13
 stability of solutions of 221
 number rapid method for the determination of 167
 ointment non staining 228
 Iodoform and thymol iodide preparation and properties of 286
 β Iodoxyhydroxynaphthalenedisulphonic acids 50
 Iodopentone cody 200
 Iodotannic syrup phosphated antirachitic action of, 86
 Iod tetragnot powder 42
 Iod Turpial 359
 Ioscol 202
 Ipecac brief study of 349
 alkaloids distribution of in the rubiace 207
 contribution to the knowledge of the extraction of 72
 root localization of the alkaloids in 158
 Iris versicolor, L. methods of identification of rhizomes of and *Iris virginica* L. 21
Virginia L. methods of identification of rhizomes of and *Iris versicolor* L. 21
 Iron cerimetric titration of small amounts of by means of α -dipyridyl as indicator 305
 colorimetric micro and submicro method for the determination of 201
 determination of in mardulcan 168
 determination of metallic in presence of iron oxides reduced iron 167
 estimation of zinc in presence of 316
 micro and submicro colorimetric determination of 221
 oxides determination of metallic iron in presence of reduced iron 167
 reduced evaluation of by the sublimate method 12
 reduced note on the assay of 14
 Iscapral 146
 Isobutyl groups introduction of into phenols cresols and homologous compounds 7
 Isomannide Fate of in the animal body 244
 Isomerism in polyalkylphenols 27
 Isopropyl nitrate note on 286
 Isopor tablets 354
 Ispaghula structure and histology of seeds of *Plantago ovata* Forsk. 225
- J
- Jalap effect of variation in solvents on the extraction of 321
 Japanese mint oil detection of in peppermint oils 223
 mint oil detection of in peppermint oils 311
 Jectovin 262
 Jocapral 146
Juniperus occidentalis 278
- K
- Kaolin emulsifying and suspending power of an extra colloidal kaolin blanc extra colloidal suspensiv 229
 pharmaceutical 157
 Karkade 318
 Katadyn-Silver 200
 Kataline 95 262
 Katemenol-dragees 146
 Kessoval 42
 Kitano 359
 KLX 262
 Koch's phenomenon the production of with various strains of tubercle bacilli 271
 Koemis Koetjing clinical investigations of a new preparation from the Indian kidney tea 195
 Kola Jamaica and Madagascar 70
 nut cultivated in Brazil 207
 Kolag 262
 Kollargol identification of 121
 Kuprophane as dialysis membrane 218
 Kurabo 359
 Kynerval 359
- L
- Labiatae tannin content of 21
 tannins in 283
 Lac constitution of 112
 Laccodermes 359
 Lactic acid determination of 306
 acid physical characters of in course of aging 56
 ferments determination of biologic value of 65
 Lacto-flavin (vitamin B) isolation of from hay 58
 Ravins optical activity of 65
 Lactometer new type reading total solids 221
 Lactozym Alfa 262
 Lanadign digitoxin and ouabain cumulative poisoning by 243
 Lanogeen 95
 Lanolin immunizing activity of tetanus toxin in 98
 and its uses 235
 Lapine levorenine (adrenaline) 207
 Iard estimation of the water content of 124
 identification of in pharmaceutical preparations 124
 Larostidin 95
 Larostin 146
 Laurus camphora maximum yield of camphor obtained from 155
 Laws and orders regarding pharmacy in 1934 238
 Lavatives 42
 Lead biochemical behavior of in body 31
 control of poisoning by in workers 32
 determination of in drinking waters 167
 electrolytic colorimetric method for the micro determination of 14
 epidemiology of poisoning by 32
 normal absorption and excretion of 31
 quantitative spectrographic determination of in urine 14
 poisoning detection of 131
 Leaf oils of the Washington Conifers VII *Juniperus occidentalis* 278
 xanthophyll analysis of and betacarotene in their teen plant tissues 10
 Leaves 205
 Lebergranulat 359
 Lecminz 146
Leacthia vegetable antioxidant properties of 53
Leacthus use of in nutrition etc 115
 Lectrapp 359
 Legislation food and drug 26
 Leonurus cardiaca 132
 Leulichthol 42 359
 Levorenine (adrenaline) 207
 Lidrosan 42
 Lignin presence of in leaves a2
 Lime and bleaching powder presence of manganese in commercial 168
 Lime liniment of the Belgian Pharmacopœia 214
 Linimentum ribbeck 359
 Lip stick 76
 sticks chemistry of 76
 Lipids experimental investigations on vitamins B in their relations to glucides proteins and of diet 60
 Lipidol use of as a therapeutic agent 349
 Lipoid determination of total in plant and animal tissues 14
 Lipoids and hormones separation of 114
 Liquid preparations scheme for the identification of the simple of the British Pharmacopœia 125
 shampoo 328
 Liquorice root report on from Cyprus 21
 Litin salve 359
 Liver anti anemia potency of after gastrectomy in swine 86
 and stomach preparations assay of 338
 effect of autolysis on potency of in treatment of pernicious anemia 115
 extract charcoal adsorption as a method for the preparation of concentrated 115
 extract preparation of 115
 extracts 325
 extracts characteristics and therapeutic use of treatment of anemias of bacillary origin 194
 preparations use of pigeons in the assay of 187
 Livron 262
 Lloyd's reagent adsorption of strychnine sulphate by various charcoals and by 49
 Local anesthetics relation of pH and surface tension to activity of 243
 Lorisin 359
 Lotions quantitative estimates of hydrogen sulphide in used in treatment of acne 13
 I P C proderma soap 359
 Lubrokal clinical investigation of 194
 Ludozan 146
 Luemed Tablets, 147
 Lugol's solution 176
 Lumilactoflavin natural and synthetic 99

- Luminescence analysis advances in, 168
 Lupulin value of fresh 108
 Luteal ampuls 262 359
 Luteal hormone 59
 hormone biological study and testing of 243
 Luteohormone and oestrin, 8
 Luteolipex 359
 Lutreen 95
 Lysal 200
 Lymphatic leukaemia treatment of, 104
 Lysates 349
- M
- Madagascar clove oil survey of primary production of 209
 Maggamon asthma powder 262
 Magnesium carbonate analysis of 66
 and aluminum microchemical detection of with alkannin and naphthazarin 108
 hydroxyde cleaning cream containing 233
 oxide incompatibility of with sodium bicarbonate 180
 perchlorate value of as drying agent 3
 salts comparative studies on the utilization of different 187
 Maimonides medical works of and his treatise on personal hygiene and dietetics 26
 Malaria chemotherapy of 349
 use of bismuth violet in and for chancreoids 34
 Male Fern rhizome and extract of 188
 hormone biological estimation of upon the hard head 244
 sex hormone biological evaluation of the 338
 sex hormone extraction of from urine 7
 Maltine with spleenmarrow and iron 147
 Mandelic acid value of in urinary infections 194
 Manganese estimation of copper and its separation from cadmium nickel cobalt etc 126
 estimation of zinc and its separation from 127
 presence of in commercial lime and bleaching powder 168
 Manure preparations modern 133
 Mannide and isomannide fate of, in the animal body 244
 Map 360
 Maple syrup *aërobacter aerogenes* as cause of ropiness in 52
 Marulcan determination of iron in 168
 Marshmallow root acidity of and presence of calcium soluble in acetic acid 108
 Mastal ampuls 262
 Mastal liquid 262 360
 Maté tannin in 52
 Mathematics pharmaceutical some observations after twenty five years experience in teaching 80
 Matricaria Italian and Hungarian 205
 Measles serum use of convalescent to control measles in preparatory school, 154
 Meat extract suggested test for distinguishing between and yeast extract 14
 Mebaral 42
 Meconic acid colorimetric determination of in opium by means of gradual photometer 125
 Medical products Tollen's reaction in analysis of 66
 Medicinal agents standardization of III particle size and degree of dispersion of important medicinal agents 125
 chemistry contributions of 205
 mixtures thermo analysis and eutectics of 306
 products study of the alteration of by pH determinations 168
 Medicines for injection physiological and physico-chemical considerations in the preparation of 332
 Medulka frostbite ointment 360
 Megsaly 360
 Meningococcus antitoxin Ferry's 97
 cultures viability and virulence of frozen and dried 164
 Menotheosan dragees 360
 Menthone determination of in oil of peppermint 310
 Mercollid ampuls 360
 Mercural antiseptics action of on muscle oxydase 188
 diuretics reaction at site of injection of as influenced by theophylline 250
 ointments determination of mercury in 15
 Mercurials some organic 154
 Mercurochrome comparison of resistance of bacteria and embryonic tissue to 153
 determination of mercury content of 306
 Mercury determination of content of in mercuriochrome 306
 bichloride treatment of poisoning by, 88
 compounds study of germicidal and antiseptic activity of some 163
 determination of, in mercurial ointments 15
 new method for dry purification of 205
 pill B P 1932, note on 237
 poisoning use of sodium formaldehyde sulfoxylate in 192
 Merphenyl, 262
 Merthiolate comparison of resistance of bacteria and embryonic tissue to, 40
 comparison of value of and phenol as preservatives for diphtheria toxoids 96
 Mescaline, distribution of in different parts of central nervous system and their quantitative microdetermination in tissues 241
 Mesothorium and radium use of in treatment of non-malignant hemorrhage 350
 Metal heavy a new stabilized antidote for poisoning by 340
 Metamucil 262
 Metaphen comparison of the resistance of bacteria and embryonic tissue to 96
 Methanol methods for detection and determination of in natural media and liquids 125
 new method for the determination of small quantities of in presence of very large quantities of ethanol and its homologues 306
 presence of in essential oils and their ethanol solutions 303
 Methemoglobin 250
 importance of fluorinated in the determination of fluorine in industrial hygiene 224
 Methyl alcohol determination of in alcoholic products 307
 chloride poisoning 89
 ketones detection of by conversion to indigo 170
 salicylate determination of according to D A B VI 221
 Methylamino methyl heptene pharmacological action of 244
 Methylene blue direct action of on Hansen bacillus 91
 blue injection 237
 blue intravenous use of in the treatment of cyanide and carbon monoxide poisoning 36
 blue methemoglobin and cyanide poisoning 250
 blue photodynamic effect of on tetanus toxin 98
 blue therapeutic use of in phenol poisoning 89
 blue treatment of wound diphtheria by 194
 Metircure 200
 Microburette new with removable tip 307
 Microchemical laboratory technique improvements in 307
 Microchemistry rôle of in pharmacopoeias 25
 Micro-copper pyridine reaction, application of to some organic acids 222
 Microdistillation apparatus for 307
 Microdometric determinations 307
 Micropolarographic investigations 308
 Microscopic mounts permanent aqueous 318
 objects new method for picking out of water 125
 Microsechum helleri tand (*pseudosechum rand*) constituent of 283
 Microshaker useful in microtitrations 308
 Microsublimation is it useful in the investigation of powdered drug mixtures? 308
 as a pharmacopoeial test 222
 Milk determination of copper in 219
 Milks biological equilibrium and disequilibrium of commercially modified 291
 Mineral oils contribution to the study of official 308
 pigments systematic method for the identification of II blue and green pigments 308
 pigments systematic method for microchemical identification of 125
 Mineralal 263
 Mingol extra 200
 Miosal ampuls 263
 liquid 263
 Mistol 42
 Mixtures determination of santonin in 17
 determination of tetrachlorethylene in 18
 Mold fermentations apparatus for the application of submerged under pressure 204
 Molds production of fat from glucose by cultivation of *Penicillium javanicum* van Beijma in large scale laboratory apparatus 50
 Monarda fistulosa sterols from phytochemical notes no 111 108
 Monosaccharides microchemical detection of 66
 Morphine action of as a metabolic stimulant 244

- codeine and dilaudid comparison of motor effects of on Thierry fistula 188
- codeine heroine and dilaudid comparative study of analgesia produced in normal subjects by 245
- colorimetric assay of 308
- colorimetric microdeterminations of in opium and its preparations tincture of laudanum and syrup of morphine hydrochloride 108
- colorimetric microdetermination of in opium its preparations and in morphine syrup 66
- comparative study of actions of and dilaudid (di hydromorphinone hydrochloride) on intact small intestine of dog 30
- determination of in tincture and extract of opium 308
- effect of on human ureter 188
- estimation of in opium 169
- habituation withdrawal cure with quinine 350
- international method for its determination in opium 126
- micromethod of determination of in opium preparations 309
- new colorimetric method for determining and its derivatives 15
- new method for determination of especially in opium 66
- reaction for in papaverine hydrochloride 169
- respiratory effects of codeine and related substances III effect of morphine dihydromorphine dihydromorphinone (dilaudid) and dihydrocodeinone (di codid) on respiratory activity of rabbit 30
- series reduction studies in V dihydro- and tetra hydro pseudocodeine methyl esters 3
- series reduction studies in VI hydrogenation of alpha and beta isomorphines 3
- solubility of in different solvents 102
- syrup colorimetric microdetermination of morphine in opium morphine preparations and in 66
- Moru Quin 42
- Mouth wash powders 179 230
- Mucidan cough drops 263
- Mucitekt tablets 200
- Mugantheme 360
- Mushrooms essential oil from 104
- Musks natural 71
- Mussel poison chemistry and toxicity of 32
- Myrrh from Kenya 318
- Myrrhatan 200
- Myrtazeenol reincke 360
- N
- Naftalan 42
- Nail polishes and enamels 133
- Náncatl delerium fungus (*Amanita Mexicana*) 108
- Naphthazarin microchemical detection of magnesium and aluminum with alkannin and 168
- Narcotics detection of in sense of opium law 67
- Natrico pulvions 263
- Natraphene 354
- Neda hair tonic clinical 263
- Neiso Lysate 147
- Nembutal 360
- effect of upon serum cholesterol of dogs 188
- Nemural 201
- Neosarphenamine influence of ascorbic acid on sensitization of guinea pigs to 84
- influence of vitamin C on development of skin sensitivity to in guinea pig 88
- Neogel acidulans 201
- autifluoric 201
- antagonorrhoic 201
- resorbens 201
- Neonal sodium 354
- Neo-Oleosal 42
- psicobenyl 42
- trepol 263
- Nerosol 360
- Nervanon 360
- Neurobrom 201
- New drugs and their standards 81
- New remedies 147
- Nickel estimation of copper and its separation from cadmium manganese cobalt etc 126
- Nicotiana rustica harvesting time for 156
- Nicotine contribution to pharmacology of 240
- microchemical detection of 317
- nephelometric determination of small quantities of 309
- Nicotyrine presence of in tobacco 102
- Nirvanol treatment of chorea with 36
- Nitric acid destruction of organic matter in plant material by the use of and perchloric acid 222
- Nitrites determination of in tablets 15
- Nitro compounds toxicity of 89
- Nitrodan 42
- Nitrogen simple method for the determination of 126
- volumetric determination of residual without distillation 310
- Nitroglycerin tablets influence of method of preparation of on nitroglycerin content 73
- Noctusan 150
- Noircalpoeder 360
- Noircaltablettan 360
- Novalgin quinine 300
- Novocaine reactions of solutions of on sterilization and storage 48
- special detection of and cocaine with reference to smuggled goods 8
- Vovophyllin clinical experience with 195
- Nupercainal 263
- Nutritive value of foods action of some commercial practices on 292
- Nylander test simple and rapid procedure for 67
- Nymphosan Peru gummibonbons 361
- O
- Ocimum canum production of camphor from 160
- Ocimum use of in smooth muscle spasm 350
- suppositories 150
- Oestrin treatment of vulvo vaginitis with 91
- and luteohormone 8
- Oil of citronella 279
- of hypericum examination of 310
- of myrtle survey of 279
- of peppermint determination of 310
- of peppermint determination of menthone in 310
- of turpentine detection of pine oil in 310
- peppermint report on from cyprus 4
- Oils essential estimation of alcohols in 64
- and waxes acid indices of the official 214
- of flaccourtiaceae actual situation of production of in view of their utilization in therapeutics 49
- note on sterilization of 155
- spoilage of and fats III rancidity and constitution of oleic and elaidic acids 50
- sterilization by dry heat at 150° C with special reference to 155
- Ointment jars bakelite 180
- making 229
- of mercuric nitrate strong assay of 169
- Ointments determination of reasonable or permissible margin of error in 79
- and similar preparations qualitative examination of by means of filtered ultraviolet light 126
- eye 79
- preparation of dihydroxypropyl esters of fatty acids and use in emulsions and 106
- structure of 175
- Olxain ointment 263
- Oleic acid rancidity and constitution of and elaidic acid 50
- Oholase 263
- Olive oil occurrence of unsaturated hydrocarbon in 5
- oil and zinc oxide mixtures of 181
- oils fluorescence of influence of pigments 126
- oils study of use of Belier number for the detection of peanut oil in 297
- Ophthalmic therapeutics 91
- Opium administration of to infants in India 360
- colorimetric determination of meconic acid in by means of gradual photometer 125
- colorimetric microdetermination of morphine in 168
- colorimetric microdetermination of morphine in morphine preparations and morphine syrup 66
- comparison of proposed methods 222
- concentrated D A B VI preparation of in the drug store and critical evaluation of the D A B VI method of preparation and assay 311
- estimation of morphine in 169
- international method for determination of morphine in 126
- Jugoslavian 226
- new method for determination of morphine especially in 66
- Optolax tablets 201
- Orange juice browning of 23
- Orgabroom 263
- Organic acids assay methods for salts of 17
- arsenic compounds 56
- compounds detection of by means of spot reactions IX. (1) detection of acetic acid by formation of indigo (2) detection of methyl ketones by conversion to indigo dyes 170

- matter in plant material destruction of by the use of
 nitric and perchloric acids 222
 solvents modern 131
 Orbanche Ramona L. 226
 Ortho aminophenol acyl derivatives of 163
 n alkylphenols anthelmintic studies on 27
 Orthophosphoric acid migration phenomena in the
 course of hydrolysis of the three mixed di esters
 275
 Orthosichol clinical investigations of a new prepara-
 tion from Koemis koetjing the Indian kidney tea
 195
 Osol 263
 Otalgan, 263
 Ouabain, cumulative poisoning by 243
 Ovaria siccata 264
 Ovarian follicular hormone crystalline, 114
 Oxalates availability of calcium in foods containing
 289
 Oxidase detection of in mucilage of acacia 13
 Oxyascarin tablets 361
 Oxybenzoic acid esters researches with for sterilization
 of eye drops 271
 Oxykin cream 361
 Oysters food value and anti anemic power of 139
- P
- Palladium microchemical determination of gold in the
 presence of 305
 Pallida Antigen 361
 Palma oils composition of commercial IV progressive
 hydrogenation as an aid in the study of glyceride
 structure 106
 Pancreas dispers 42
 Pancreatin determination of amylolytic activity of 15
 Pandigal 201
 Pankresaletten 150
 P an shia chemical composition of 158
 Panteric tablets 264
 Pantigal plugs 361
 Papaverine hydrochloride reaction for morphine in 169
 hydrochloride solubility of in presence of certain
 salts 180
 Para n alkylphenols anthelmintic studies on 27
 Paradies Salbe 150
 Paraffin oil preservation of cherry laurel water and
 solution of hydrocyanic acid by and vaseline 71
 wax tensile strength and density at various tem-
 peratures 222
 Paralaet tablets 361
 Paraldehyde advantages of as basic amnesic agent in
 obstetrics 36
 Parasympathetic drugs intestinal motor inhibition by
 86
 Parathyroid hormone use of rabbits in the standardiza-
 tion of 245
 tetany, treatment of 92
 Parnarium laurinum the highly unsaturated acid of
 the kernels of 281
 macrophyllum the highly unsaturated acid of the
 kernels of 281
 Paspal 361
 Passiflorine, 76
 Patchouli oil of the seychelles 161
 Patent medicines 80
 Pathogenic fungi effect of dyes on colonies of certain
 46
 fungi scalp products and hair of men and women
 as culture media for certain 46
 Paverysatum Bürger 150
 Peanut oil study of use of Belier number for the
 detection of in olive oils 297
 Pectins survey of recent researches on 5
 Pelargon 361
 Peltitol 264
 Pelose 95
 Penetal, 201
 Penicillium charlesii molecular constitution of meta-
 bolic acids of 56
 Pentazol 43
 Pentnucleotide 150
 Pentobarbital chloral hydrate and avertin relative
 efficacy of a series of anaesthetics as antidotes to
 sublethal and lethal doses of 338
 Pep-acid tabletten 361
 Peppermint oil from black mint cultivated in southern
 Sweden 161
 oil of an unusual 279
 oil report on from Cyprus 4
 oils detection of Japanese mint oil in 223 311
 Pepsin action of especially in pepsin wine 311
 assay processes and stability of commercial, 170
 determination of proteolytic activity of 16
 wine action of pepsin in 311
 Perborat Noury, 361
 Percanall 264
 Perchlorates determination of, 15
 Perchloric acid, destruction of organic matter in
 plant material by the use of nitric acid and 222
 Peremesin, 361
 Perfume chemistry new procedures in 209
 Perfumes synthesis of preparation of methylene ester
 of pyrocatechol 112
 Perinkret 361
 Periodic acid determination of glycerol in the presence
 of sugars by means of 122
 acid preparation of and trisodium periodate 112
 Per iodotheodural 95
 Peristaltine 264
 Peritonitis prophylactic for 36
 Per joodtheodural 264
 Pernicious anemia effect of autolysis on potency of
 liver in treatment of 115
 anemia liver and drug therapy in 195
 Pernoxon value of in basal narcosis 195
 Peroxan 180
 Peroxide reaction for in ether 122
 Persica vulgaris (peach tree) and persicoside study of
 283
 Persicoside study of 283
 Pertugen ointment 361
 Pertussin drops 43
 Pertussin troches 361
 Pertussis vaccine (Sauer) 264
 Pervical 362
 Petroleum products viscosity of 15
 Peyote alkaloids of 276
 pH conception value and measurement of 311
 determinations study of the alteration of medicinal
 products by 168
 pharmaceutical study of 175 229
 Pharmaceutical and phytochemical products direc-
 tions for the preparation of 285
 formularies and the Belgian National Formulary
 233
 machinery 23
 mathematics some observations after twenty five
 years experience in teaching 80
 research application of statistical methods to IV
 methods of recording drug action 338
 specialties necessity of controlling 27
 Pharmacist education of the 334
 and the podiatrist 335
 Pharmacodynamics and toxicology of bismuth bismuth
 poisoning 341
 Pharmacognosists of nineteenth century eminent
 American 80
 Pharmacognosy teaching of habitats in 181
 Pharmacognosy syllabuses British and American com-
 pared 226
 Pharmacological and toxicological viewpoints in
 cosmetology 188
 Pharmacopoeia Belgian IV some remarks on 24
 homeopathic German 24
 London hospital 25
 of the U S and the Federal Food and Drugs Act
 334
 Pharmacopoeial tests notes on some 170
 questions from practitioners 233
 Pharmacopoeias, rôle of microchemistry in 25
 the oldest of Switzerland 233
 Pharmacy history of in the Netherlands 26
 and academic standards, theory of 81
 at the beginning of the 19th century 238
 in Denmark 335
 Pharyngil 362
 Phenacetin, effects of and aspirin respectively upon
 action of phenobarbital 245
 and salol fusion curves of 98
 Phenandryne 264
 Phenobarbital effects of phenacetin and aspirin re-
 spectively upon action of 245
 Phenochan salve 160
 Phenol companion of value of and merthiolate as
 preservatives for diptheria toxoids 96
 dermatitis due to 89
 partition of between olive oil and serum in ascitic
 fluid 164
 therapeutic use of methylene blue in poisoning by
 89
 Phenolphthalein accidental overdose of in a child
 without ill effects 32
 irreversible fading of 223
 reactions caused by 251

- Phenols introduction of isobutyl groups into cresols and homologous compounds 7
molecular compounds of 7
Phenyl aspidrine 364
Phenylethylbarbituric acid solubility of, in ether 311
Phenylmercuric nitrate treatment of chronic vaginitis with 36
N Phenyl piperazine, derivatives of 286
Phenyl procaine, local anesthetics 150
2 Phenylquinoline 4 carboxylic acid quinine salt of 207
Phenylal 43
Phlorin 43
Phos Cal 264
Phosform drops 362
Phosphated iodotannic syrup antirachitic action of 80
Phosphatide preparations 53
Phosphorus peculiar action of in treatment of rickets 86
determinations rapid method of preparing biological materials for 67
Photochemical notes no 113 an unusual peppermint oil 279
Photodyn 43
Physormon Schnupf powder 362
Physostigmine (eserine) complete synthesis of 102
(eserine) experiments on the synthesis of part XI 276
synthesis of 208
Phytine 264
Phytochemical notes no 108 a phytochemical study of the seed of the digger pine, 284
notes no 112 preliminary chemical examination of *Corydalis aurea* 53
Picochrome new urinary antiseptic 33
Picric and tannic acid in burns 352
Picrotoxin part I 287
preparation of 162
Pigeons use of in the assay of liver preparations 187
Pigments the growth promoting and growth arresting action of on plants 156
Pigofusin 362
Pill masses 237
Pills adsorptive properties of substances used in the preparation of 230
use of cocoa butter as excipient in containing extracts 132
Pineal extracts biological effects of active 88
Pinus sabiniana sterol from phytochemical notes no 113 109
Piqui A fats component glycerides of 161
Pituitary anterior clinical manifestations of dysfunction of 57
anterior general physiology of 57
chromatophoretic principles of pars intermedia of 60
diabetogenic thyrotropic and parathyrotropic factors of 116
extract hypersensitiveness to 245
gonadotropic factors interrelationships among urinary and placental 58
lactogenic factor of, 60
posterior 60
separation of anterior thyrotropic hormone of 50
Placenta serum preparation of anti measles 97
Placental gonadotropic factors interrelationships among urinary pituitary and 58
Plant tissues determination of total lipid in and animal tissues 14
Plantago botanical sources of drugs derived from the genus 173
Plants the growth promoting and growth arresting action of pigments on 156
toxic chemical problems connected with the study of 285
ultrafiltration and its application to the extraction of the active principles of 230
Plasma fibrin new method of determining 60
Plastisol 285
Platinum metals microscopic identification of 311
Pleuro pneumonia contagiosa boum study of the morphology and life cycles of 272
Plumbism recent progress in the treatment of 32
symptoms in early stages of industrial 32
Pneumococci application of the Neufeld reaction to the identification of types of 97
use of sodium desoxycholate for identification of, 2
Pneumococcus antigenic characteristics in man of certain products of the 97
oral immunization of human beings against 2
solubility of in saponin 272
Pneumostagnine 43
Podiatrist and the pharmacist 335
Podophyllum determination of 15
Poison cases, concerning important 89
Poisoning control of by lead in workers 32
by somnifen 32
Poisonings common in general practice 140
native in the Dutch Indies 89
Poison oak dermatitis use of ferric chloride in, 35
Polarization in the Apothecaries Laboratory 312
Poliomyelitis active immunization against 46
active immunization against with germicidally inactive virus 46
convalescent serum in 154
Polyacids organic use of indophenine reaction for the identification of some 65
Polyalkylphenols isomerism in 27
Polymalan 362
Polypodineæ of pharmaceutical interest anatomical investigation of the leaves of 156
Poly propetan dragees 201
Ponine 43
Porner blue use of as indicator 117
Postalan hemorrhoidal ointment 265
hemorrhoidal suppositories 201
Posterior pituitary 60
Potassium bismuth tartrate oral administration of in syphilis 195
bromate note on standard solutions of 312
chlorate and sodium chlorate determination of chlorate in 312
chloride effect of large doses of masthemia gravis 350
dichromate standardization of 15
ferrocyanide employment of in standardization of dilute potassium permanganate 68
ferrocyanide toxicologic study of as a clarifier for white wines 171
guanacol sulphate 287
iodide assay process for 16
ion detection of with gardinol W 126
ions volumetric microdetermination of 218
permanganate electrolytic manufacture of 48
permanganate employment of potassium ferrocyamide in standardization of dilute 68
salts diuretic action of 246
stannic pyrocatecholsulphonate and other complex metal compounds 56
stannous chloride use of in the volumetric determination of copper 120
Pregnancy diagnosis 164
Prescription compounding 81
departments note on open 82
Preservatives notes on some new used in pharmacy 154
Prunella root 53
Procaine separation and detection of cocaine in mixtures of cocaine and 301
Proctodes 265
Procythol forte ampuls 43
Professional outlook 82
pharmacy and chemical pharmaceutical industry in the Soviet Union state of impressions from a tour, 335
Profit the way out of the depression 136
Progesterin crystalline inhibition of uterine motility with *in vivo* 339
Progravid 265
Prokliman 265
Proliferol 150
Prolinal 265
Prominalettes use of as sedative 195
Prontosil 93 142
bactericidal value of 154
use of in puerperal fever 195
use of in streptococcal infections 195
Prophylactic kit 362
Propylasmin Hautsalbe 150
" Propylarsonic acid use of as a reagent for the determination of zirconium 16
Propylene glycol some properties of glycols with special reference to the use of as a solvent in pharmaceutical preparations 323
glycol use of as a solvent 230
Prostagma 264
Protargol argyrol collargol electrargol reactions for the differentiation of 296
identification of 121
researches on the modification of the physicochemical properties of with the length of time of its preservation 227
Proteins experimental investigations on vitamins B in their relations to glucides and lipids of diet 60
Proteolytic activity determination of of pepsin 15
enzyme content of in latex from the fig tree (*Ficus carica* L.), 107

- enzyme in the latex from the fig tree (*Picus glabrata*), 107
- Protopine and allied alkaloids synthetic experiments on part II, 276
- Provenase mudy, 362
- Providoform use of, in skin disinfection 350
- Proviron 95, 265
- Prusenilla powder 362
- Psittacosis recent studies on 154
- virus growth and development of in tissue cultures 155
- Psoriasis value of psormangan in and ichthyosis 36
- Psormangan value of in psoriasis and ichthyosis 36
- weil 43
- Psorimed 150
- Psyllium seed further studies on 70
- Pterocarpin identification of constituents of red sandal wood 6
- Publicity furthering pharmaceutical 82
- Pudan head and foot powder 362
- Puerperalfeber - serum (concentrated streptococcus serum) 362
- Puerpal fever serum 265
- Pukateine pharmacological action of 246
- Pumpkin seeds anthelmintic action of 188
- Purine preparations cobalt nitrate as a reagent for pharmaceutical 171
- Purosan 362
- Pyorrhea powder for treatment of 350
- Pyosalva 43
- Pyradial tablets 201
- Pyramidon color reactions of 312
- coloring of by certain oxidants 171
- microchemical reactions for 223
- therapy side reactions of 196
- Pyrestacin 362
- Pyrethrin I and pyrethrin II relative toxicity of 189
- Pyrethrins action of on marine animals 246
- comparative toxicity of with respect to different classes of animals 342
- Pyrethrum deterioration of 230
- ointment 151
- products new method of analysis of 68
- Pyrocatechol preparation of methylene ester of 112
- α Pyrrol methyl ketone presence of in stabilized of ficial valerian 159 211
- Q
- Quechuo Dominguez malaria treatment with 350
- Quillaja saponin colorimetric test for 16
- Quinaldine acid as a micro reagent I estimation of zinc and its separation from manganese 127
- acid as a micro reagent II estimation of copper and its separation from cadmium manganese nickel cobalt etc 126
- Quinidine new color reaction of and its application to the determination of quinine 17
- and strychnine use of in treatment of premature contractions 196
- specific rotary power of the salts of 277
- sulphate evaluation of use of in persistent auricular fibrillation 92
- toxicity of in guinea pig 87
- Quinine determination of in chocolate tablets 16
- and sodium morrhuate value of in the treatment of varicose veins 351
- aurothiosulphates preparation and properties of 6
- calcium sandoz 43
- distribution of in different parts of central nervous system and their quantitative microdetermination in tissues 241
- effect of on circulatory system 139
- ethylphenylbarbiturate compound 201
- iodobismuthate new method for the quantitative determination of 312
- new color reaction of and its application to the determination of 17
- quantitative determination of in mixtures 315
- quinidine cinchonine and cinchonidine specific rotary power of the salts of 277
- hydroquinidine and hydrocinchonidine toxicity of in guinea pig 87
- tannate behavior of various acids toward 102
- therapy of respiratory diseases by 196
- R
- Rabies experimental in white mice and attempted chemotherapy, 87
- Racefo powder 362
- Racemates and tartrates 7
- Radium and mesothorium use of in treatment of non malignant hemorrhage 350
- Raspberry and strawberry flavors 231
- Rauch-Schnee, 172
- Rectidon 43
- Redoxon, 142
- Red pill (or opium substitute) 223
- sandalwood identification of constituents of pterocarpin from 6
- Reduced iron determination of metallic iron in 167
- iron note on the assay of 14
- Refrigerating agents toxicity of the newer 251
- Reichelt Hustentee 201
- Hustentropfen 201
- Reinecke's blood regenerator 362
- Remedies nostrums and cosmetic agents results of the examinations of 313
- Remonel 265
- Resin determination of rotenone in dennis root and 68
- Resorcinol (fructose) reaction in cerebrospinal fluid 110
- Resyl 151
- Retrorsine action and toxicity of 246
- Revolutionary account book of Christopher Jr and Charles Marshall 135
- Rheumavertin 201
- Rhinitol 205
- Rhubarb cultivation of medicinal 70
- culture of Chinese 205
- investigations on cultivated 2
- Ricinolein solubility of distribution coefficient between neutral glycerides and water of substances soluble in all proportions in two solvents 127
- Rickets peculiar action of phosphorus in treatment of 86
- Risulform 43
- Roba salts 363
- Rocky mountain spotted fever results of ten years prophylactic vaccination 272
- Rogerma 151
- Rose mallow seed oil of 107
- Rosidol 354
- Rossum 37
- use of in alcoholism 351
- Rotenone determination of content of dennis root 120
- determination of in dennis root and resin 68
- Rubiaceae distribution of ipecac alkaloids in the 207
- Rugar 285
- Rugosan concentrate 363
- concentrate with codeine 363
- Russian ergot 173
- Ruthmol 266
- Rynarzol 201
- Ryzamin B 266
- S
- Sabina two cases of intoxication by 342
- Sage oil in perfumery and cosmetics 179
- Sagradol 151
- Saliva tests III detection of the administration of some opium derivatives to horses 339
- Salol and phenacetin fusion curves of 98
- Salt hydrates vapor pressure and dehydration of unstable sodium perborate 205
- Salvia sclarea accumulation of ethereal oil in of Central Asia 279
- Salyrgan, intrapleural injection of 189
- Salzchirler pills 363
- reducing pills 202
- Sandal spike disease of 274
- Sandalwoods structure of some 318
- Sanosin 266
- tablets 363
- Sanotrupp herb extract 363
- Sanovin 202
- Santonin artemisias of Afghanistan producing 313
- determination of in mixtures 17
- β -Santonin properties of 288
- Sapo liquidus Noury 363
- Sapogenins spectrographic observations on various 288
- Saponification number determination of in oils 313
- Saponin solubility of pneumococcus in 272
- Saponus 6
- and sapogenins III sapogenins obtained from chloro galum pomeridianum 53
- Saprophytic ergot cultures alkaloidal content and activity of 270
- Sapucanba oil constituents of 281
- Sarcopitol 266
- Sarcostigma kelum oil of 281
- Sardiman digitalis 21
- Sav-skin 266
- Scarlet fever antitoxin concentration of 46
- fever toxin and antitoxin testing of by the rabbit intradermal method 272

- Schachttox 202
 Scilligeron tablets 202
 Scilloral 202 260
 Sclerosis value of gold salts in disseminated 91
 Scopalamine detection of 13
 distribution of in different parts of central nervous system and their quantitative microdetermination in tissues 241
 Scrophularia species pharmacognosy of the roots and rhizomes of two 318
 Scurvey infantile use of cevitamic acid (ascorbic acid) in the treatment of 34
 Sea sickness remedy bayer ' 196
 Secale dispers 44
 Securodorm 44
 Sedatives types uses and dangers 87
 and hypnotics 246
 Sedilettin wafers 383
 Sedocalcium 202
 Sedonan 303
 Sedospasmod 363
 Sedotyl 363
 Sedozym 151 266
 Selenium distribution of in nature 157
 Senecio alkaloids of 208
 Sensibamine 202
 action of 243
 Separatory funnel 314
 Septicemia value of colloidal copper in 90
 Septicemine 266
 Serum cholesterol effect of nembutal upon of dogs 188
 iron method for the estimation of 116
 Sex hormones female 116
 hormones I hormones of the anterior hypophysis 116
 hormones II estrus producing hormones 292
 hormones review of 116
 Shark liver oil 107
 Shaving cream latherless 70
 creams brushless 326
 soap 328
 Shellac B P C a criticism 25
 Silikat Hautsalbe 202
 Milchpuder 202
 Silver-col 268
 manganite preparations use of in dermatology 196
 mercury complex 275
 nitrate titration of barbitals with 9
 salts use of in pyelonephritis 351
 salarsan use of in the treatment of trichinosis 351
 Simple solution of iodine pharmacopoeial test for 170
 Sinclair's glue 25
 Skatole bacteriostatic action of on gram negative enteric bacilli 272
 Skin creams fatty 75
 creams new bases for 76
 poisons a chapter on Mexican 191
 Smallpox and diphtheria simultaneous immunization against 272
 Snake venom as an analgesic 351
 Soap improving additions to 77
 Soaps some disinfecting 77
 Sodium amide ketone formation with in cinchona alkaloids 99
 amylal detoxification of amidopyrine by 192
 amylal effects of on erythrocyte count following hemorrhage 87
 arabate osmotic pressures of solutions of arabic acid and 156
 bicarbonate incompatibility of magnesium oxide with 180
 bromide experimental study of toxicity of in intra venous injection 139
 chlorate determination of chlorate in 312
 chloride detection of small quantities of bromides in 298
 chloride determination of small quantities of bromides in 62
 cholate preparations quantitative determination of 127
 desoxycholate use of for identification of pneumococci 2
 formaldehyde sulfoxylate value of in mercury poisoning 342
 formaldehyde sulfoxylate 151
 formaldehyde sulfoxylate use of in acute mercury poisoning 192
 hexametaphosphate in skin diseases 351
 hypochlorite easy production of 48
 morrhuate and quinine value of in the treatment of varicose veins 351
 nitrite value of as antidote to hydrogen sulphide 89
 perborate 205
 perborate note on 275
 perborate preparations harmful effects of 343
 phosphate pharmacopoeial test for 170
 propyl methyl-carbonyl allyl barbiturate short acting hypnotic 246
 racemic lactate 266
 salicylate value of in the treatment of some diseases caused by filtrable viruses 351
 thioethanesulphonate metallic derivatives of in therapeutics 247
 thiosulphate determination of available chlorine in hypochlorite solutions by direct titration with 13
 Softol 44
 Solar shields comments on 179
 Soluble chemical products in which iron is associated with vitamin C action of on tumors on intra venous injection 354
 Solucamphor debalante ampuls 44
 Solution of adrenaline (1-1000) practically neutral with good keeping qualities 231
 of aluminum acetate G P VI 314
 of bismuth and ammonium citrate B P C 1934 231
 of iron and ammonium acetate U S P X stabilization of 72
 of methenamine and ammonium chloride 332
 Solutions sterile preparation of 323
 sterilization of for injection 231
 Solvarsin 202
 Solvents for therapeutic substances 181
 Solvachin calcium ampullen 202
 Somnifen poisoning acute 32
 Sophora japonica sophoricoside new heteroside from 283
 Sophoricoside new heteroside from fruits of Sophora japonica 283
 Sorcin sclerosing solution 267
 Soxolade 44
 Specialties necessity of controlling pharmaceutical 27
 and products of research in 1934 196
 newly registered 151
 review of German for 1934 44
 Specific gravity determination of cane sugar content of small volumes of solutions from and specific rotation 10
 rotation determination of cane sugar content of small volumes of solutions from and specific gravity, 10
 Spectroscopic analysis 127
 Spigamum and its therapeutic use 351
 Spinal anesthesia in the rabbit therapeutic coefficients 247
 Spirit of camphor refractometric determination of 314
 of ethyl nitrite preparation and testing of 315
 of turpentine oxidation of 209
 Spiritus Sinapis Swiss Phar V stability of 176
 Splenic capsule effect of drugs on the isolated, of man and other animals 189
 Spot reactions VIII application of to detection of organic compounds 127
 Squill bioassay of powders of 87
 digitalis and strophanthus use of rabbits in assay of 337
 Stabal 202
 Stannobollettes 44
 Staphylococcal affections specific treatment of 352
 Staphylococcus special variety of concerned in food poisoning 97
 Staphylococcus toxin 272
 Staphylococcus toxins and antitoxins 155
 toxin 46 151
 Star anise poisonous species of 319
 Steamer notes on new 23
 Steegenal preparations 363
 Sterile solutions preparation of some 231
 Sterility visible test for 272
 Sterilization notes on 74
 by dry heat at 150° C with special reference to oils 155
 in pharmaceutical practice 97
 in the Swiss Pharmacopoeia V note on an article on 323
 methods in pharmaceutical instruction and operations physiological chemical investigations and 323
 notes 23 232
 of oils note on 155
 remarks on the Swiss Pharmacopoeia V chapter on 323
 Sterol from Pinus sabimana phytochemical notes no 113 109

- Sterol behavior of toward digitonin 224
 from *Momordia fistulosa* phytochemical notes no 111 108
 Stomach and liver preparations as ay of 374
 Stomachetten 44
 Stomachystrum 304
 Bürger 151
 Stone fruit flavors 280
 Stomach sodium 202
 Stramonium constituents of European data culture in China 210
 Streptococci studies on the respiratory mechanism of 68
 Strophanthus treatment of angina pectoris by 100
 g and k identification of by microchemical test 106
 of strophanthus emini 161
 value of in angina pectoris 92
 Strophanthus use of rabbits in as ay of 337
 emini seeds of 173
 hispidus constituents of 107
 Streptococcus effect of altitude on the action of 180
 and barbiturates elimination of 159
 and brucine part XXXIII 277
 and quinine use of in treatment of premature contractions 190
 and quinine quantitative determination of in mixtures 315
 benzoates solubility of some 159
 poisoning of children by 90
 salt micromethod for the identification of 314
 sulphate adsorption of by various charcoal and by Lloyd's reagent 49
 cytoplast, 202
 Sucrose octa acetate compulsory use of as rubbing alcohol denaturant 181
 Sugar companion on reducing sugar methods 17
 and sugar mixtures by hydrocopicity of 53
 in blood volumetric determination of 202
 Sugars chemical methods for reducing comparison of 172
 crystalline structure of part I 281
 sulfamido - 2,4 - diamino azobenzene hydrochloride curative and preventive action of in experimental streptococcus infection 201
 Sulfarsenol in erysipelas 190
 Sulfagen 95 364
 Sulfisocoll 267
 Sulphide analogues of azo dyes having bactericidal properties 345
 sulphocide 267
 sulphur determination of small amounts of in certain organic compounds 68
 in cosmetic preparations 74
 in insulin 291
 oxidation of in organic chemistry application to determination of 68
 sulphurated oil 352
 sunburn preventives 77
 preventives standard for and a method of testing 30
 suppositories note on the preparation of chloral 22
 suppository mold apparatus small scale for pharmaceutical machinery 232
 suprarenal gland treatment of whooping-cough with 352
 surface tensions average value for of essential oils 12
 surgical dressings 81
 dressings criticism of some of the codex standards 224 325
 sweet basil oil 209
 lupines chemical methods for rapid determination of alkaloid content of for breeding 315
 sweetening agents microanalytical studies of synthetic 17
 Swiss Pharmacopoeia practical questions on 133
 Pharmacopoeia remarks on the new 325
 Pharmacopoeia review of 74
 Pharmacopoeia review of the monographs of 74
 yncor suppositories 151
 yncorpan contribution to the pharmacology of 247
 yphilis and malaria investigations in combating 198
 yrup of ferrous iodide 316
 of hydriodic acid U S P X stabilization of 24
 of morphine hydrochloride colorimetric microdetermination of morphine in 168
 yzgium jambolana notes on 71
 determination of nitrates in 15
 determination of quinine in chocolate, 16
 hints and formulae for making on a small scale 324
 me in deviation of functions of correlated observations and of uncorrelated observations as applied to 181
 Tac ch Na of 361
 Tannic acid piene acid in burn 362
 Tannum content of of labiate 21
 difficultly soluble preparation of 93
 esters 258
 in water 52
 Tarrar emetic effects of on the leukocyte count 140
 Tartaric acid new reaction for, 310
 Tartrates and racemates 7
 tea classification of leaves and stems of 108
 Teachers and state board examiners problems of the 136
 Tephrosia vogelii, toxic constituents of seed of 21
 Termpois, use of as an expectorant 352
 Terpenes biogenesis of some 4
 recent progress in the chemistry of 280
 Testicular hormone assay of by the comb growth reaction 339
 hormone crystalline 202
 hormones clarification of constitution of androsterone 110
 Tetanus case of treated with curarine 90
 antitoxin persistence of in man 273
 toxin immunizing activity of in lanolin 98
 toxin photodynamic effect of methylene blue on 98
 treatment of with avertin anesthesia 344
 Tetrachlorethylene determination of in mixtures 18
 Tetrahydronaphthalene peroxide preparation of 7
 Thallioquinone reaction identification of preparations of cinchona by the erythroquinone and 165
 Thallium action of in experimental animals 87
 the detection of alkaloidal reagents VII 172
 two cases of murder by 172
 Theobromine calcium calcium salicylate pills 151
 and caffeine effect of upon digitalis toxicity 191
 Theophylline quantitative determination of in soluble preparations 18
 reaction at site of injection of mercurial diuretics as influenced by 250
 Thevetin cardiac glucoside of Be still nut 108
 Thierry fistule comparison of motor effects of morphine codeine and dilauid on 188
 Thioaurates contribution to physiologic testing of 87
 Thiobarbiturates 353
 Thiobarsone 267
 Thioglycerol solution 1 50 267
 Thrombin new method of preparation of 60
 Thymodronal 44
 Thymol accumulation of in trachyspermum coticum luc 280
 Thymol iodide preparation and properties of 286
 Thymus extracts biological effects of 189
 and pineal extracts biological effects of active 88
 Thyronan pro injectione 364
 Thyroid dispers 44
 Thyroid acetone test for 189
 assay of various preparations of 189
 glands culture of entire 340
 pharmacology of in man 247
 Thyrototoxic action of iodine in 353
 Thyrotropic hormone studies on the of anterior pituitary 112
 Thyroxin point of action of 190
 Tiemann's iron synthesis of 288
 Tin microchemical determination of gold in the presence of 305
 Tincture of ginger strong 232
 of laudanum colorimetric microdetermination of morphine in 168
 of opium determination of morphine in and extract of opium 308
 Tinctures determination of alcohol in 215
 evaluation of made according to six different procedures 73
 of B P C 1934 alcohol content and specific gravities of 324
 Titanium estimation of zinc in presence of 316
 Titration apparatus continuous reading 19
 Tobacco presence of nicotine in 102
 Toddolactone chemical investigation of toddalia aculeata (Pers.) part 2 109
 Tollen's reaction in analysis of medical products 66
 reaction use of in the analysis of medicinal products 316
 Tolu coating U S P X and N F V, value of 133

- Schachttox 202
 Scilergon tablets 202
 Sciloral 202 260
 Sclerosis value of gold salts in disseminated 91
 Scopalamine detection of 13
 distribution of in different parts of central nervous system and their quantitative microdetermination in tissues 241
 Scrophularia species pharmacognosy of the roots and rhizomes of two 318
 Scurvy infantile use of cevitamic acid (ascorbic acid) in the treatment of 34
 Sea sickness remedy bayer 196
 Secale dispers 44
 Securodorm 44
 Sedatives types uses and dangers 87
 and hypnotics 246
 Sedilettin wafers 363
 Sedocalcium 202
 Sedonan 363
 Sedospasmod 363
 Sedotyl 363
 Sedozym 151 266
 Selenium distribution of in nature 157
 Senecio alkaloids of 208
 Sensibamine 202
 action of 243
 Separatory funnel 314
 Septicemia value of colloidal copper in 90
 Septicemine 260
 Serum cholesterol effect of nembutal upon of dogs 188
 iron method for the estimation of 116
 Sex hormones female 116
 hormones I hormones of the anterior hypophysis 116
 hormones II estrus producing hormones 292
 hormones review of 116
 Shark liver oil 107
 Shaving cream latherless 70
 creams brushless 326
 soap 328
 Shellac B P C a criticism 25
 Silikat Hautsalbe 202
 Milchpuder 202
 Silver-col 206
 manganite preparations use of in dermatology 196
 mercury complex 275
 nitrate titration of barbital with 9
 salts use of in pyelonephritis 351
 salvarsan use of in the treatment of trichinosis 351
 Simple solution of iodine pharmacopoeial test for 170
 Sinclair's glue 25
 Skatole bacteriostatic action of on gram negative enteric bacilli 272
 Skin creams fatty 75
 creams new bases for 70
 poisons a chapter on Mexican 191
 Smallpox and diphtheria simultaneous immunization against 272
 Snake venom as an analgesic 351
 Soap improving additions to 77
 Soaps some disinfecting 77
 Sodium amide ketone formation with in cinchona alkaloids 99
 amylal detoxification of amidopyrine by 192
 amylal effects of on erythrocyte count following hemorrhage 87
 arabate osmotic pressures of solutions of arabic acid and 156
 bicarbonate incompatibility of magnesium oxide with 180
 bromide experimental study of toxicity of in intra venous injection 139
 chlorate determination of chlorate in 312
 chloride detection of small quantities of bromides in 298
 chloride determination of small quantities of bromides in 62
 colate preparations quantitative determination of 127
 desoxycholate use of for identification of pneumococci 2
 formaldehyde sulfoxylate value of in mercury poisoning 342
 formaldehyde sulfoxylate 151
 formaldehyde sulfoxylate use of in acute mercury poisoning 192
 hexametaphosphate in skin diseases 351
 hypochlorite easy production of 48
 morphuate and quinine value of in the treatment of varicose veins 351
 nitrite value of as antidote to hydrogen sulphide 89
 perborate 205
 perborate note on 275
 perborate preparations harmful effects of 343
 phosphate pharmacopoeial test for 170
 propyl methyl carbonyl allyl barbiturate short acting hypnotic 246
 racemic lactate 266
 salicylate value of in the treatment of some diseases caused by filtrable viruses 351
 thioethanesulphonate metallic derivatives of in therapeutics 247
 thiosulphate determination of available chlorine in hypochlorite solutions by direct titration with 13
 Softol 44
 Solar shields comments on 179
 Soluble chemical products in which iron is associated with vitamin C action of on tumors on intra venous injection 354
 Solucamphor debalante ampuls 44
 Solution of adrenaline (1-1000) practically neutral with good keeping qualities 231
 of aluminum acetate G P VI 314
 of bismuth and ammonium citrate B P C 1934 231
 of iron and ammonium acetate U S P X stabilization of 72
 of methenamine and ammonium chloride 332
 Solutions sterile preparation of 323
 sterilization of for injection 231
 Solvarsin 202
 Solvents for therapeutic substances 181
 Solvochin calcium ampullen 202
 Somnifen poisoning acute 32
 Sophora japonica sophoricoside new heteroside from 283
 Sophoricoside new heteroside from fruits of Sophora japonica 283
 Sorcin sclerosing solution 287
 Soxolade 44
 Specialties necessity of controlling pharmaceutical and products of research in 1934 196
 newly registered 151
 review of German for 1934 44
 Specific gravity determination of cane sugar content of small volumes of solutions from and specific rotation 10
 rotation determination of cane sugar content of small volumes of solutions from and specific gravity, 10
 Spectroscopic analysis 127
 Spigatum and its therapeutic use 351
 Spinal anesthesia in the rabbit therapeutic coefficients 247
 Spirit of camphor refractodensimetric determination of 314
 of ethyl nitrite preparation and testing of 315
 of turpentine oxidation of 209
 Spiritus Sinsapis Swms Pharr V stability of 176
 Splenic capsule effect of drugs on the isolated of man and other animals 189
 Spot reactions VIII application of to detection of organic compounds 127
 Squill bioassay of powders of 87
 digitalis and strophanthus use of rabbits in assay of 337
 Stabal 202
 Stannobollettes 44
 Staphylococcal affections specific treatment of 352
 Staphylococcus special variety of concerned in food poisoning 97
 Staphylococcus toxin 272
 Staphylococcus toxins and antitoxins 155
 toxoid 46 151
 Star amuse poisonous species of 319
 Steamer notes on new 23
 Steegeeal preparations 363
 Sterile solutions preparation of some 231
 Sterility visible test for 272
 Sterilization notes on 74
 by dry heat at 150° C with special reference to oils 155
 in pharmaceutical practice 97
 in the Swiss Pharmacopoeia V note on an article on 323
 methods in pharmaceutical instruction and operations physiological chemical investigations and 323
 notes 23 232
 of oils note on 155
 remarks on the Swiss Pharmacopoeia V chapter on 323
 Sterol from *Pinus sabiniana* phytochemical notes no 113 109

- Sterols behavior of, toward digitonin 224
from *Monarda fistulosa* phytochemical notes, no
111 108
- Stomach and liver preparations assay of 338
- Stomachletten 44
- Stomachysatum 304
- Bürger 151
- Stone fruit flavors 280
- Stovarsol sodium 202
- Stramonium constituents of European *datura* culti-
vated in China 210
- Streptococci studies on the respiratory mechanism of
98
- Strophanthin treatment of angina pectoris by 198
g and k identification of by microchemical test
128
of strophanthus emini 161
value of in angina pectoris 92
- Strophanthus use of rabbits in assay of 337
emini seeds of 173
hispidus constituents of 107
- Stychnine effect of altitude on the action of 186
and brbiturates elimination of 189
and brucine part XXXIII 277
and quinidine use of in treatment of premature con-
tractions 190
and quinine quantitative determination of in mix-
tures 315
benzoates solubility of some 159
poisoning of children by 90
salts micromethod for the identification of 315
sulphate adsorption of by various charcoal and by
Lloyd's reagent 49
- Styptoplast 202
- Sucrose octa acetate compulsory use of as rubbing
alcohol denaturant 181
- Sugar comparison of reducing sugar methods 17
and sugar mixtures hygroscopicity of 53
in blood volumetric determination of 292
- Sugars chemical methods for reducing comparison
of 172
crystalline structure of part I 284
- 4'-sulfamido 2,4-diamino - azobenzene hydrochloride curative and preventive action of in experi-
mental streptococcus infection 204
- Sulfarsenol in erysipelas 190
- Sulfigen 95 304
- Sulfisocel 267
- Sulphide analogues of azo dyes having bactericidal
properties 345
- Sulphocide 267
- Sulphur determination of small amounts of in certain
organic compounds 68
in cosmetic preparations 74
in insulin 291
oxidation of in organic chemistry application to
determination of 68
- Sulphurated oil 352
- Sunburn preventives 77
preventives standard for and a method of testing 30
- Suppositories note on the preparation of chloral 22
- Suppository mold apparatus small scale for pharma-
ceutical machinery 232
- Suprarenal gland treatment of whooping-cough with
352
- Surface tensions average value for of essential oils 12
- Surgical dressings 81
dressings criticism of some of the codex standards
224 325
- Sweet basil oil 209
lupines chemical methods for rapid determination
of alkaloid content of for breeding 315
- Sweetening agents microanalytical studies of syn-
thetic 17
- Swiss Pharmacopoeia practical questions on 133
Pharmacopoeia remarks on the new 325
Pharmacopoeia, review of 74
Pharmacopoeia review of the monographs of 74
- Syncor suppositories 151
- Syntropan contribution to the pharmacology of 247
- Syphilis and malaria investigations in combating
196
- Syrup of ferrous iodide 316
of hydriodic acid U S P X stabilization of 24
of morphine hydrochloride colorimetric microdeter-
mination of morphine in 188
- Syzgium jambolana notes on 71
- determination of nitrites in 15
determination of quinine in chocolate 16
hints and formulae for making on a small scale 324
mean deviation of functions of correlated observa-
tions and of uncorrelated observations as applied
to 181
- Taesch Nasol 304
- Tannic and picric acid in burns 352
- Tannin content of of labiate 21
difficultly soluble preparation of 93
esters 288
in maté 52
- Tartar emetic effects of on the leucocyte count 140
- Tartaric acid new reaction for, 316
- Tartrates and racemates 7
- Tea classification of leaves and stems of 108
- Teachers and state board examiners problems of the
130
- Tephrosia vogelii toxic constituents of seed of 21
- Termpopsis use of as an expectorant 352
- Terpenes biogenesis of some 4
recent progress in the chemistry of 280
- Testicular hormone assay of by the comb growth
reaction 330
hormone crystalline 292
hormones classification of constitution of androster-
one 116
- Tetanus case of treated with curarine 90
antitoxin persistence of in man 273
toxin immunizing activity of in lanolin 98
toxin photodynamic effect of methylene blue on 98
treatment of with avertin anesthesia 344
- Tetrachlorethylene determination of in mixtures 18
- Tetralydronephthalene peroxide preparation of 7
- Thalleoquinone reaction identification of prepara-
tions of cinchona by the erythroquinone and 165
- Thallium action of in experimental animals 87
the detection of alkaloidal reagents VII 172
two cases of murder by 172
- Theobromine-calcium calcium salicylate pills 151
and caffeine, effect of upon digitalis toxicity 191
- Theophylline quantitative determination of in soluble
preparations 18
reaction at site of injection of mercurial diuretics as
influenced by 250
- Thevetin cardiac glucoside of Be still nut 108
- Thiery fistule comparison of motor effects of mor-
phine codeine and laudaid on 183
- Thioaurates contribution to physiologic testing of
87
- Thiobarbiturates 353
- Thiobisarsen 207
- Thioglycerol solution 1 50 267
- Thrombin new method of preparation of 60
- Thymodonal 44
- Thymol accumulation of in trachyspermum coticum
line 280
- Thymol iodide preparation and properties of 286
- Thymus extracts biological effects of 189
and pineal extracts biological effects of active 88
- Thyranon pro injections 364
- Thyroid-dispers 44
- Thyroid acetonitrile test for 189
assay of various preparations of 189
glands culture of entire 340
pharmacology of in man 247
- Thyrototoxic action of iodine in 353
- Thyrotropic hormone studies on the of anterior
pituitary 112
- Thyroxin point of action of 190
- Tiemann's iron synthesis of 288
- Tin microchemical determination of gold in the pres-
ence of 305
- Tincture of ginger strong 232
of laudanum colorimetric microdetermination of
morphine in 168
of opium determination of morphine in and extract
of opium 308
- Tinctures determination of alcohol in 215
evaluation of made according to six different pro-
cedures 73
of B P C 1934 alcohol content and specific gravities
of 324
- Titanium estimation of zinc in presence of 316
- Titration apparatus continuous reading 19
- Tobacco presence of nicotine in 102
- Toddalolactone chemical investigation of toddalia
aculeata (Pers.) part 2 109
- Tollen's reaction in analysis of medical products 66
reaction use of in the analysis of medicinal products
316
- Tolu coating U S P X and N F V value of 133

- Tolysin elimination of uric acid from rats liver by action of and cinchophen 28
- Tonicum determination of arsenic in 128
katwijk 95
- Tonicum Noury 95 364
N M P. analysis of 128
Waldeheim 364
- Tooth paste 331
pastes children s 77
preparations soaps and soap substitutes in 179
- Tordiol 364
- Toxicity relation of to mode of administration 251
- Toxin X 343
- Toxusan 203
- Trachyspermum copticum line accumulation of thymol in 280
- Tragacanth testing of 129
- Tree barks hygroscopicity of 173
- Triepel suppositories 203
- Trimbethanol anesthesia 343
- Trichlorethylene contribution to the pharmacology of 248
intoxication by 131
study of the anesthetic properties of 340
- Trichophytosis 353
- Trithanolamine detection and determination of 19
- Triglucon 267
- Trilysin 364
- Trisodium periodate and periodic acid preparation of 112
- Tubercle bacilli the production of Koch s phenomenon with various strains of 271
- Tuberculosis antibodies latent 98
- Tung oil iodine value of 129
- Turpentine, chiou 4
- Turtle oil creams 78
- Tussedat 364
drops 151
- Tussipebt tablets 203
- Tutopon 203
- Typhoid fever vaccine effectiveness of in control of typhoid fever 273
prophylaxis efficacy of in United States Army 46
- Typhoral Lilly 151
- Tyronorman 95
- Tyrosine separation of from cystine 129
- U
- Ultraviolet absorption new apparatus for measuring 316
light investigation of the protective effect of various preparations against 340
light qualitative examination of ointments and similar preparations by means of filtered 126
rays vitamin D transformation of highly potent physiological products with 61
- Umbelliferone content of in Persian gum ammoniac 129
- Umbellulone some pharmacological and bactericidal properties of 104
- Unguentolan investigation with 193
- United States patents granted for medicines during the pioneer years of the patent office 238
- Urandil salve 364
- Uranium estimation of zinc in presence of 316
- Urea value of as a diuretic 196
- Ureas relative anesthetic effects of various 248
- Urethanes study of a new series of 7
- Urgamin 203 267
- Uric acid cachets 203
acid elimination of from rats liver by action of cinchophen and tolysin 28
- Urnalysis among the ancients 26
teaching to students of pharmacy 181 182
- Urinary antiseptic 353
gonadotropic factors interrelationships among pituitary and placental 58
- Urnie determination of barbituric acid derivatives in 212
and blood serum determination of indoxyl content of 292
extraction of male sex hormone from 7
hormones from 290
quantitative spectrographic determination of lead in 14
simple method for determination of glucose in 164
- Urine 267
- Uroselectan B ampuls 152
- U S P Revision 25 233
and N F publicity in a retail pharmacy the successful application of 182
- Uterus effect of ergot alkaloids on 85
- Uvaria catocarpa constituents of 285
- V
- Vaccine Dr Aman 95
- Vaginal catarrh powder twega 152
- Vaginitis chronic treatment of with phenylmercuric nitrate 36
- Valerian preparations and valerian root assay of 340
root assay of 340
- Valerian presence of α pyrryl methyl ketone in stabilized 211
alkaloids presence of α pyrryl methyl ketone in stabilized official valerian 159
- Valeriana-dispert 44
- Valvonal 364
- Van der Bergh reaction of bilirubin variations in xanthochromic cerebrospinal fluid 60
- Vanishing creams 78
- Vapor pressure relation of and boiling point to the composition of glycol water mixtures 3
- Variation statistics of drugs contribution to 316
- Vaseline preservation of cherry laurel water and solution of hydrocyanic acid by paraffin oil and 71
- Vaxa 44
- Vegetable extracts and blood sugar 190
lecithin antioxidant properties of 53
oils absorption of ultraviolet light as function of commercial treatment 129
- Vehicles compositions for use as for other substances 237
for medicines study of 25
- Venoms of North American pit vipers studies on 343
- Veratrine alkaloids parts I and II 159
- Verbena officinalis L constituents of 284
- Vermifuge grains of the combretaceae of Madagascar 274
- Vermutrapp-suppositories 203
- Verodigen 267
value of in cardiovascular disease 36
- Veronal and bromural fusion curves of 98
- Vetiver roots from Uganda 22
- Viatol 45
- Vibeta 267
- Vincent s angina preliminary evaluation of a solution of cerous ceric chromate in the treatment of and other oral diseases 353
- Vinethene 36
new hypnotic 354
- Vinococle 364
- Violet odor natural 161
odor natural 280
perfumes 134
- Vionase 152
- Virapaine 268
- Viscophyll 45
- Viscum album L 319
- Viscysate 268
- Visticone syrup 268 365
tablets 268
- Vitamin A absorption of 239
active substances in egg yolk 60
determination of in oils by the spectrophotometric method 129
determination of values by method of single feedings 30
differential reactions between carotene and oils rich in 130
differentiation of from carotene by means of antimony trichloride 130
effects of cottonseed meal on stability of in cod liver oil 116
various methods for determination of 190
- Vitamin and organotherapeutic preparations standardized the question of their unrestricted commerce in the wholesale pharmaceutical trade 335
- Vitamin B 116
relation of in foodstuffs 117
studies of crystalline IV injection method of assay 248
B₁ method for obtaining 117
studies of crystalline II elementary composition and ultraviolet absorption 61
studies of crystalline cleavage of vitamin with sulphite 61
studies of crystalline VIII sulphite cleavage II chemistry of the acidic product 164
- B₂ condition of in cow s milk 61
(lacto flavin) isolation of from hay 58
phosphoric acid synthesis of 61
- Vitamin C comparison of oral and subcutaneous administration of protective doses of 241
and diphteria toxin 155
(ascorbic acid) inactivation of diphteria toxin in

- in vivo* and *in vitro* by crystalline 153
 in bulk 8
 influence of on development of skin sensitivity to
 neoursphenamine in guinea pig 88
 (ascorbic acid) sensitive spot reaction for 118
 titrimetric assay of 19
 Vitamin D absorption of through the skin 197
 content of in salve bases containing cholesterol 1
 absorption through the intestinal mucosa 190
 determination of 190
 transformation of highly potent physiological prod-
 ucts with ultraviolet rays 61
 Vitamin E vestibular function test for deficiency in the
 rat 139
 capsules maltine 152
 standards international 117 191
 synthesis 164
 Vitamins 164
 Vitamins A and D and camphor oil use of in the treat-
 ment of burns 354
 Vitamins B experimental investigations on in their
 relations to glucides proteins and lipids of diet
 60
 history of the discovery of 164
 standardization of report of Second International
 Conference 117
 Volatile oils and aromatics advances in the field of
 in 1933 ketones 102
 Vulvo vaginitis treatment of with oestrin 91

W

- War gases detection of 316
 Water bacteriological control of 47
 sterilization of by a new quartz lamp 232
 Wax paraffin ampuls use of for silver nitrate used in
 prevention of ophthalmia neonatorum 324
 Waxes, acid indices of 214
 heating of and fats 23
 Weiße Wiener Eisenpillen 152
 Wei ling sein studies on 159
 White liniment suggested formula for 78
 mineral oil and petrolatum use of in pharmaceutical
 and cosmetic practice 130

- Whooping-cough control of with serum and vaccine,
 273
 cough immunization against 47
 -cough significance of bacteriological methods of
 diagnosis and control of 47
 Wine effect of cold and freezing storage on the com-
 position of 24
 Witch Hazel (hamamelis) extract and distillate
 history of 80
 Withania obtusifolia V tack and W somnifera dunal
 226
 Wolarin tablets 203

Y

- Yatren sterilization of gauze containing 322
 Yeast extract suggested test for distinguishing be-
 tween and meat extract 14
 Yeasts quantitative determination of biologic value of
 medicinal 30
 Ylang oils classification of commercial 274
 composition of commercial 316
 non modification of the sympatholytic action of
 by the introduction of a double bond 340

Z

- Zephriol new disinfecting agent 37
 Bayer use of in pharmaceutical practice 324
 use of in the preparation of sterile solutions for injec-
 tion 98
 Zinc estimation of and its separation from manganese
 127
 estimation of in presence of iron aluminum ura-
 num beryllium and titanium 316
 microdetermination of by means of anthranilic acid
 317
 oxide and olive oil mixtures of 181
 Zirconium use of *n* propylarsonic acid as a reagent
 for the determination of 16
 Zittmangan 45

